Applicant Exhibit 43

BEFORE
THE OHIO POWER SITING BOARD

In the Matter of the Application of Firelands Wind, LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Wind-Powered Electric Generation Facility in Huron and Erie Counties, Ohio.	)))))	Case No: 18-1607-EL-BGN

DIRECT TESTIMONY OF

Benjamin M. Doyle
Capitol Airspace Group

on behalf of
Firelands Wind, LLC

September 11, 2020

/s/ Christine M.T. Pirik
Christine M.T. Pirik (0029759)
(Counsel of Record)
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1. Please state your name, current title, and business address.

My name is Benjamin M. Doyle. I am the President of Capitol Airspace Group ("Capitol Airspace"), located at 5400 Shawnee Road, Suite 304, Alexandria, VA 22312

2. Please summarize your educational background.

I received an Associate's Degree (1996) in History from Cochise College, Sierra Vista, Arizona. I am also a graduate of the following courses:

- 1994 Air Traffic Control Course, U.S. Army Air Traffic Control School, Fort Rucker, Alabama.
- 1997 Air load Planning Course, U.S. Air Force, Munich, Germany.
- 1997 Primary Leadership Development Course, Non-Commissioned Officer Academy, Grafenwoehr, Germany.

3. Please summarize your professional background.

I have 26 years of aviation experience. I served five years in the U.S. Army where I held two fixed base tower ratings as well as tactical tower and precision approach radar facility ratings. I was responsible for supervising and conducting air traffic control services for both civil and military aircraft operations in the United States, Germany, and Bosnia-Herzegovina. During my time in the Army, I served as an air traffic controller, shift supervisor, training supervisor and tower chief. These positions were held, variously, at Libby Army Airfield, Fort Huachuca, Arizona; Wiesbaden Air Base, Wiesbaden, Germany; and Camp Colt, Bosnia-Herzegovina.

4. What are your current job duties?

As President and Owner, I am responsible for the overall management of Capitol Airspace Group, an aviation consulting firm. Capitol Airspace focuses on providing airspace, obstacle evaluation, and instrument procedures design services to airports and private companies. My resume is attached as Attachment BMD-1

5. On whose behalf are you offering testimony?

I am testifying on behalf of the Applicant in the case, Firelands Wind, LLC ("Applicant" or "Firelands Wind").

6. What is the purpose of your testimony?

The purpose of my testimony is the following:

- Describe the thorough aeronautical study and public comment process undertaken by the Federal Aviation Administrations ("FAA") to determine whether the Firelands Wind Project ("Project") would create a hazard to navigable airspace;
- Describe the determinations of no hazard ("DNH") issued by the FAA regarding the Project, and the implications of the DNHs regarding alleged impacts on navigable airspace within the Project area;
- Explain why alleged concerns are unfounded; and
- Sponsor Exhibit J to the application that was filed by Firelands Wind in this proceeding on January 31, 2019.

My testimony, together with the other witnesses for Firelands testifying in this case, confirms that the Joint Stipulation and Recommendation ("Stipulation"), which was filed in this docket on September 11, 2020, and is being offered in this proceeding as Joint Exhibit 1, supports a finding by the Ohio Power Siting Board ("Board") that the Stipulation should be adopted.

7. In the scope of your position with Capitol Airspace, do you have a working understanding of the FAA's regulations and its process for determining whether a proposed wind turbine creates a hazard to navigable airspace?

Yes. I have been working with the FAA on behalf of clients for the past twenty-one years. My primary focus and the majority of my work has been on the obstacle evaluation process established under the Code of Federal Regulations ("CFR") Title 14 Part 77 and administered by the FAA through its aeronautical study process. In that time, my staff and I have worked in excess of 60,000 7460-1 filings.

8. What does it mean when you say that the FAA issued DNHs for the Firelands Wind Project?

An FAA Determination of No Hazard is a formal decision by the United States Government regarding the impact of a proposed or existing structure on the safety and efficiency of air traffic operations. A DNH is a finding that the structure, at its proposed height and location, will not have a substantial adverse effect on air traffic efficiency.

9. How are the obstruction standards that are defined under 14 CFR Part 77 applied as a part of the FAA's aeronautical study process?

When conducting an aeronautical study, the first step is to determine whether a structure will exceed the height of one or more of the obstruction standards or civil airport imaginary surfaces defined in 14 CFR Part 77. These surfaces are referred to collectively as "Part 77 surfaces." Obstructions standards are contained in 14 CFR 77.17 and civil airport imaginary surface standards are contained in 14 CFR 77.19.

10. Which of the "Part 77 surfaces" did the FAA analyze in issuing its DNHs?

The FAA assessed all of the surfaces defined under 14 CFR Part 77. Of these, the FAA identified that the Emerson Creek Wind Project would exceed the heights defined by four specific surfaces. These four surfaces are defined in 14 CFR 77.17(a)(1) – (4).[1]

[1] § 77.17 Obstruction standards.
(a) An existing object, including a mobile object, is, and a future object would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:
(1) A height of 499 feet AGL [above ground level] at the site of the object.
(2) A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.
(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.
(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

11. Would you explain what each of the four standards means in everyday language?

Exceedance in height of any of these surfaces would result in the FAA identifying the structure as an obstacle which would then warrant further analysis to determine if the structure would pose a hazard to air navigation.

The first two provisions are quite simple. 14 CFR 77.17 (a)(1) specifies that a structure exceeding 499 feet above ground level would be deemed an obstacle. 14 CFR 77.17 (a)(2) establishes a 200 foot above ground level surface within 3 nautical miles of certain airports. This surface extends an additional three nautical miles, in radius, sloping upward at a rate of 100 feet per nautical mile.

The third provision, 14 CFR Part 77.17(a)(3), is a "catch-all' provision that assesses for impact to terminal instrument flight operations. The surfaces that are used to protect instrument flight operations are too numerous to describe here. That said, the application of this standard follows the logic that a structure that would cause a change to instrument flight must be an obstacle.

The last provision, 14 CFR Part 77.17(a)(4), serves the same purpose as the third provision however it is applied to assess for impacts to en-route operations occurring along federal airways or off-route airways. Like the third provision, a structure exceeding a minimum flight altitude for a federal airway would be designated an obstacle.

12. Please describe the standard the FAA uses in applying the obstruction standards.

The FAA has detailed standards for determining whether a structure constitutes an obstruction to air navigation. 14 CFR 77.15(a) defines such an obstruction as one "that may affect the *safe and efficient* use of navigable airspace and the operation of planned or existing air navigation and communication facilities."

It is important to note that this standard does not consider whether a structure simply is an obstruction to navigable airspace, but whether the obstruction may affect the "safe and efficient use of navigable airspace." In fact, 14 CFR 77.15(b) provides that "[o]bjects

that are considered obstructions under the [obstruction] standards…are presumed hazards to air navigation *unless further aeronautical study concludes that the object is not a hazard*."

13. Was an Aeronautical Study conducted by the FAA and what were its findings?

Yes, the FAA completed its aeronautical study and issued Determinations of No Hazard on October 24, 2019.

14. Please describe the process used by the FAA in applying this standard.

The FAA conducts an aeronautical study in order to determine if a structure is a hazard to air navigation. At a very high level, the following is a description of the FAA's process in applying this standard. First, if a proposed or existing structure will exceed the notification standards established under 14 CFR 77.9, the structure's sponsor is required to notify the FAA by submitting FAA Form 7460-1.[2] One example of these notification standards stipulates that proposed construction in excess of 200 feet or more above ground level must be submitted for aeronautical study. The form contains information that includes the structure's latitude and longitude, elevation above mean sea level, height above ground, and proposed lighting, among other information.

Second, once a technician verifies the information submitted as accurate, a case file is compiled and sent to various FAA offices for review under the direction of an airspace specialist. Each FAA office has a different expertise to contribute to the review and to determine whether the structure would adversely affect its area of responsibility. Every aeronautical study must be reviewed by the following FAA offices: (1) Office of Airports; (2) Technical Operations Services; (3) Frequency Management; (4) Flight Standards; and (5) Flight Procedures.

Additionally, agencies external to the FAA also assess for impact to their operations. These are: (1) Department of the Army; (2) Department of the Air Force; (3) Department

[2] FAA Form 7460-1 Notice of Proposed Construction or Alteration.

of the Navy; (4) Office of the Secretary of Defense (for Wind Turbine Projects); and (5) Department of Homeland Security.

Pilots, air traffic controllers, engineers, and technicians in each of these organizations assess the proposed structure to determine if it will create an impact to their areas of responsibility. The findings for these individual assessments are then sent to the supervising airspace specialist within the FAA's Obstacle Evaluation Group for assessment.

Third, the airspace specialist will review the comments of the various offices as to whether the obstacle may adversely affect the specific office's area of responsibility. If the obstacle is found to cause electromagnetic interference or a change in flight operations, *e.g.*, increase the instrument flight rule ("IFR") altitude or cause a visual flight rule ("VFR") aircraft to fly in a different manner, then the obstacle would then be deemed to have "adverse effect."

Fourth, if an adverse effect is identified, the FAA will issue a "Notice of Presumed Hazard," at which point the structure's sponsor may: (1) accept the height limitations proposed in the notice (or cancel or move the project); or (2) request the FAA to conduct further study of the structure.

Fifth, if the structure's sponsor chooses further study, the FAA will seek comment on that particular structure through a "circularization" process. The process provides a 37-day period in which the public may provide comments. In order to facilitate this public comment period, the FAA will solicit input from "[a]ll known aviation interests such as state, city, and local aviation authorities: airport authorities; various military organizations within the DOD; flying clubs; national, state and local aviation organizations; flight schools; fixed base operators; air taxi, charter flight offices; and other organizations and individuals that demonstrate a specific aeronautical interest such as county judges and city mayors." The FAA will consider public comments made within

this timeframe that have a valid aeronautical basis. Comments filed outside of the timeframe are not considered.

Sixth, in making its final determination, the FAA will consider the significance of the adverse effect. As stated previously, the FAA's overriding standard is to ensure the safety and efficient use of navigable airspace. Paramount in making this determination is public safety. In order to ensure that flight operations can be conducted and meet the standards of safety set by the FAA, the agency may opt to alter procedure designs and/or increase minimum altitudes. However, before the FAA decides to alter its operations, it first must determine what impact doing so would have on the efficiency of operations in the area; essentially, how many aircraft operations would be affected by the change. If the number of aircraft operations impacted would exceed a certain threshold, then the FAA will deem the impact to be substantial. In this context, the FAA will determine that a structure is a "hazard" to air navigation only if it concludes that the obstruction will have a "substantial aeronautical impact to air navigation." See 14 CFR 77.31(c). A structure would have a substantial adverse effect if:

- It causes electromagnetic interference to the operation of an air navigation facility or the signal used by aircraft.
- The significant volume of aeronautical operations would be affected by the structure.

15. Please describe the first four steps of the FAA process and the FAA's initial findings described in its Notice of Presumed Hazard.

Firelands Wind filed Form 7460-1 to initiate the FAA study because the height of each proposed turbine would exceed 200 feet in height. The FAA conducted the initial portion of its aeronautical study and issued its preliminary findings in a Notice of Presumed Hazard. The notice advised that the FAA found that:

(1) The location and height of each of the 87 proposed turbines would exceed 499 feet in height above ground level and would therefore constitute an obstruction to air

navigation under 14 CFR 77.17(a)(1).

(2) The location and height of 18 turbines (T-58, T-60, T-61, T-62, T-63, T-64, T-65, T-66, T-67, T-68, T-69, T-70, T-71, T-79, T-80, T-81, T-82, T-83,) would constitute an obstruction to air navigation by exceeding the height of 14 CFR 77.17(a)(2). The FAA also found that five of the proposed turbines (T-66, T-67, T-68, T-69 and T-71) would be located within the lateral boundaries and would penetrate the aircraft Category D visual flight rules ("VFR") traffic pattern airspace ("TPA") for Runways 10/28 at Willard Airport (8G1).

(3) The location and height of one turbine (T-83) would constitute an obstruction to air navigation by exceeding 14 CFR 77.17(a)(3) for Willard Airport resulting in an increase to the minimum climb gradient for departures during certain weather conditions.

(4) The location and height of 23 turbines (T-50, T-51, T-52, T-53, T-56, T-59, T-60, T-61, T-62, T-63, T-64, T-65, T-66, T-68, T-69, T-70, T-71, T-78, T-79, T-80, T-81, T-82 and T-83) would constitute an obstruction to air navigation resulting in an increase to minimum safe altitudes and minimum vectoring altitudes for Erie-Ottawa International Airport and the Toledo Air Traffic Control Tower/Terminal Radar Approach Control ("ATCT/TRACON") under 14CFR 77.17(a)(4).

16. Do you contest these findings?

No. These findings comply with the technical standards defined under FAA's rules as to what structures would be an obstruction (or have an adverse effect) on air navigation. However, Firelands Wind chose to pursue further study with the FAA under the belief that the turbines would likely not pose a "substantial adverse effect" on air navigation.

17. Please describe the FAA's conclusions regarding its initial findings and subsequent final Determination of No Hazard.

The FAA found that turbines would exceed the four obstructions standards described

earlier in my testimony. Exceedance of these obstructions and a finding of adverse effect does not constitute a hazard to air navigation. Adverse effect combined with an impact to a significant volume of air traffic operations results in a hazard decision. In its Determination of No Hazard the FAA found that none of the 87 proposed turbines would exceed the threshold established for a finding of hazard.

Specifically, the FAA stated that those turbines that would exceed the Category D traffic pattern for Willard airport would not constitute a hazard because "Approach Category D aircraft do not normally use Willard Airport" and that the proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1" (Willard Airport).

Additionally, the FAA found that the impacts of to the Minimum Safe Altitudes ("MSA"), Minimum Vectoring Altitudes ("MVA") and departure climb gradient could be resolved by adjusting those altitudes without impacting a significant volume of operations. It should be noted that MSAs are only used by pilots during emergencies to ensure obstacle clearance. Increasing an MSA does not diminish the safety or the efficiency of operations at an airport. MVAs are solely used by air traffic control facilities as a means to ensure obstacle clearance when issuing instructions to pilots. Air traffic facilities regularly update their MVA charts to accommodate obstacles. The increase to the MVAs in question will have no effect on the safety or efficiency of operations at the airports assessed. Lastly, to mitigate the impact to the identified departure climb gradient, the FAA determined that it would need to increase the climb gradient from 200 feet per nautical mile to 201 feet per nautical mile. Given that the vast majority of aircraft climb at much greater rates, a one foot increase was deemed negligible.

18. Did the FAA identify any other impacts not described above?

Yes. The FAA identified that the proposed turbines will be located within line of sight of multiple FAA radars and within a military training route operated by the U.S. Air Force. The FAA determined that the proposed turbines would be visible to the Mansfield Airport Surveillance Radar (ASR-8), The Cleveland Airport Surveillance Radar (ASR-9) and the

Brecksville, OH Common Air Route Surveillance Radar ("CARSR"). The FAA found that the turbines may cause clutter to the primary signal in the vicinity of the wind farm but concluded that such interference would "not create a substantial adverse impact on their operations at this time."

The FAA also provided that the Air Force determined that the proposed turbines are in a location where "affordable and feasible actions can be taken…to mitigate the project's impacts to the Air Force mission."

19. Did the FAA initiate a "circularization" process contemplated by the fifth step in their review?

Yes. To our knowledge, the FAA received four comments, two of which were received late and therefore were not considered. These comments are not normally made available to the public. However, the Ohio Department of Transportation ("ODOT"), which has access to the FAA's internal Obstruction evaluation – Airport Airspace Analysis ("OEAAA") system, provided some of these comments as part of its February 7, 2020 letter to the Public Utilities Commission.[3] Additionally, the FAA responded to these comments in its Determination of No Hazard.

These comments asserted that the proposed turbines would impact two unidentified public airports, air ambulance operations, aerial applicator operations and generally create problems for air traffic in the area. Additionally, comments were submitted expressing concern regarding the economic impact of the wind turbines.

20. Do you concur with the commenter's allegations?

No. The FAA has appropriately considered impacts to air traffic safety and efficiency. All impacts were clearly identified, assessed, addressed and documented in the FAA's Notice of Presumed Hazard and final Determination of No Hazard. Comments regarding impacts to air ambulance operations and aerial applicator operations fail to consider the non-

[3] Subsequently, ODOT issued a March 10, 2020 letter in which it modified the determination in its February 7, 2020 letter.

standard nature of those type of operations. Since these types of operations occur outside the normal limits of air navigation, a different set of safety standards are applied. The FAA's aeronautical study process recognizes and addresses non-standard and non-regularly occurring operations as inappropriate for consideration under 14 CFR Part 77.

21. Did the FAA consider the public comment it received in the sixth step of its deliberations?

Yes. According to the FAA's determination of No Hazard, the FAA considered the two comments that were submitted within the designated time period for public comment.

22. Did the FAA issue a DNH as a result of its further study?

Yes. The FAA issued a DNH for each of the 87 proposed turbine structures. See Attachment BMD-2. As the basis for its determination that the proposed turbines did not have a significant adverse effect on navigable airspace, the FAA found that the structures would not conflict with airspace required to conduct normal VFR traffic pattern operations, would not have a substantial adverse effect on VFR en route flight operations, and that there were no substantial adverse IFR effects as the affected airspace will be adjusted to mitigate the height of structures.

23. Again, I understand that you are not an attorney, but in the scope of your position with Capitol Airspace, do you have an understanding of ODOT's regulations for determining whether a structure is an obstruction to navigable airspace?

Yes, I have reviewed the provisions of the Ohio Revised Code ("R.C.") and applicable regulations that relate to obstruction standards so that I may compare them to the FAA regulations.

24. Did ODOT undertake a review of this Project and advise Staff of its findings?

Yes. ODOT determined that none of the 87 proposed turbines would impact the six surfaces (clear zone, horizontal, conical, primary, approach or transitional) ODOT is tasked with assessing under R.C. 4561.341.

25. Based upon your review of ODOT's aviation rules, what standard is ODOT required to use in determining if a structure will constitute an obstruction to air navigation?

Counsel has advised me that, under R.C. 4561.341, ODOT is to use the rules adopted under R.C. 4561.32 in making this determination. I have reviewed R.C. 4561.32.

26. Have you reviewed Conditions 39 and 40 of the Stipulation that was filed in this docket on September 11, 2020? Do you think that the conditions are appropriate?

I have reviewed the conditions and do believe that they are acceptable but unnecessary. As to Condition 39, I would note that the Applicant's willingness to provide training sessions for local aviation stakeholders is not required to meet federal aviation regulations or safety standards. With the exception of the one-foot increase to the departure climb gradient at Willard Airport, the only altitude changes that will occur as a result of the planned wind farm will be charted Minimum Safe Altitudes or uncharted Minimum Vectoring Altitudes. Minimum Safe Altitudes have no effect on the efficiency of operations and, by their nature, are safe. Minimum Vectoring Altitudes are used by air traffic controllers and are not published for use by pilots. Based on this, I believe that Condition 39 is unnecessary yet acceptable. Condition 40 merely reiterates the proponent's obligation to comply with provisions that are already federally mandated.

27. Does this conclude your testimony?

Yes. However, I reserve the right to update this testimony to respond to any further testimony, reports, and/or evidence submitted in this case.

CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to these cases. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons below this 11th day of September, 2020.

/s/ Christine M.T. Pirik
Christine M.T. Pirik (0029759)

Counsel/Intervenors via email:

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4812-9787-0516 v6 [59714-18]

Attachment BMD-1

Resume

DICKINSON WRIGHT PLLC

Benjamin M. Doyle
President
Capitol Airspace Group

Capabilities Summary

Twenty-six years of Aviation Experience includes eighteen years of airspace analysis focused on obstruction analysis and terminal instrument procedures. Five years experience supervising and conducting aircraft operations in fixed and tactical military air traffic control facilities in the United States, Germany and Bosnia-Herzegovina. Experience includes tower operations as an active tower controller, training supervisor and Tower Chief at the Wiesbaden Army Airfield Air Traffic Control Tower. Certified as FAA Control Tower Operator (certificate last awarded in 1997).

Experience

2010 to Present
President and Owner, Capitol Airspace Group
Responsible for the overall management of Capitol Airspace Group, an aviation consulting firm focused on providing airspace, obstacle evaluation and instrument procedures design services to airports and private companies.

2009 to 2010

Vice President, Airspace and Obstacle Evaluation
Responsible for JDA Aviation's Airspace and Obstacle Evaluation line of business. Responsibilities included the management of all client projects, technical analysis and airspace mitigation development. Duties included the overall business and fiscal management of the Airspace and Obstacle Evaluation line of business, supporting staff and contractors.

1999 to 2009, Aviation Management Associates, Inc., Alexandria, VA

Director, Airspace Analysis
Responsible for supervising the completion of airspace obstruction studies for client developers, attorneys and architects. Responsibilities include managing all technical and programmatic aspects of Aviation Management's airspace business. These duties require an in-depth knowledge of and experience in air traffic control procedures and air traffic and airspace management.

Airspace
In accordance with Federal Aviation Regulations, provide extensive obstruction analysis of proposed construction throughout the United States. Based on analyses, advise clients on federal filing requirements and file proposed structures which are deemed "obstructions to navigable airspace". Conduct analyses using a host of FAA databases and proprietary airspace models. Responsible for representing client interests during airspace negotiations and appeals with FAA, state and local aviation authorities.

Airspace Models
Responsible for the development and maintenance of all airspace models and tools to support obstacle evaluation and procedure design.

1996 to 1999, 3-58th Aviation Battalion (ATS), U.S. Army, Wiesbaden, Germany

Tower Chief

Responsible for supervising facility operations to ensure compliance with military and FAA rules and regulations. Responsibilities included supervision of shift supervisors and subordinate controllers while ensuring that all controllers remained at a safe and proficient operational level. Additional responsibilities included setting and enforcing policy dealing with air traffic control operations specific to the airfield and coordinating with associated facilities for standard and non-standard operations.

Training Supervisor

Responsible for planning, scheduling, directing, and supervising facility training for all assigned ATC personnel. Responsibilities included developing local course material, training aids and control scenarios to supplement U.S. Army and FAA training programs. Supervised and conducted classroom and self –study training while ensuring trainee position qualification and recommending trainees for facility rating.

Air Traffic Controller

Provided terminal air traffic control services for U.S., German and military operations. Provided IFR, SVFR and VFR control for local and international, fixed and rotary wing flights in class D airspace. Coordinated with Frankfurt approach Control for IFR arrivals, departures and over-flights. Deployed as Air Traffic Controller during operations in Bosnia-Herzegovina.

1994 to 1996, 304th Military Intelligence Battalion, U.S. Army, Fort Huachuca, AZ

Air Traffic Controller

Provided terminal air traffic control services at Libby Army Airfield in support of U.S. Army, Air Force, commercial air carrier and general aviation aircraft. Controlled Air Force and Army pilot training flights consisting of precision and non-precision approaches as well as closed traffic on crossed runways. Controlled a mixture of manned and unmanned aircraft within Class D and Class E airspace. Provided IFR, SVFR and VFR control of local and transient aircraft.

Education

Associates Degree, History, Cochise College, Sierra Vista, AZ, 1996
Air Traffic Control Course, U.S. Army Air Traffic Control School, Fort Rucker, AL, 1994
Air load Planning Course, U.S. Air Force, Munich, Germany, 1997
Primary Leadership Development Course, Non-Commissioned Officer Academy, Grafenwoehr, Germany, 1997

Attachment BMD-2

NHD

DICKINSON WRIGHT PLLC

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11906-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T1
Location:	Bellevue, OH
Latitude:	41-20-13.53N NAD 83
Longitude:	82-47-50.44W
Heights:	716 feet site elevation (SE) 659 feet above ground level (AGL) 1375 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11906-OE.

Signature Control No: 392869057-430570265 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

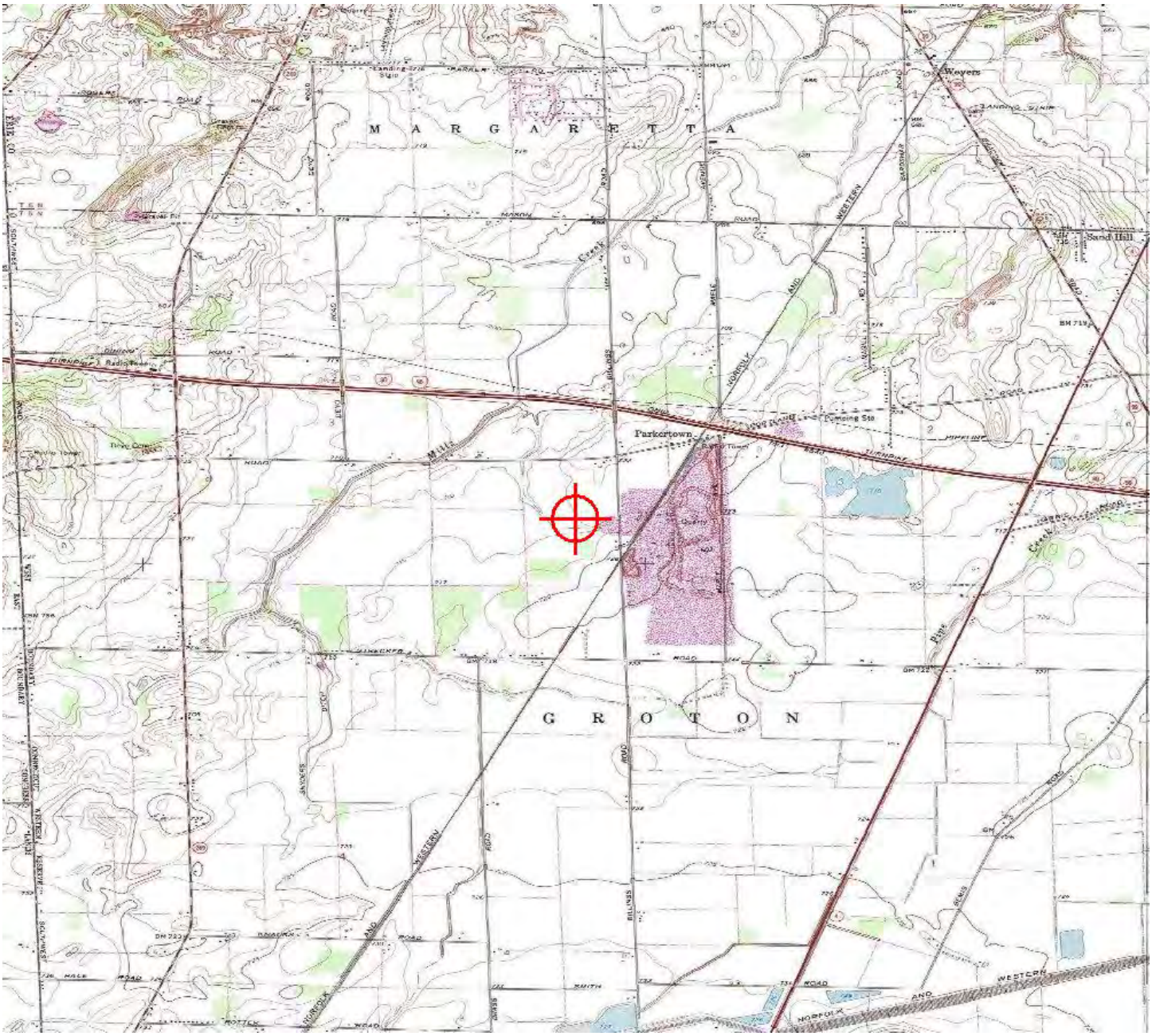
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

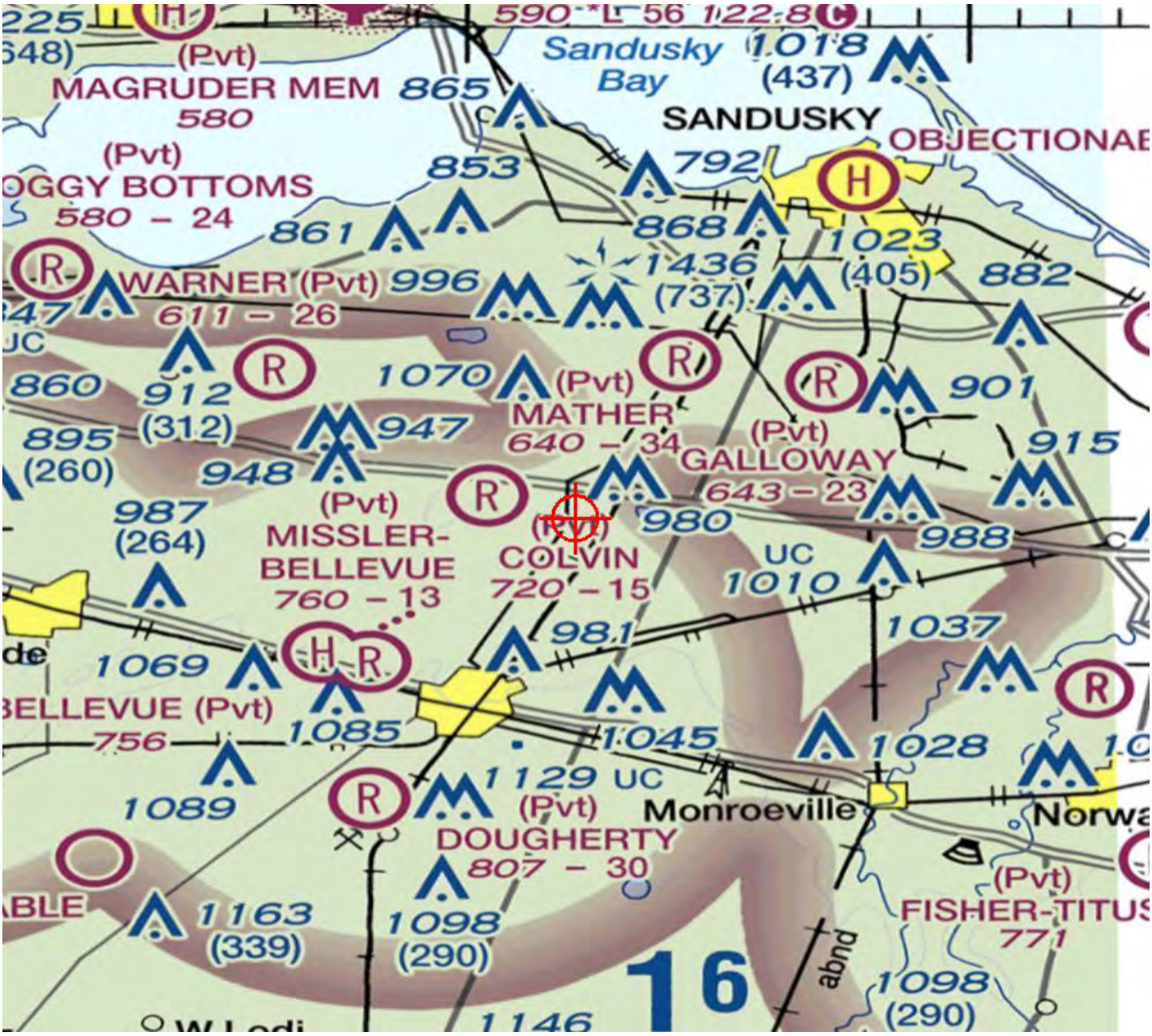
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11906-OE




Sandusky Bay
SANDUSKY
MAGRUDER MEM
580
(Pvt)
OGGY BOTTOMS
580 – 24
WARNER (Pvt)
611 – 26
MATHER
640 – 34
(Pvt)
GALLOWAY
643 – 23
MISSLER-
BELLEVUE
760 – 13
(Pvt)
COLVIN
720 – 15
BELLEVUE (Pvt)
756
DOUGHERTY
807 – 30
(Pvt)
Monroeville
(Pvt)
FISHER-TITUS
771
OBJECTIONAB
UC
1010
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1163
(339)
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16
abnd
1146

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11917-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T2
Location:	Bellevue, OH
Latitude:	41-20-05.46N NAD 83
Longitude:	82-46-13.71W
Heights:	716 feet site elevation (SE) 659 feet above ground level (AGL) 1375 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11917-OE.

Signature Control No: 392869068-430570266 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

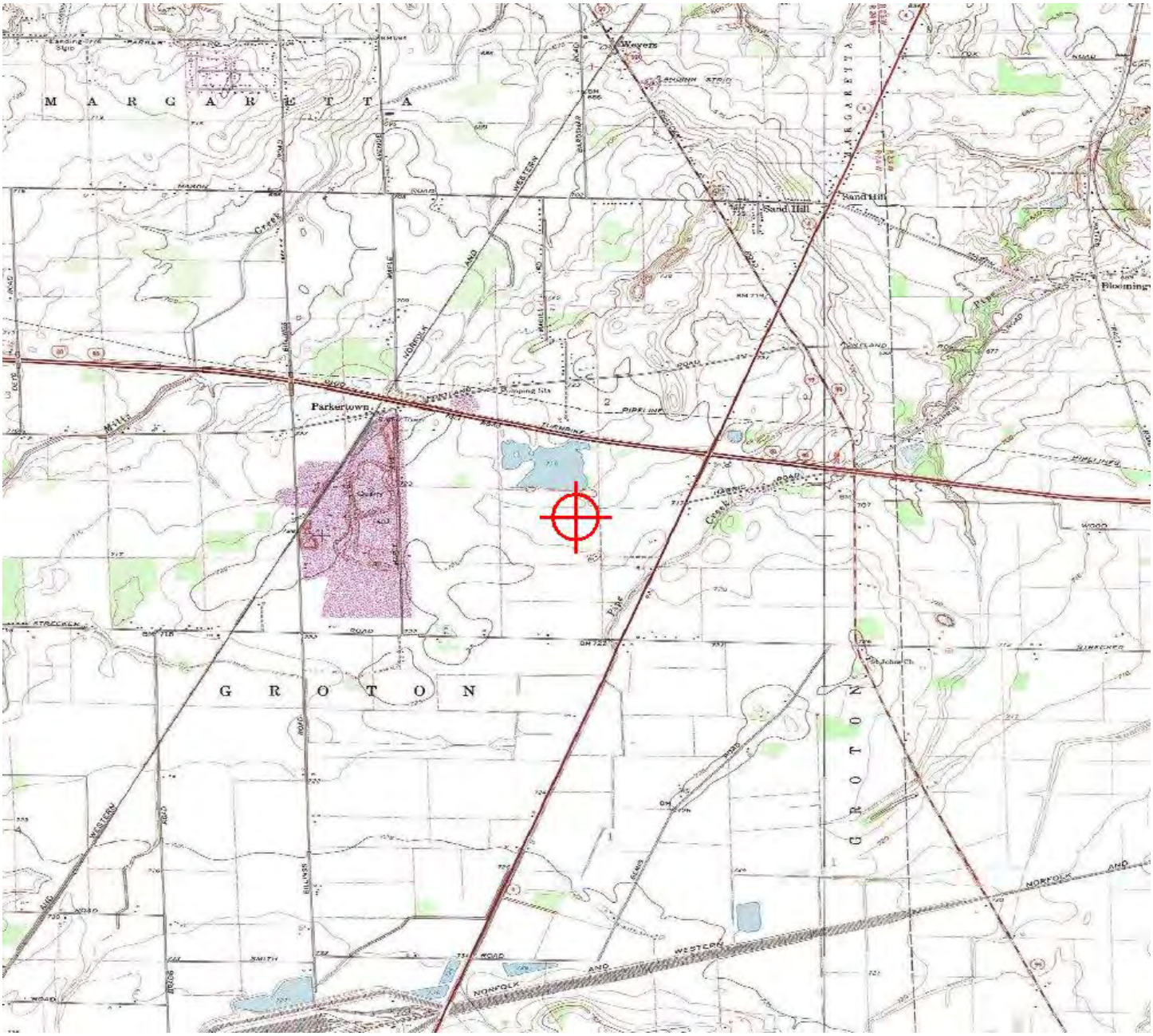
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

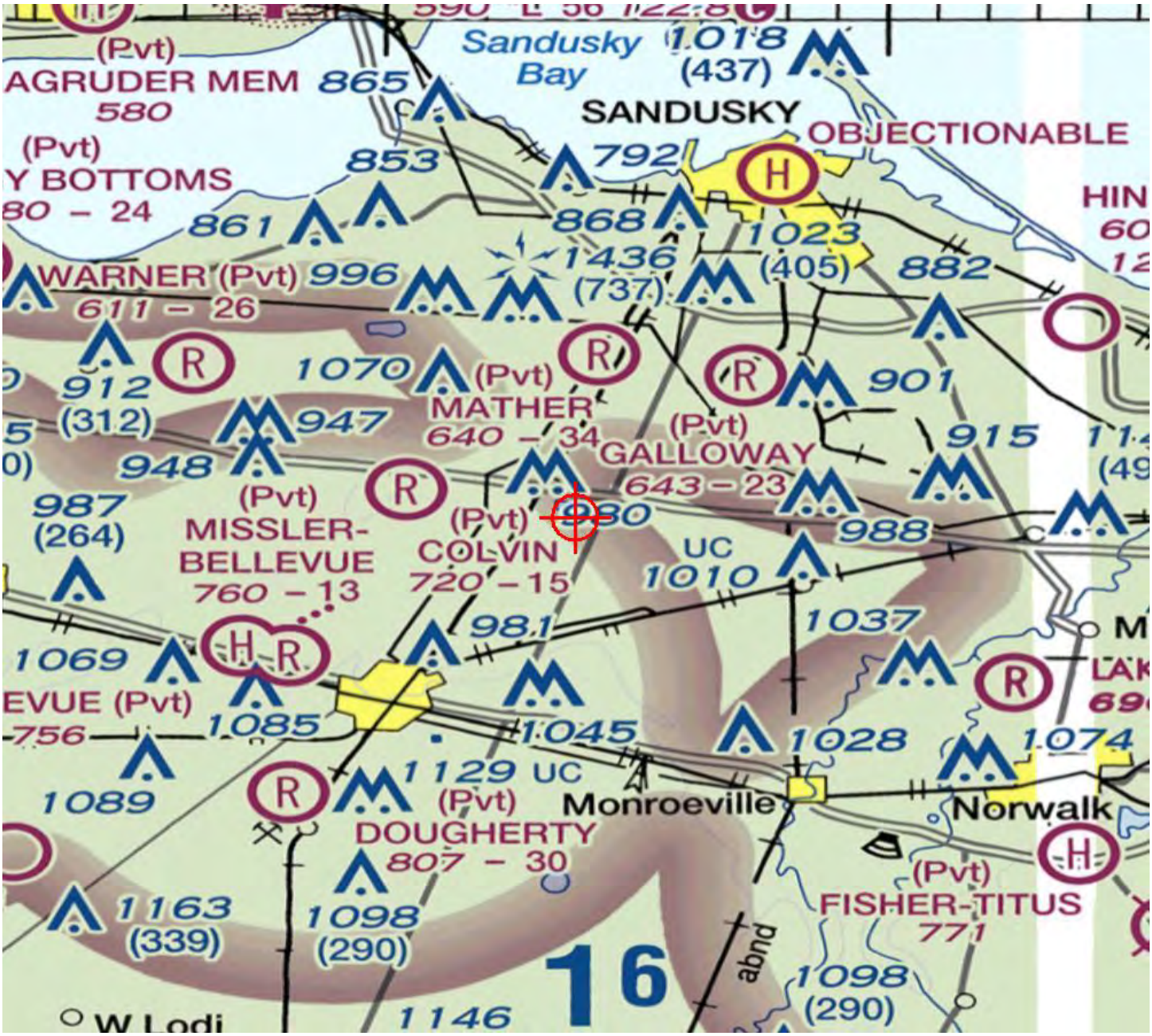
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11917-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11928-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T3
Location:	Bellevue, OH
Latitude:	41-19-53.29N NAD 83
Longitude:	82-41-13.45W
Heights:	692 feet site elevation (SE)
	659 feet above ground level (AGL)
	1351 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11928-OE.

Signature Control No: 392869080-430570476 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

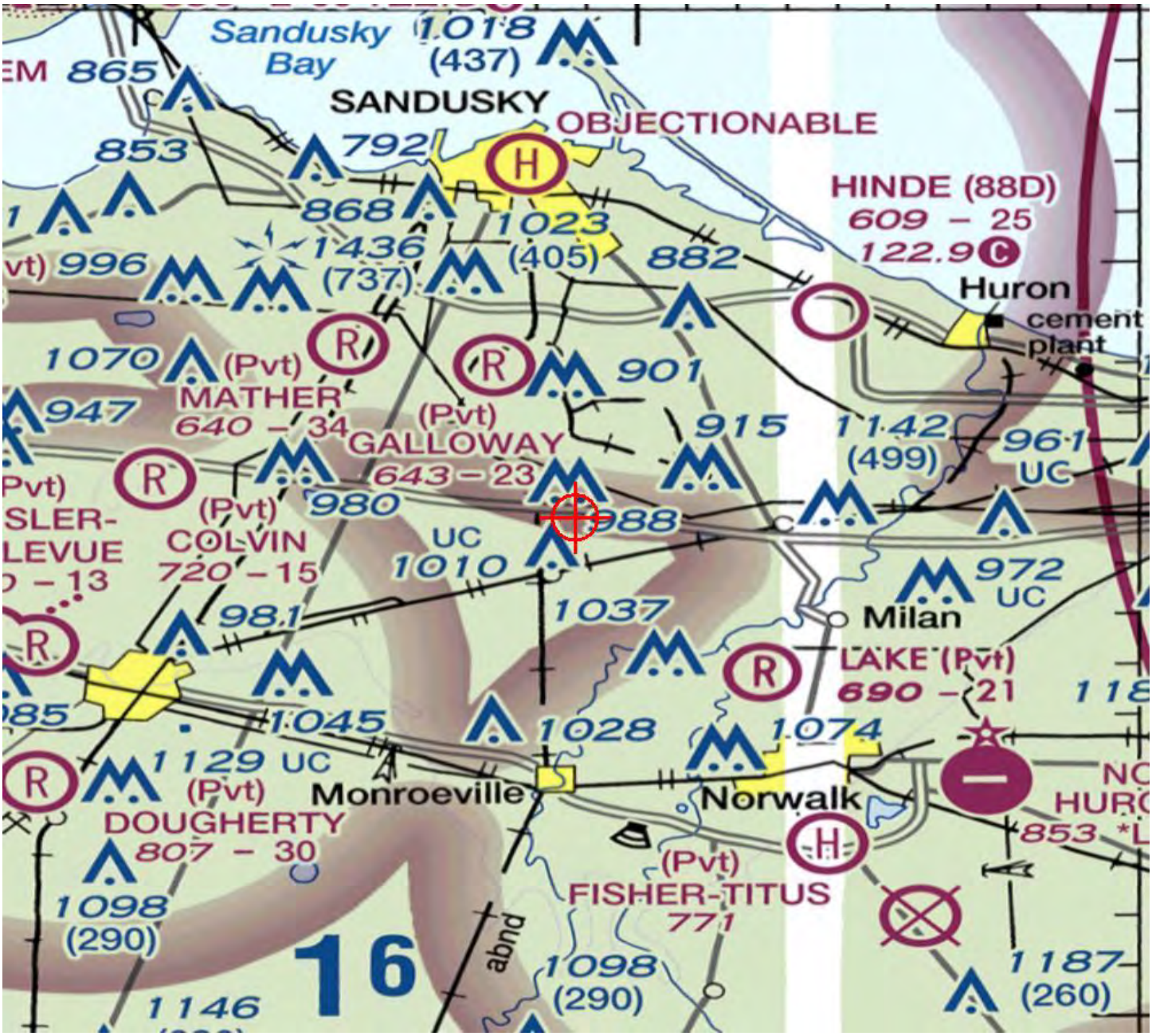
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11928-OE


Sandusky Bay
1018
(437)
SANDUSKY
OBJECTIONABLE
865
853
792
868
1023
(405)
1436
(737)
882
996
HINDE (88D)
609 – 25
122.9
Huron
cement plant
1070
(Pvt)
MATHER
640 – 34
901
947
(Pvt)
GALLOWAY
643 – 23
915
1142
(499)
961
UC
980
988
(Pvt)
COLVIN
720 – 15
UC
1010
972
UC
98.1
1037
Milan
LAKE (Pvt)
690 – 21
1045
1028
1074
1129 UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
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771
1098
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1187
(260)
1146

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11939-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T4
Location:	Bellevue, OH
Latitude:	41-19-39.09N NAD 83
Longitude:	82-41-03.03W
Heights:	688 feet site elevation (SE)
	659 feet above ground level (AGL)
	1347 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11939-OE.

Signature Control No: 392869091-430570584 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

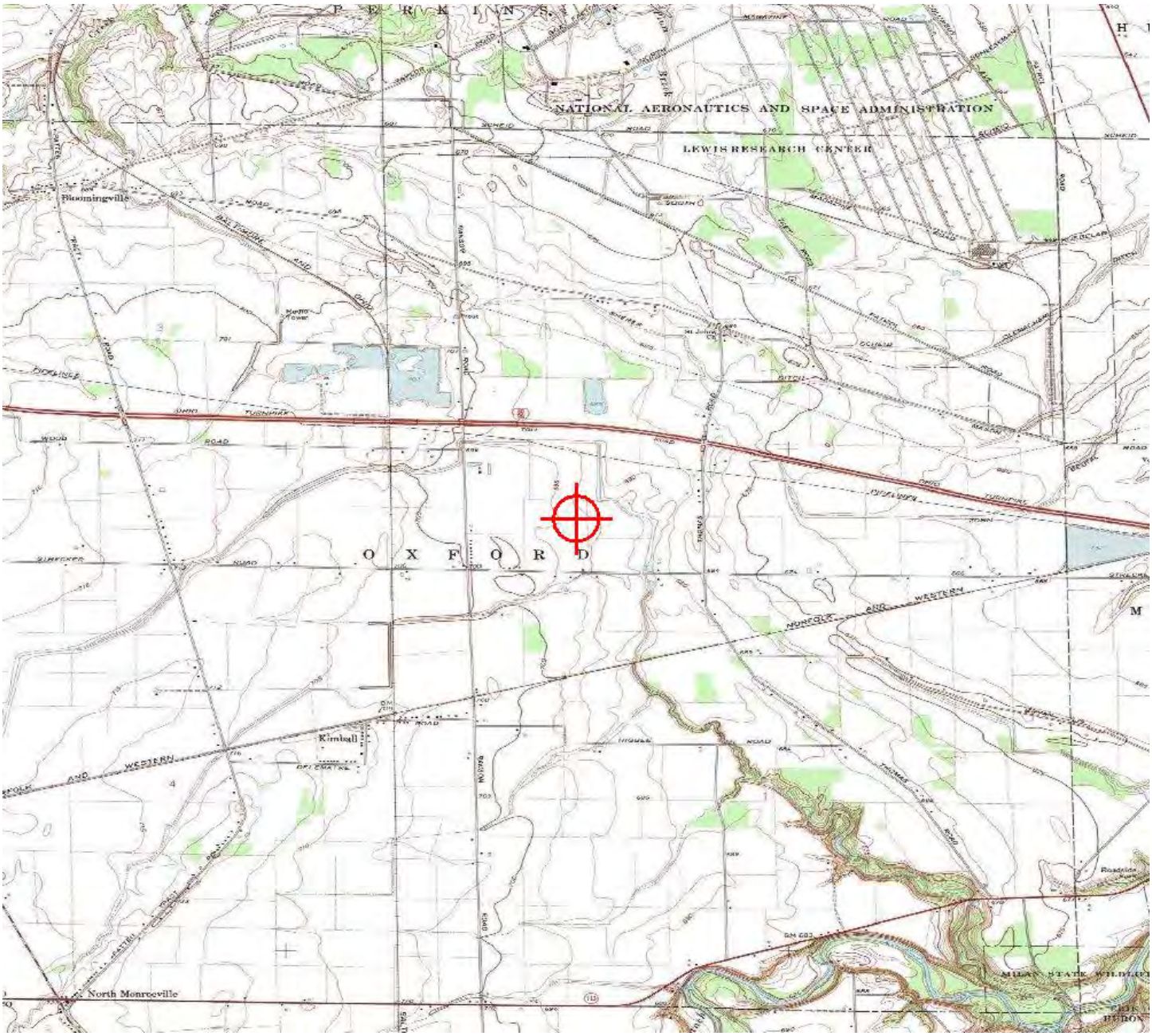
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

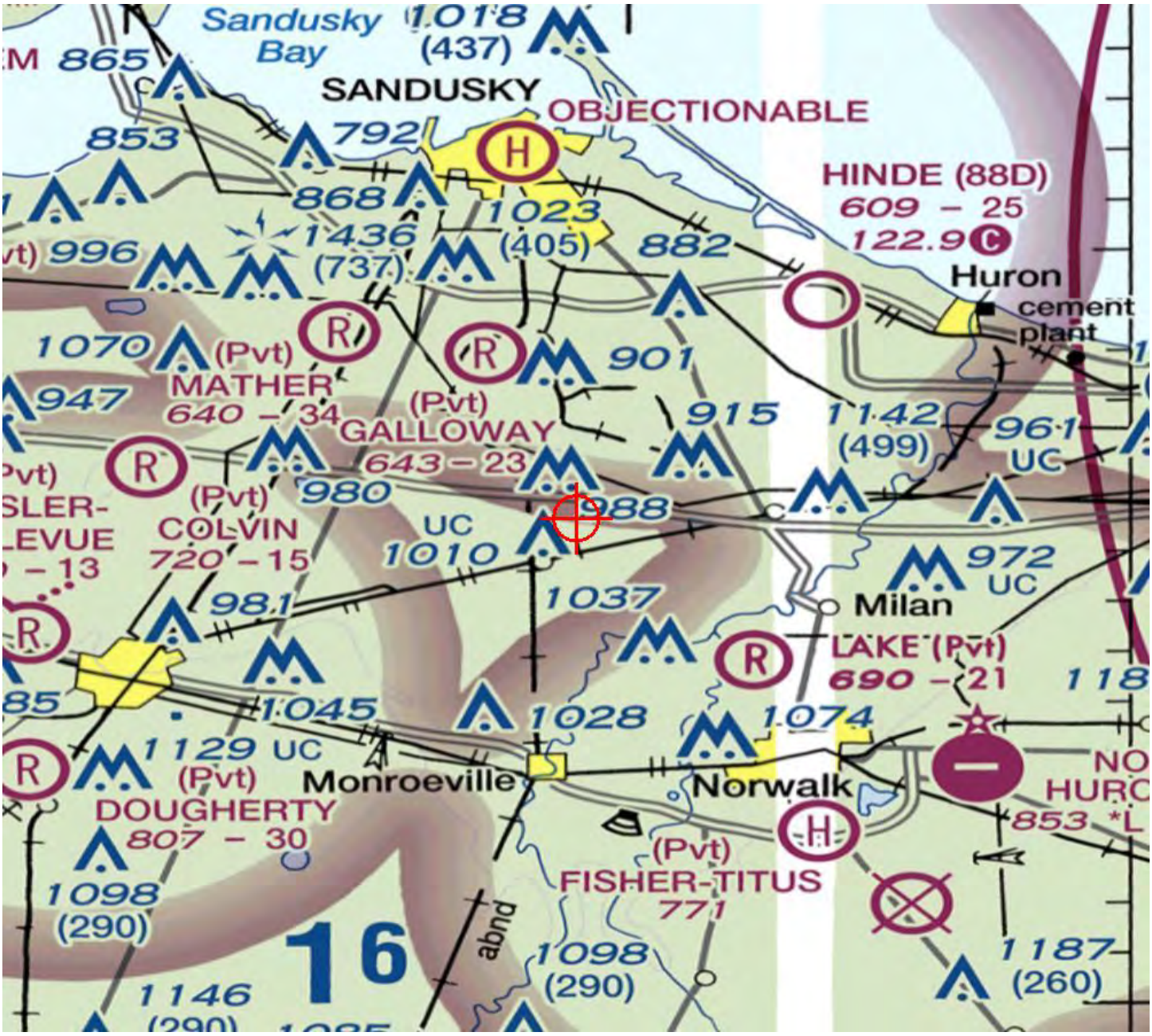
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11939-OE



Sectional Map for ASN 2018-WTE-11939-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11950-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T5
Location:	Bellevue, OH
Latitude:	41-19-38.77N NAD 83
Longitude:	82-40-48.16W
Heights:	686 feet site elevation (SE)
	659 feet above ground level (AGL)
	1345 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11950-OE.

Signature Control No: 392869103-430570655 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

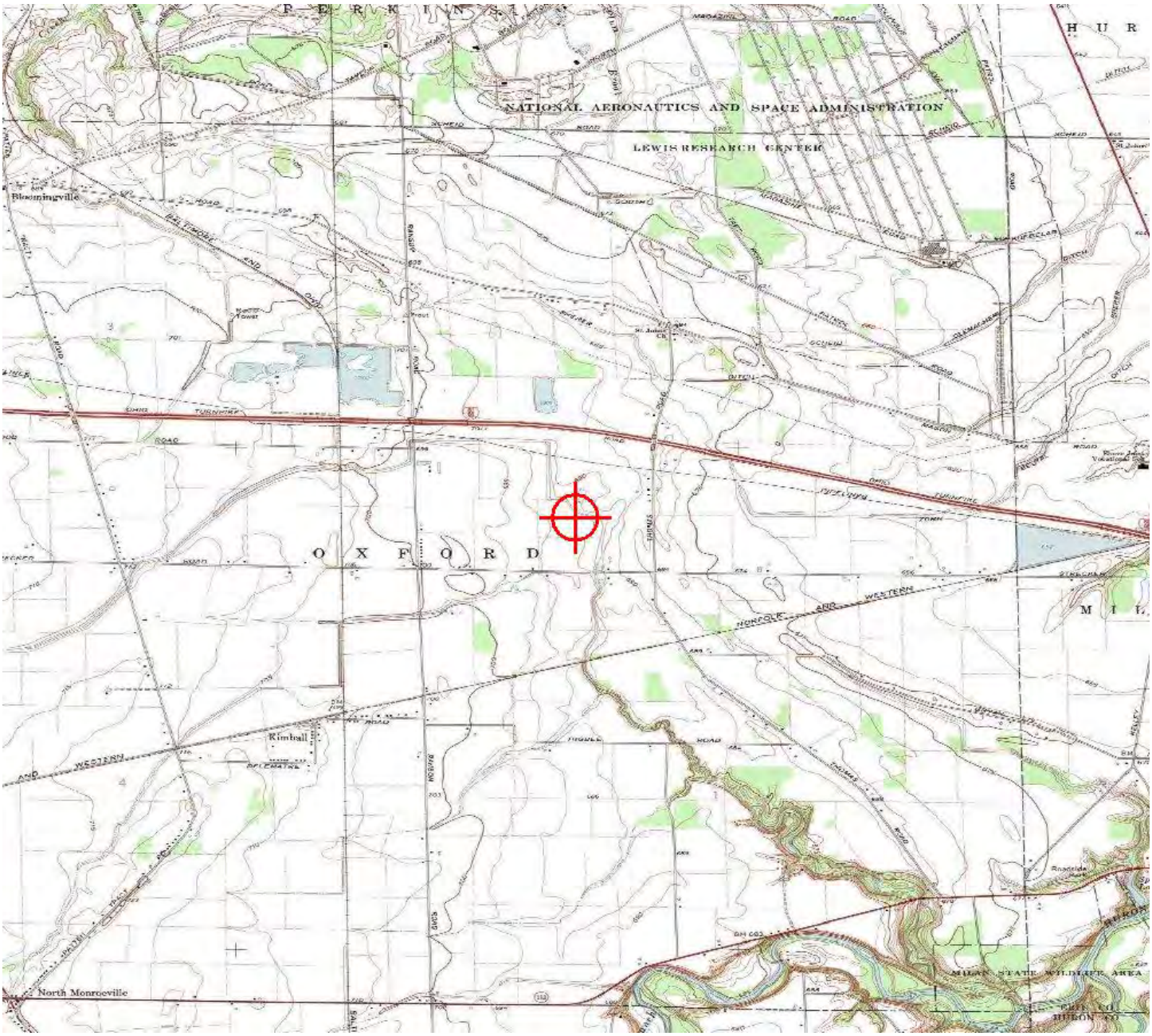
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

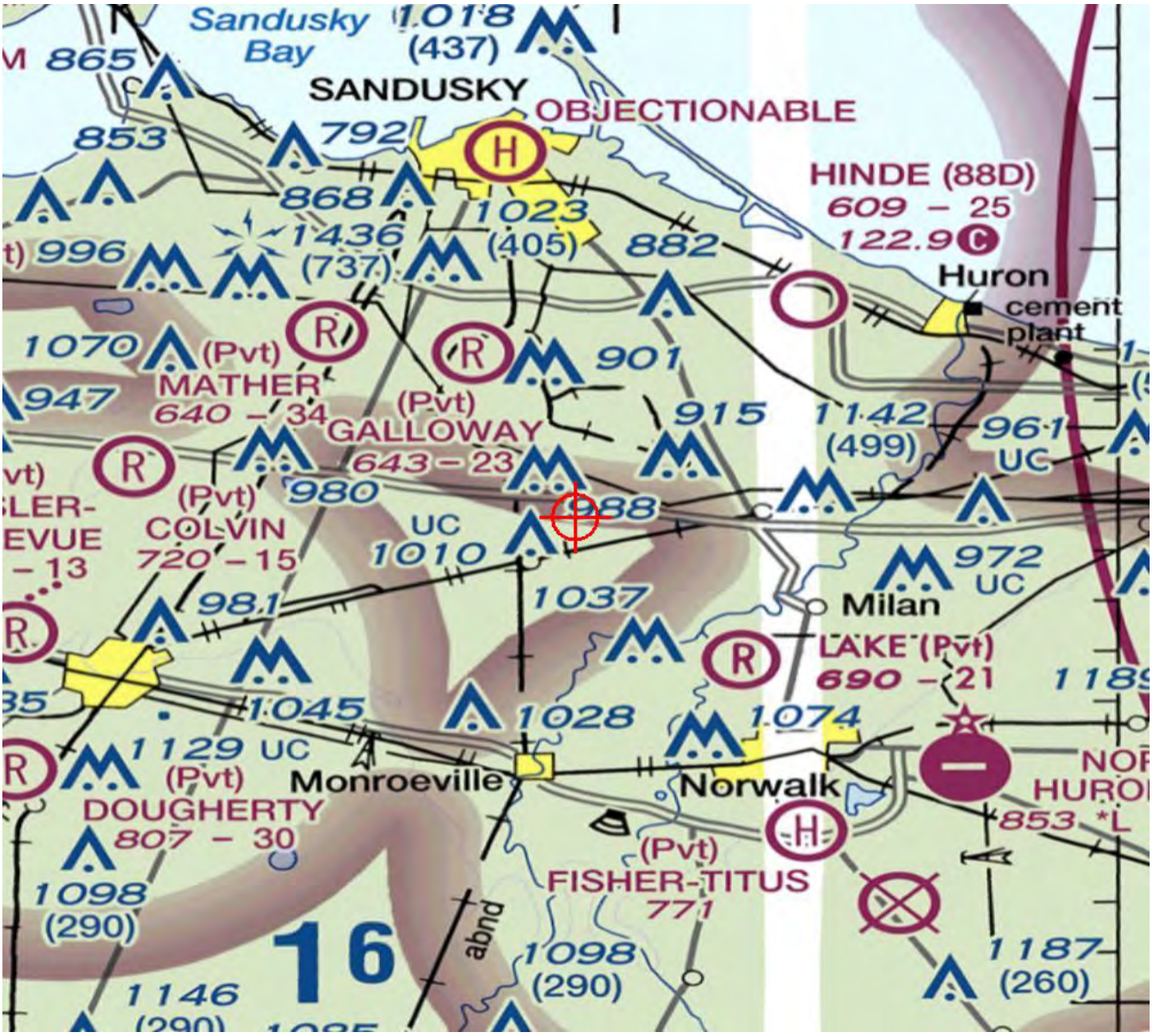
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11950-OE

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792
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609 – 25
122.9
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cement plant
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1070
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640 – 34
947
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GALLOWAY
643 – 23
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Norwalk
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1146

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11961-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T6
Location:	Bellevue, OH
Latitude:	41-19-06.64N NAD 83
Longitude:	82-47-51.79W
Heights:	718 feet site elevation (SE)
	659 feet above ground level (AGL)
	1377 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11961-OE.

Signature Control No: 392869114-430570695 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

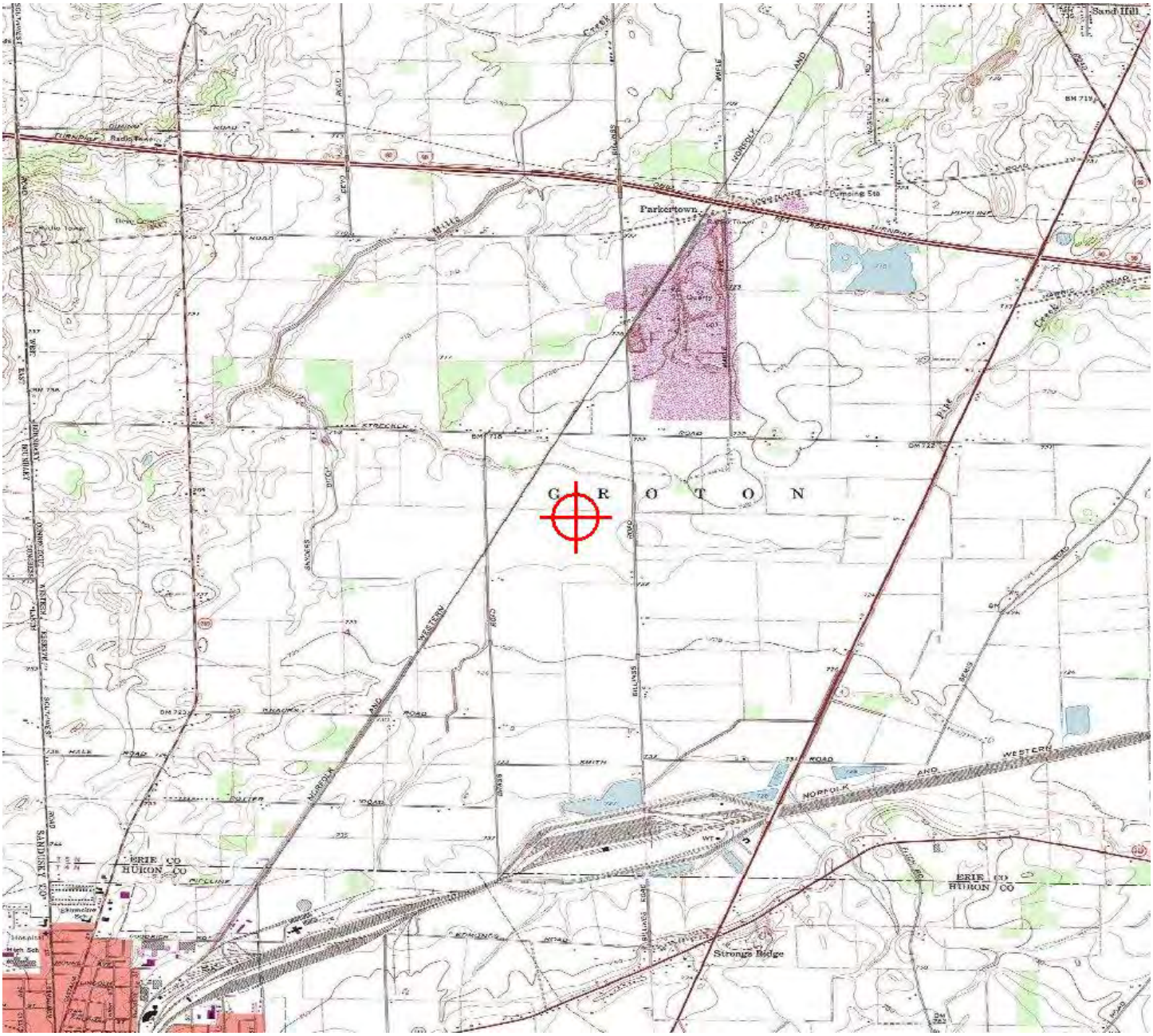
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

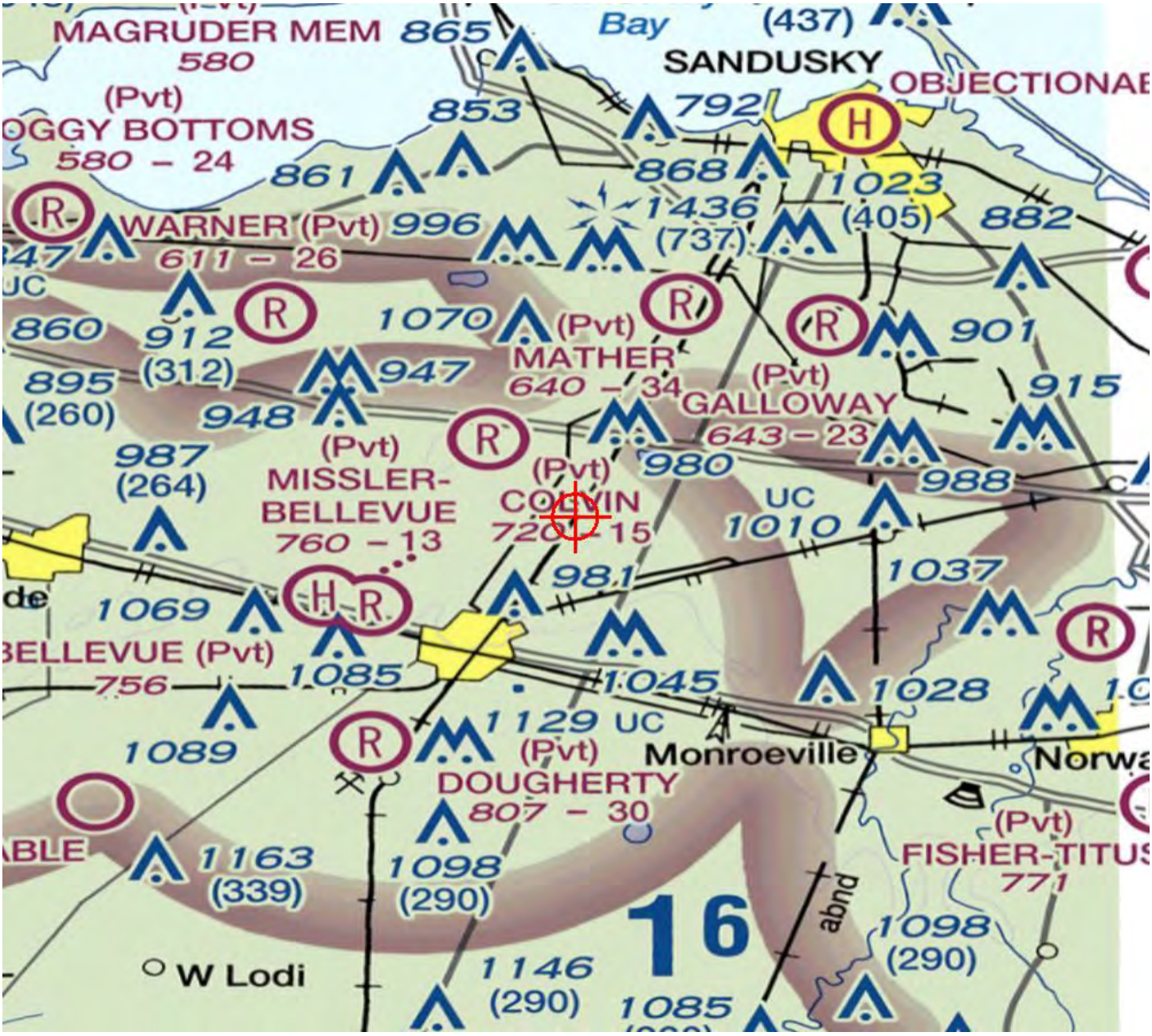
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11961-OE



Sectional Map for ASN 2018-WTE-11961-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11972-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T7
Location:	Bellevue, OH
Latitude:	41-19-04.98N NAD 83
Longitude:	82-46-59.20W
Heights:	722 feet site elevation (SE)
	659 feet above ground level (AGL)
	1381 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11972-OE.

Signature Control No: 392869125-430570701 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

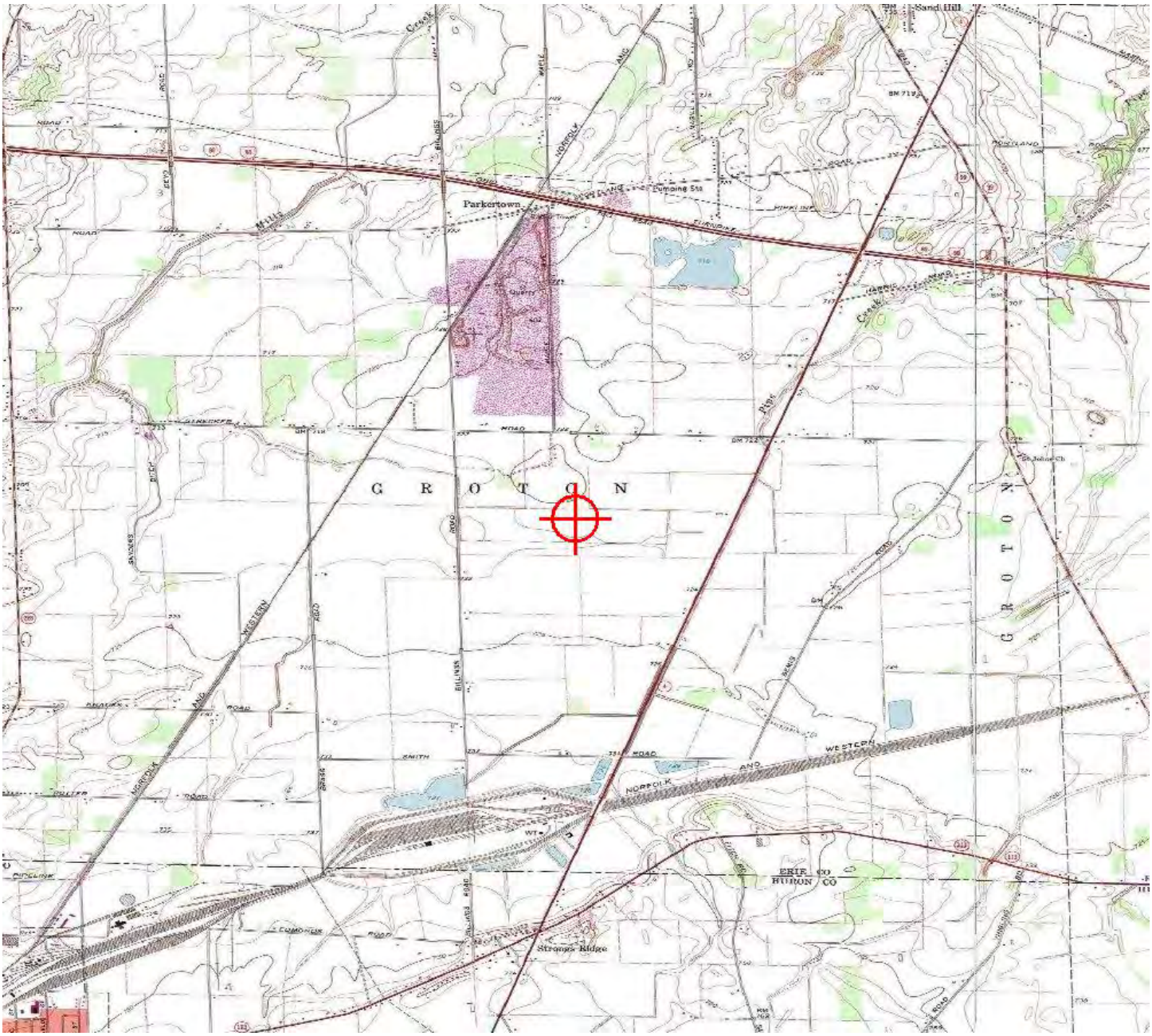
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

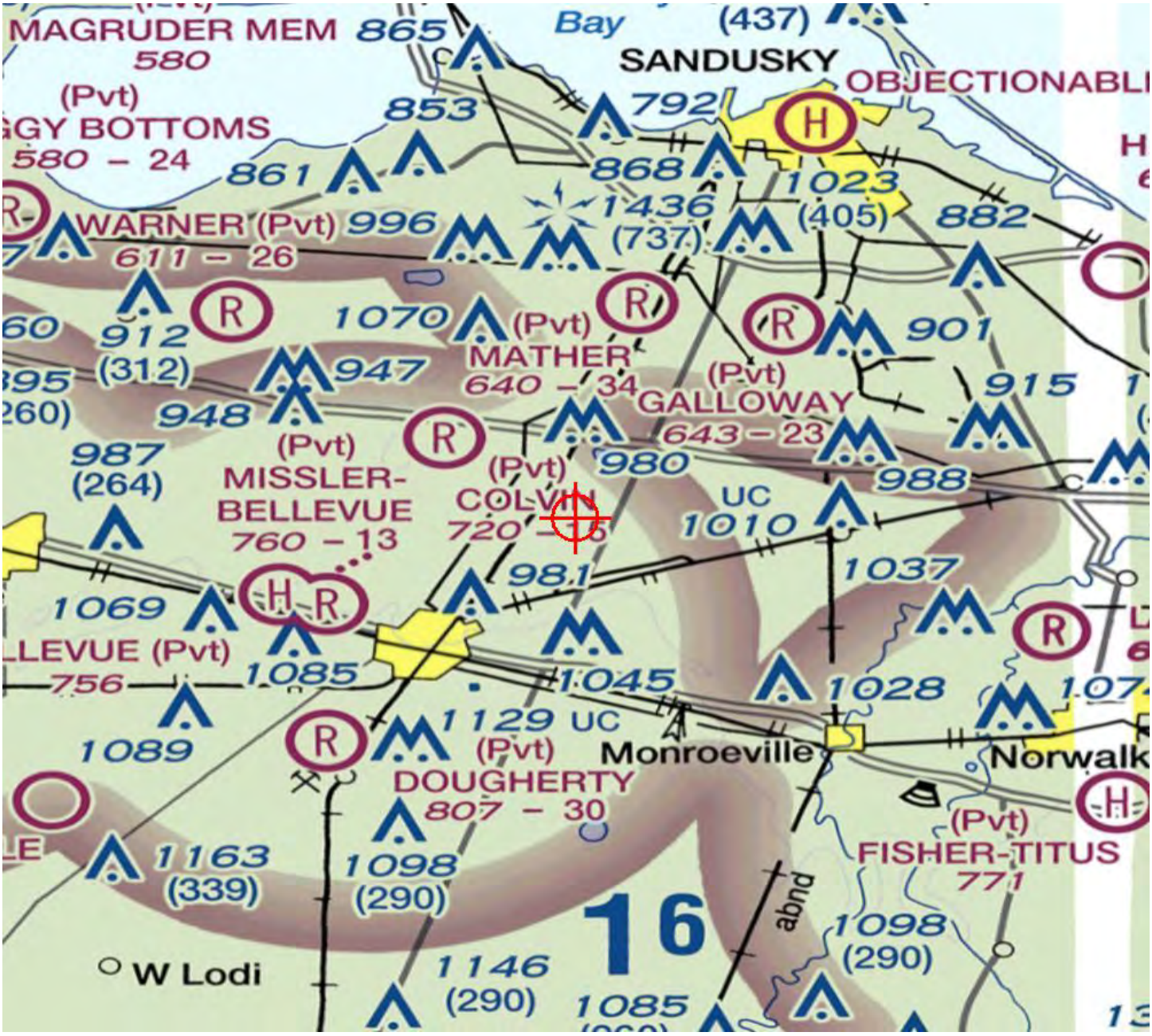
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11972-OE



Sectional Map for ASN 2018-WTE-11972-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11983-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T8
Location:	Bellevue, OH
Latitude:	41-18-59.80N NAD 83
Longitude:	82-46-33.86W
Heights:	718 feet site elevation (SE)
	659 feet above ground level (AGL)
	1377 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11983-OE.

Signature Control No: 392869136-430570724 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

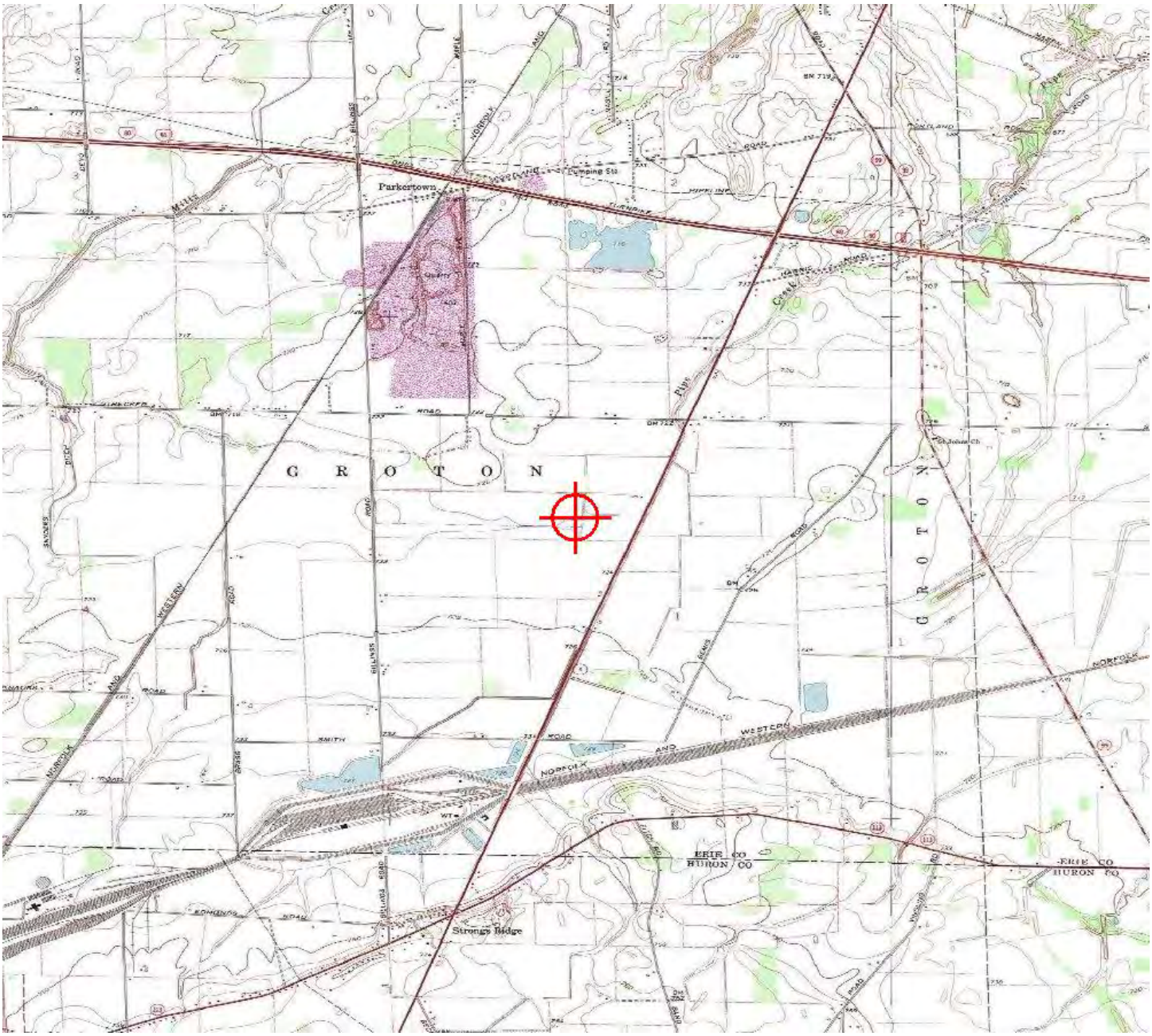
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

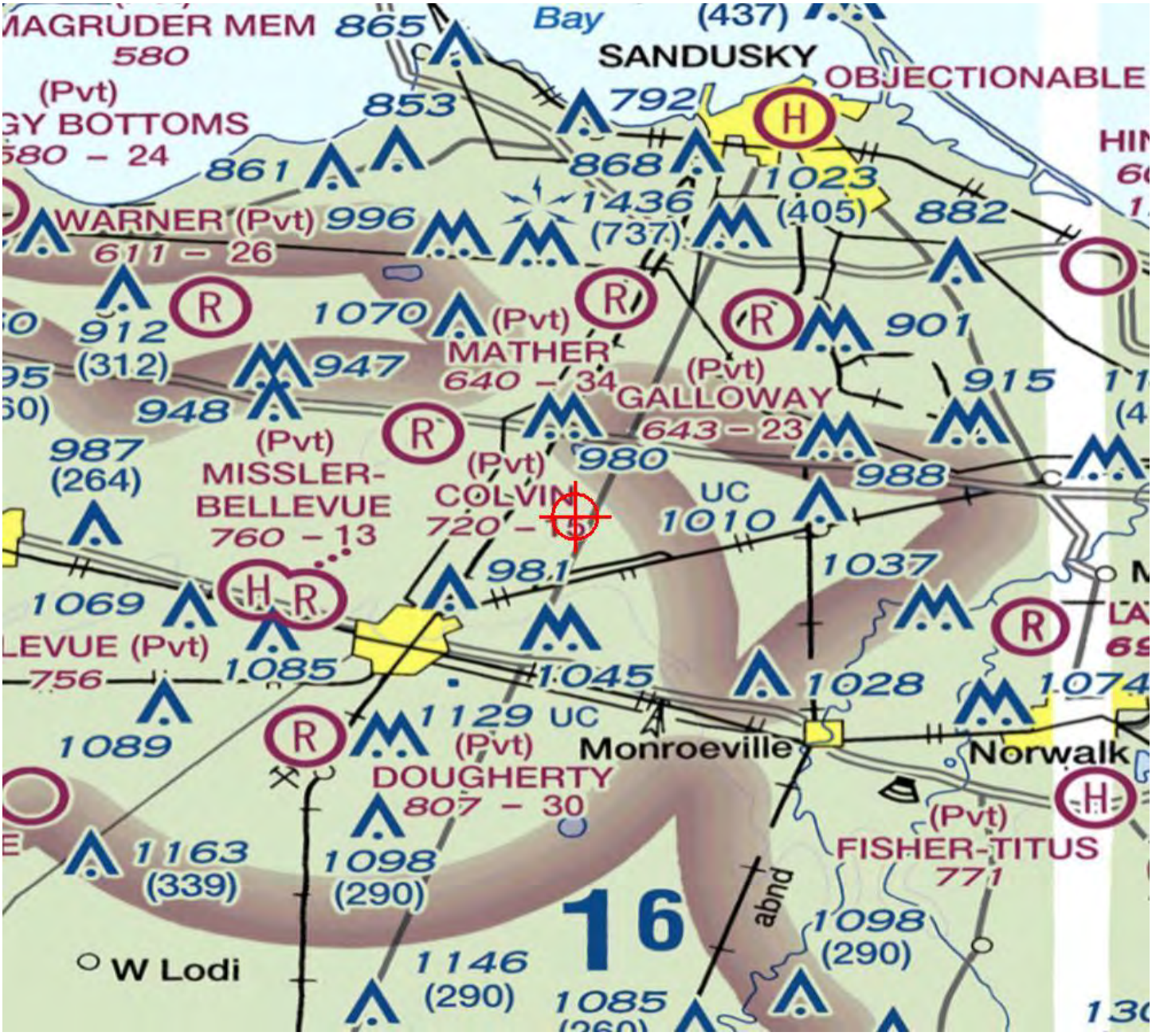
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11983-OE



Sectional Map for ASN 2018-WTE-11983-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11992-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T9
Location:	Bellevue, OH
Latitude:	41-18-50.99N NAD 83
Longitude:	82-47-16.55W
Heights:	720 feet site elevation (SE)
	659 feet above ground level (AGL)
	1379 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11992-OE.

Signature Control No: 392869145-430570778 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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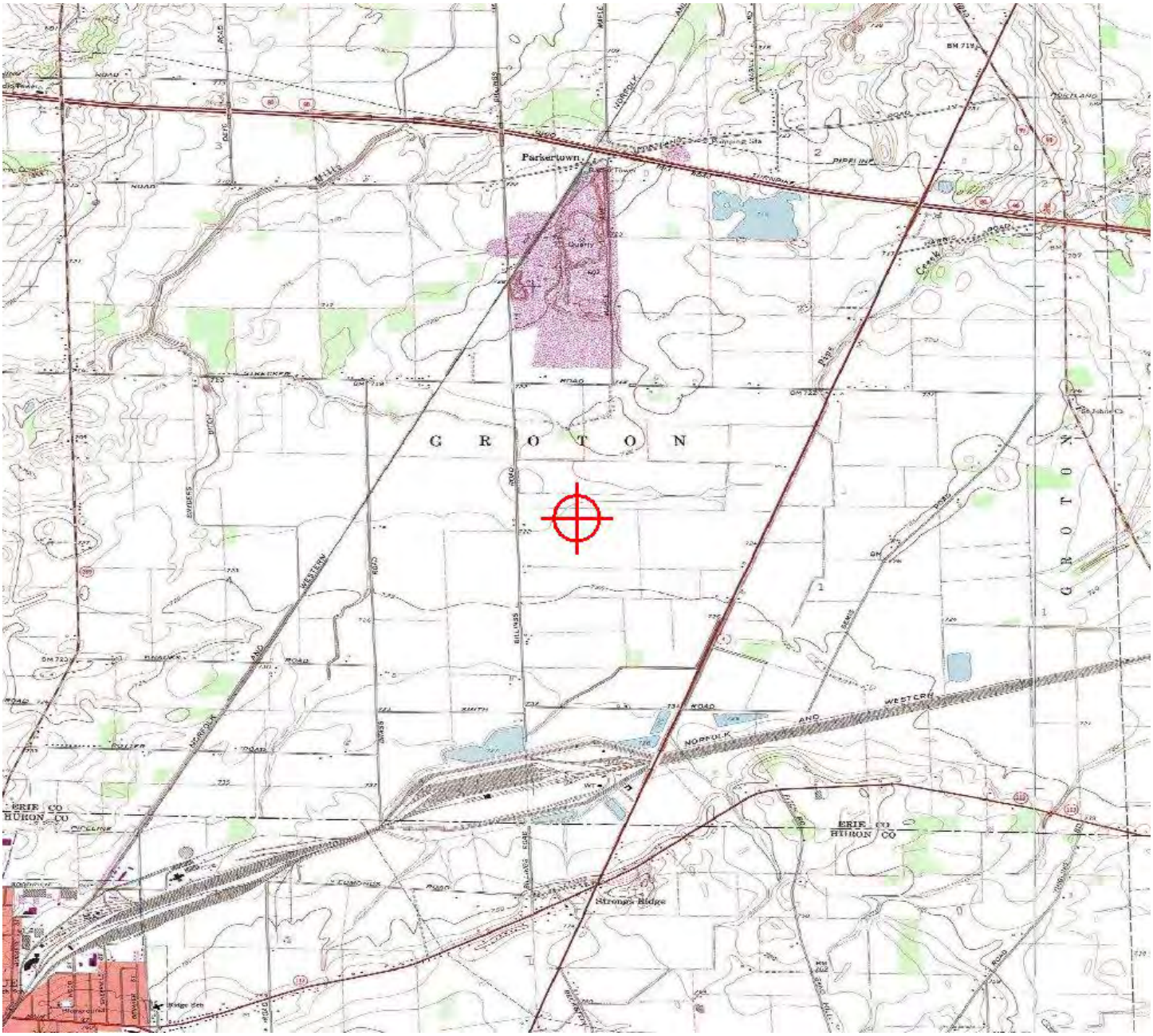
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

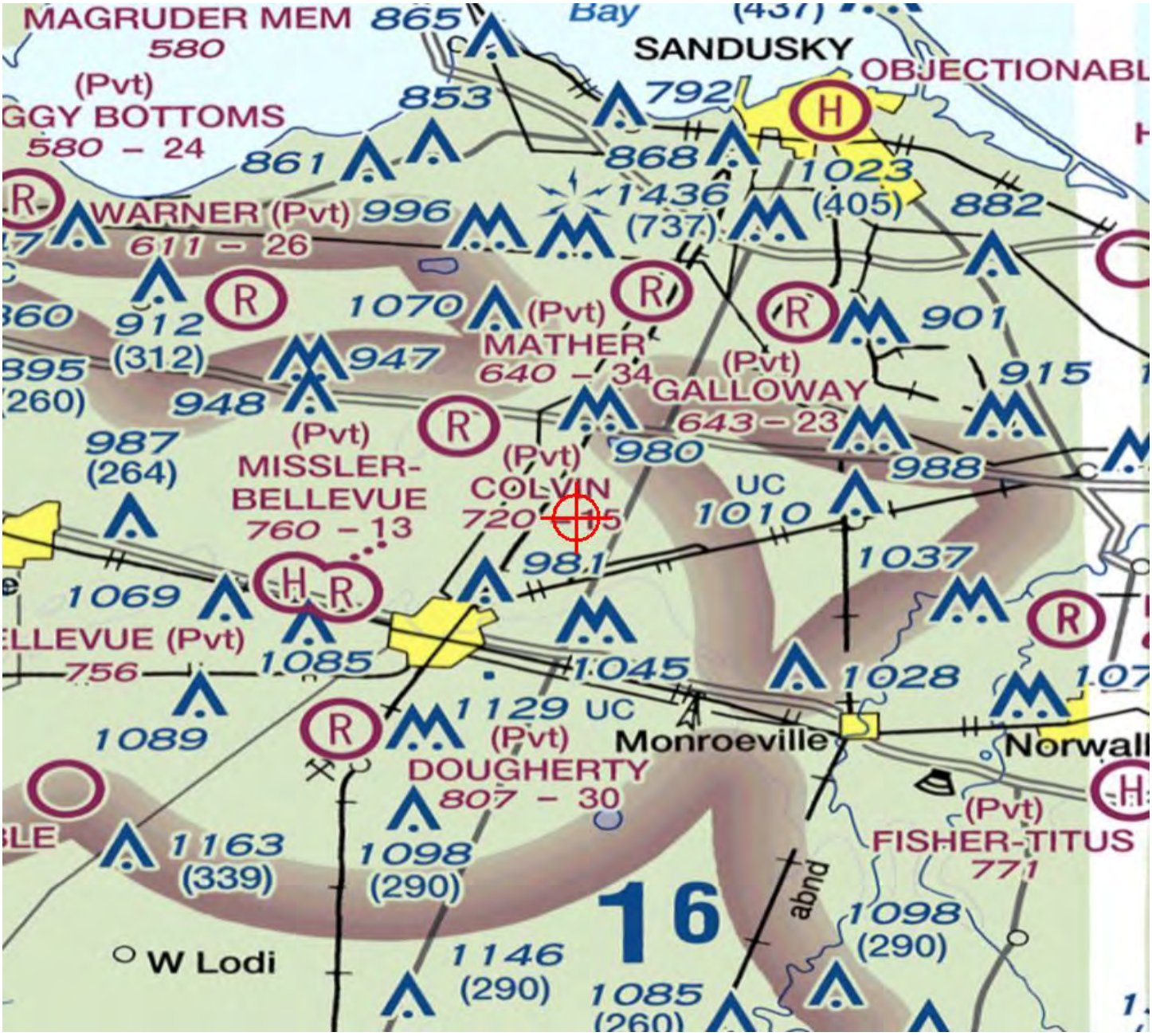
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11992-OE




MAGRUDER MEM
580
(Pvt)
GGY BOTTOMS
580 – 24
WARNER (Pvt)
611 – 26
MATHER (Pvt)
640 – 34
GALLOWAY (Pvt)
643 – 23
MISSLER-BELLEVUE (Pvt)
760 – 13
COLVIN (Pvt)
720 – 15
DOUGHERTY (Pvt)
807 – 30
FISHER-TITUS (Pvt)
771
SANDUSKY
OBJECTIONABL
Monroeville
Norwall
W Lodi
UC
abnd
16
865
853
792
861
868
1023
(405)
1436
(737)
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901
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11907-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T10
Location:	Bellevue, OH
Latitude:	41-18-40.69N NAD 83
Longitude:	82-47-05.49W
Heights:	720 feet site elevation (SE)
	659 feet above ground level (AGL)
	1379 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11907-OE.

Signature Control No: 392869058-430570200 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

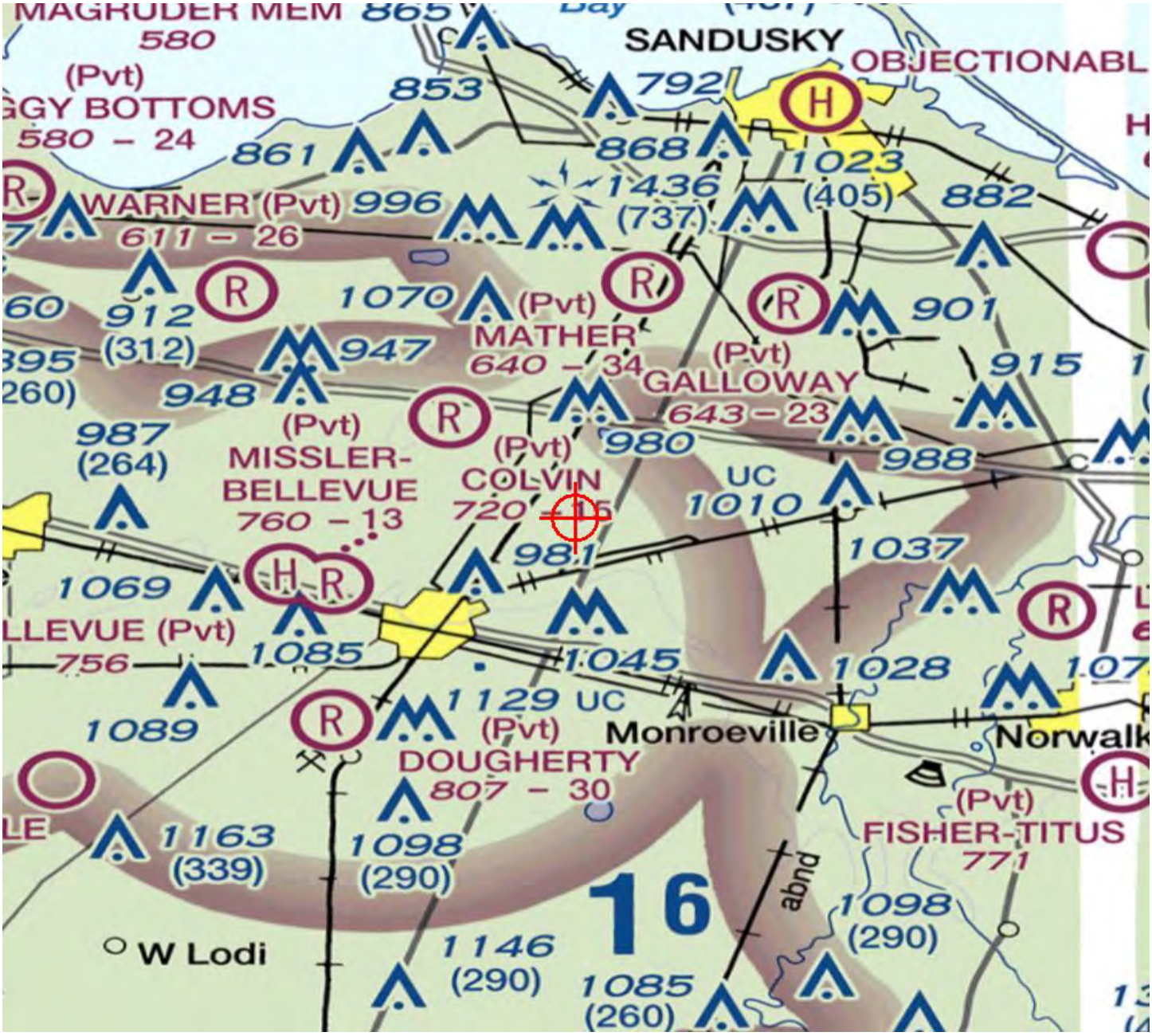
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11907-OE


MAGRUDER MEM
580
(Pvt)
GGY BOTTOMS
580 – 24
SANDUSKY
OBJECTIONABL
853
792
861
868
1023
(405)
1436
(737)
882
WARNER (Pvt)
611 – 26
996
912
(312)
1070
(Pvt)
MATHER
640 – 34
947
948
(Pvt)
MISSLER-
BELLEVUE
760 – 13
901
915
(Pvt)
GALLOWAY
643 – 23
980
988
987
(264)
(Pvt)
COLVIN
720 – 16
UC
1010
981
1037
1069
LLEVUE (Pvt)
756
1085
1045
1028
1129 UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
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Obstruction Evaluation Group
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Aeronautical Study No.
2018-WTE-11908-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T11
Location:	Bellevue, OH
Latitude:	41-18-35.12N NAD 83
Longitude:	82-47-59.11W
Heights:	722 feet site elevation (SE)
	659 feet above ground level (AGL)
	1381 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11908-OE.

Signature Control No: 392869059-430570199 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

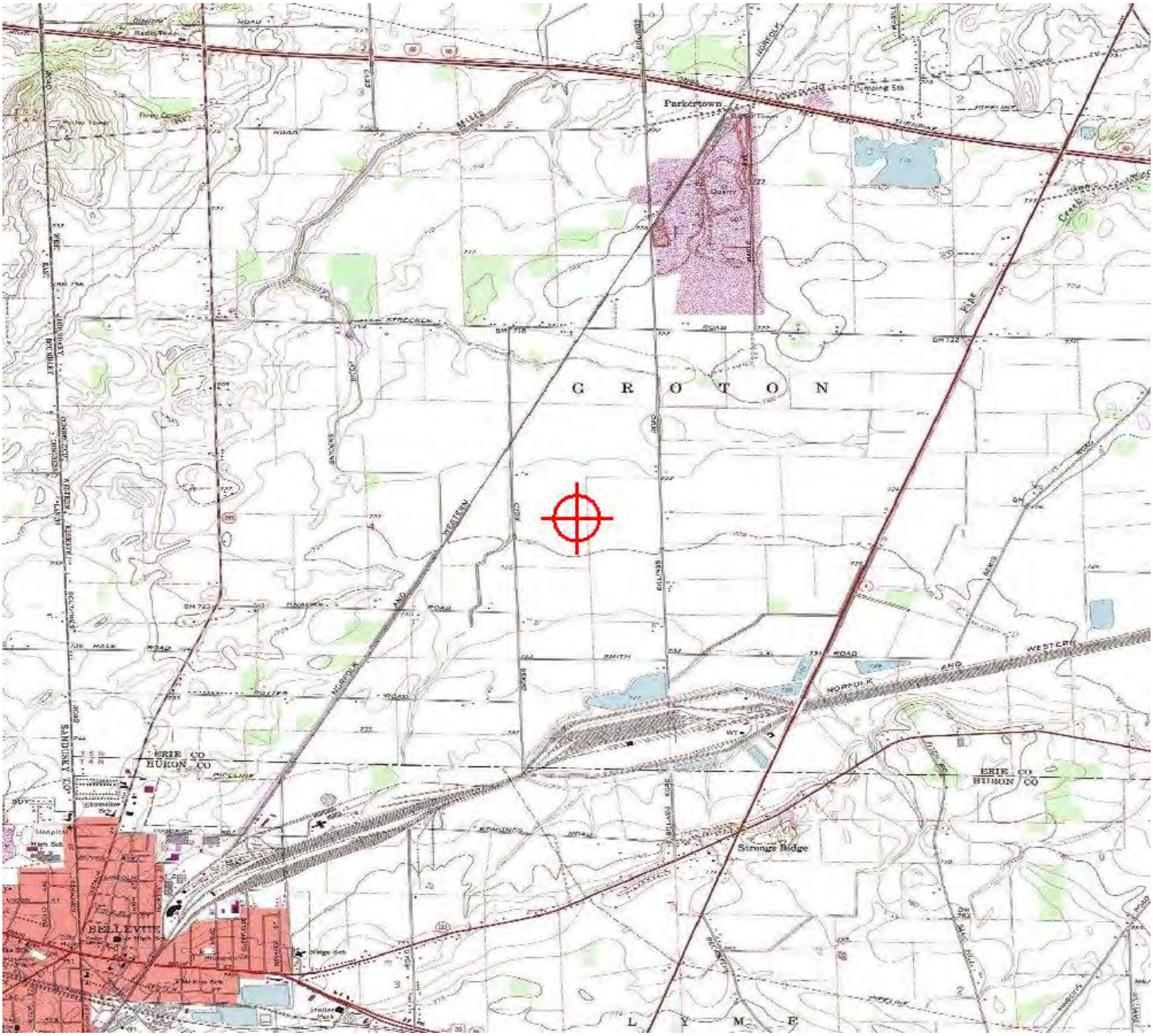
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

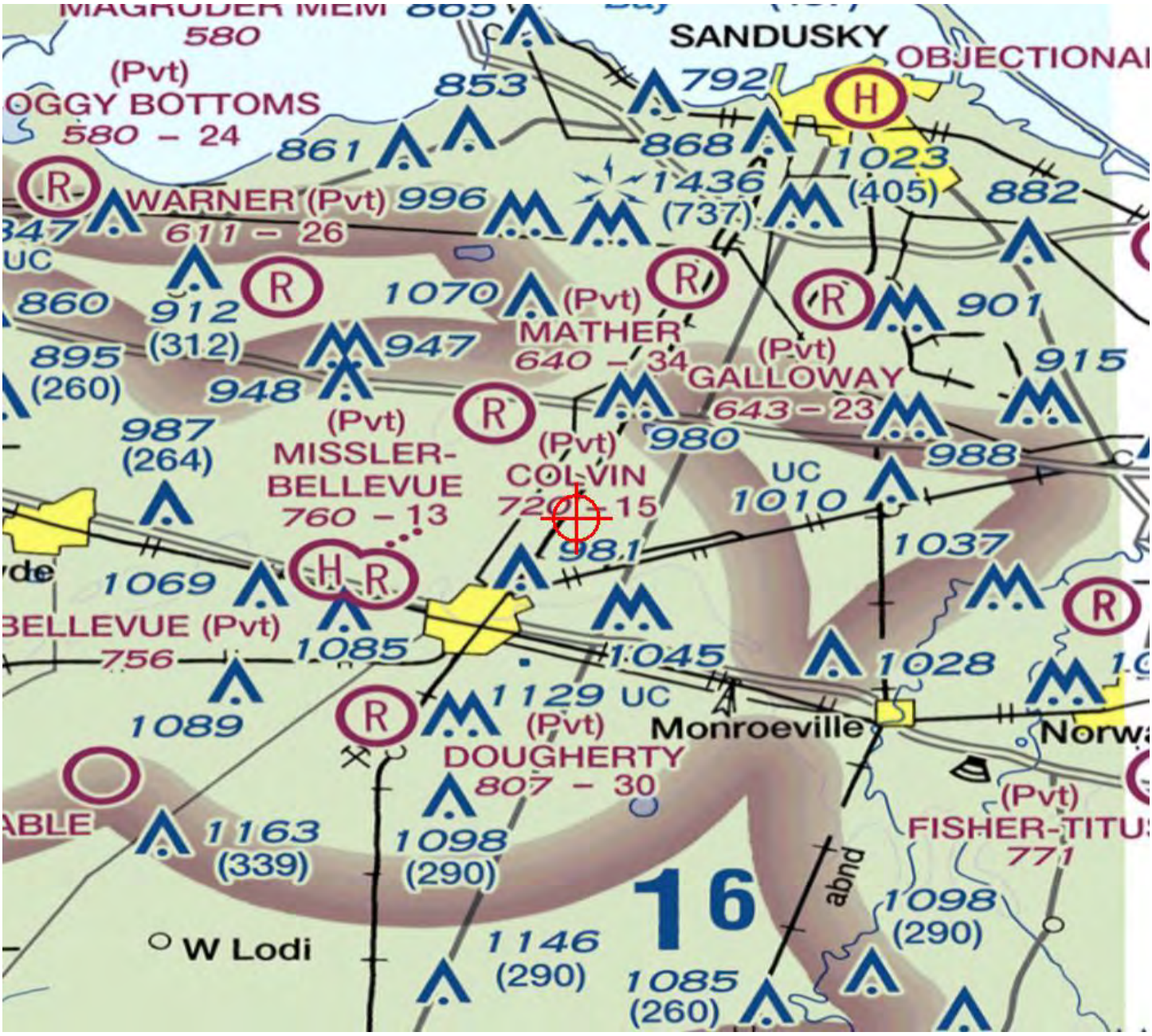
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11908-OE



Sectional Map for ASN 2018-WTE-11908-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11909-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T12
Location:	Bellevue, OH
Latitude:	41-18-20.22N NAD 83
Longitude:	82-47-15.50W
Heights:	726 feet site elevation (SE)
	659 feet above ground level (AGL)
	1385 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11909-OE.

Signature Control No: 392869060-430570197 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
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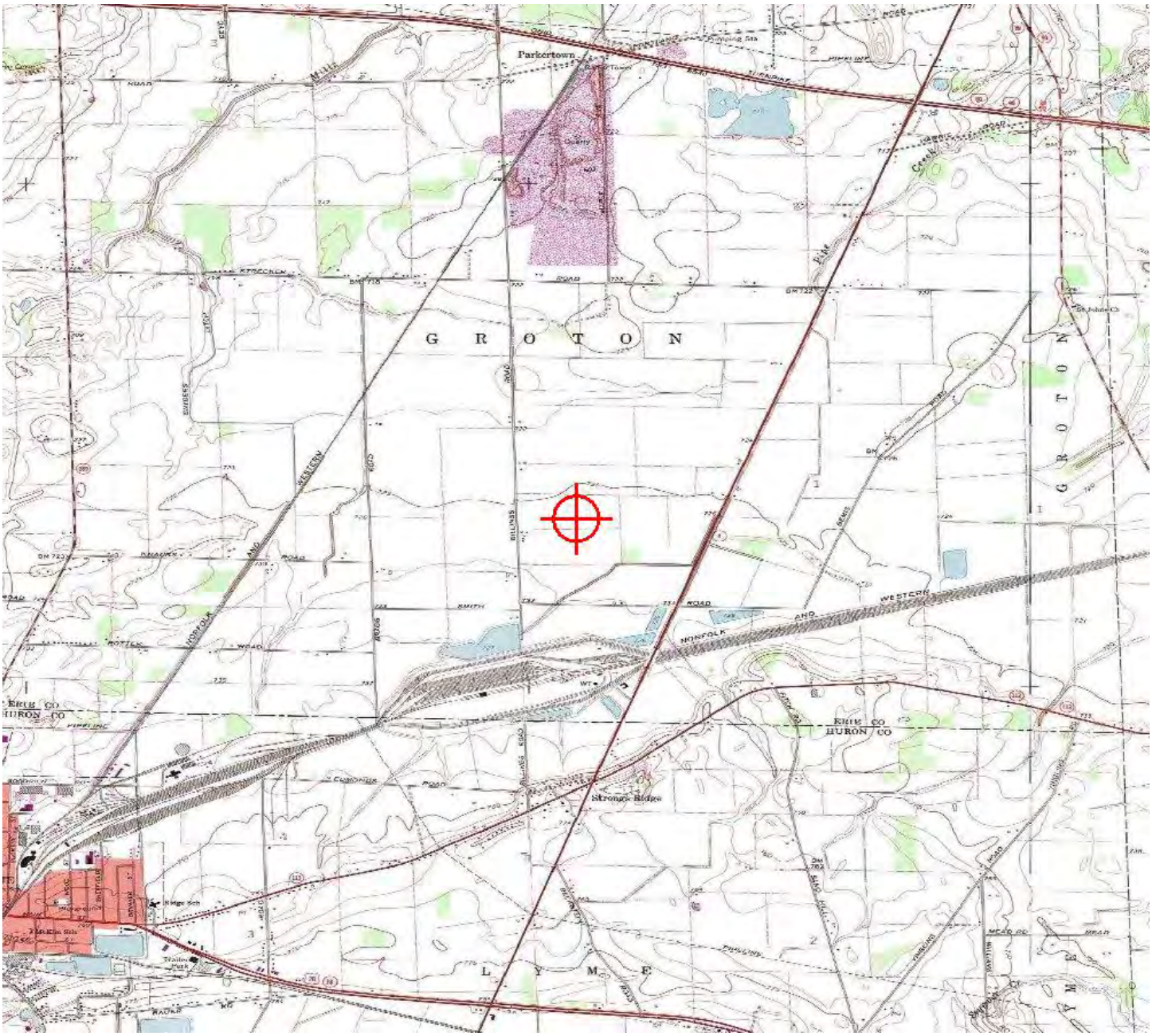
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

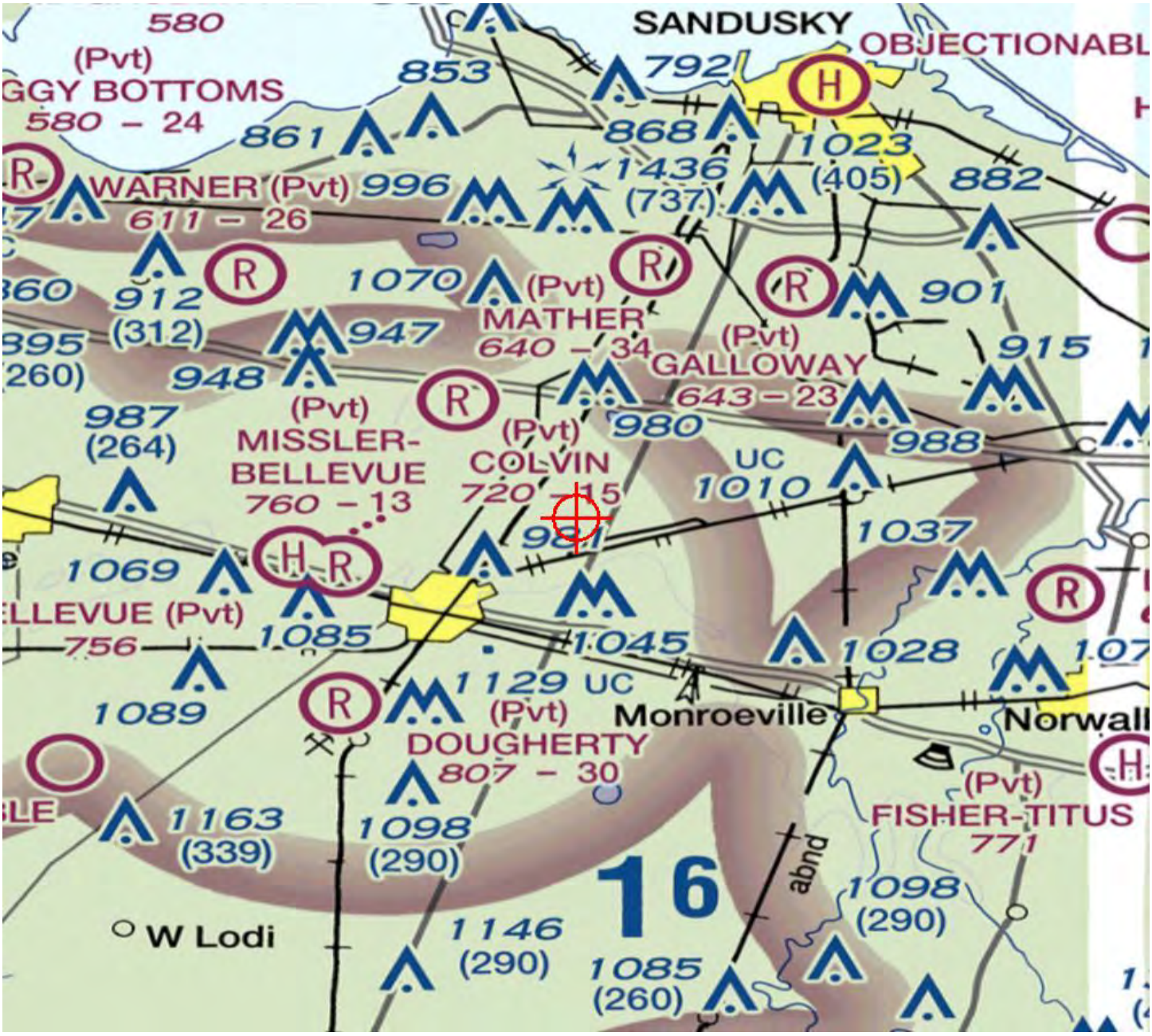
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11909-OE




SANDUSKY
OBJECTIONABL
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(Pvt)
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(405)
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(737)
WARNER (Pvt)
611 – 26
996
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(Pvt)
MATHER
640 – 34
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GALLOWAY
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(Pvt)
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11910-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T13
Location:	Bellevue, OH
Latitude:	41-18-18.46N NAD 83
Longitude:	82-46-53.64W
Heights:	724 feet site elevation (SE)
	659 feet above ground level (AGL)
	1383 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11910-OE.

Signature Control No: 392869061-430570205 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

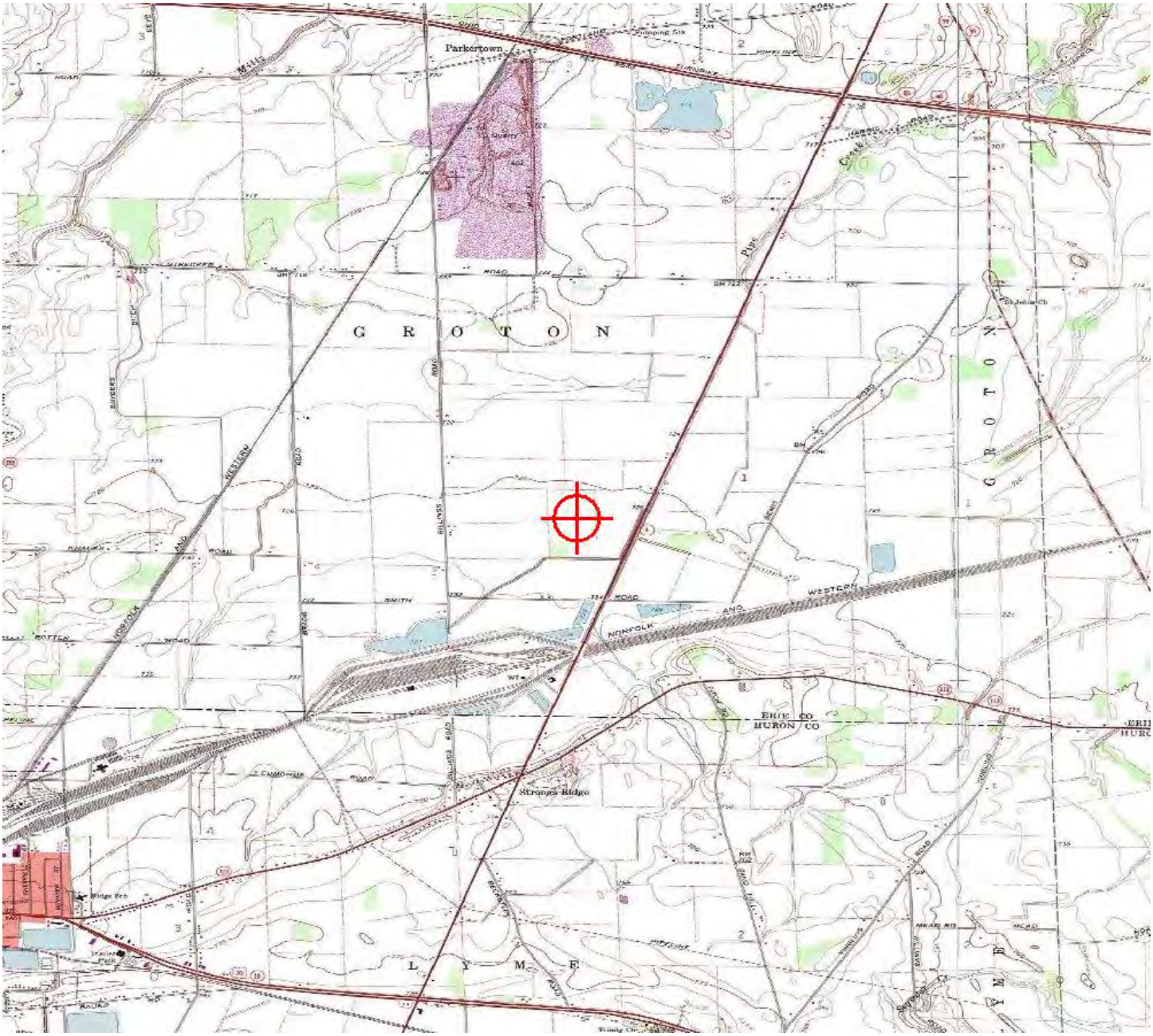
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

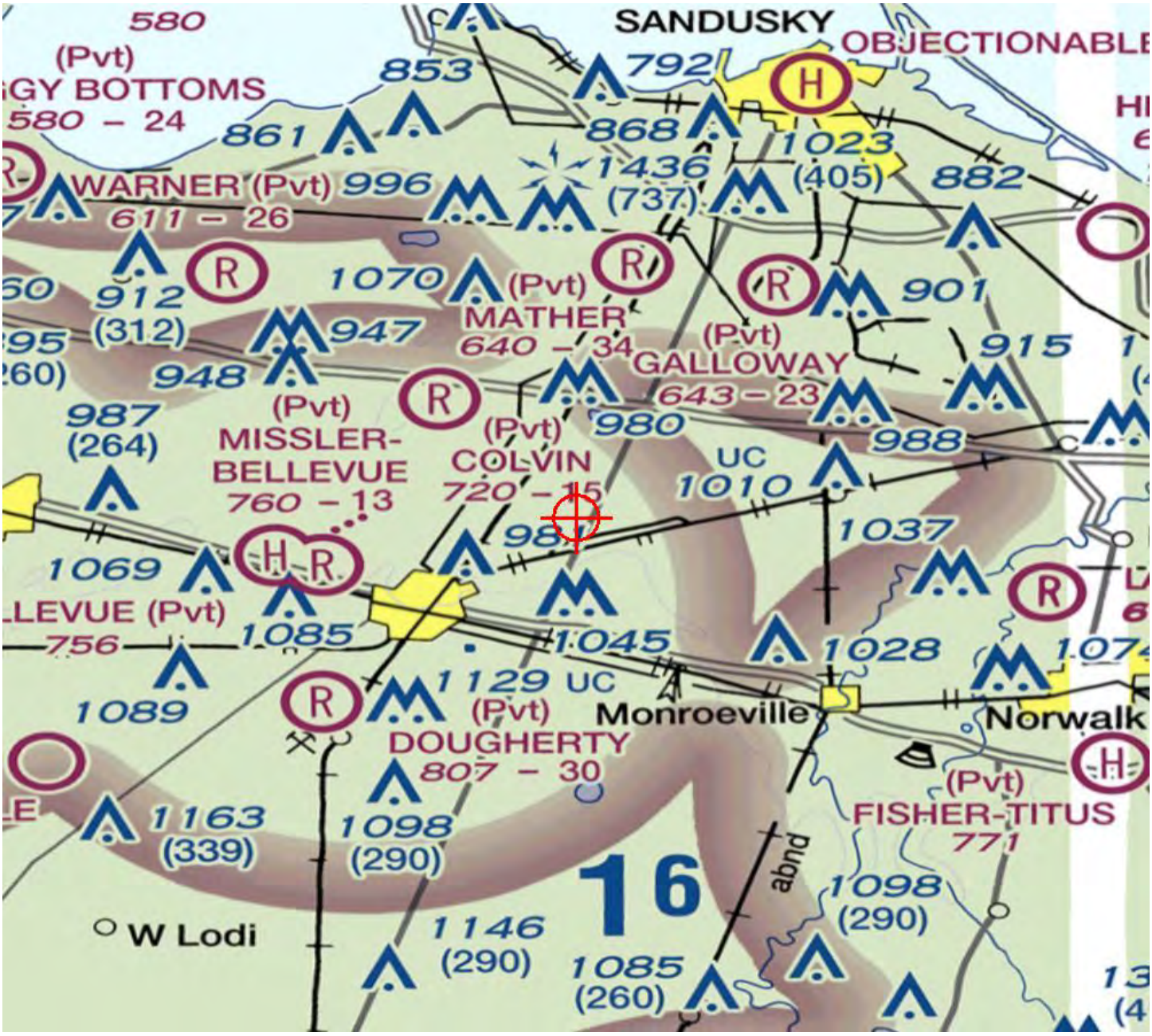
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11910-OE



Sectional Map for ASN 2018-WTE-11910-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11911-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T14
Location:	Bellevue, OH
Latitude:	41-18-13.69N NAD 83
Longitude:	82-41-49.09W
Heights:	704 feet site elevation (SE)
	659 feet above ground level (AGL)
	1363 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11911-OE.

Signature Control No: 392869062-430570201 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

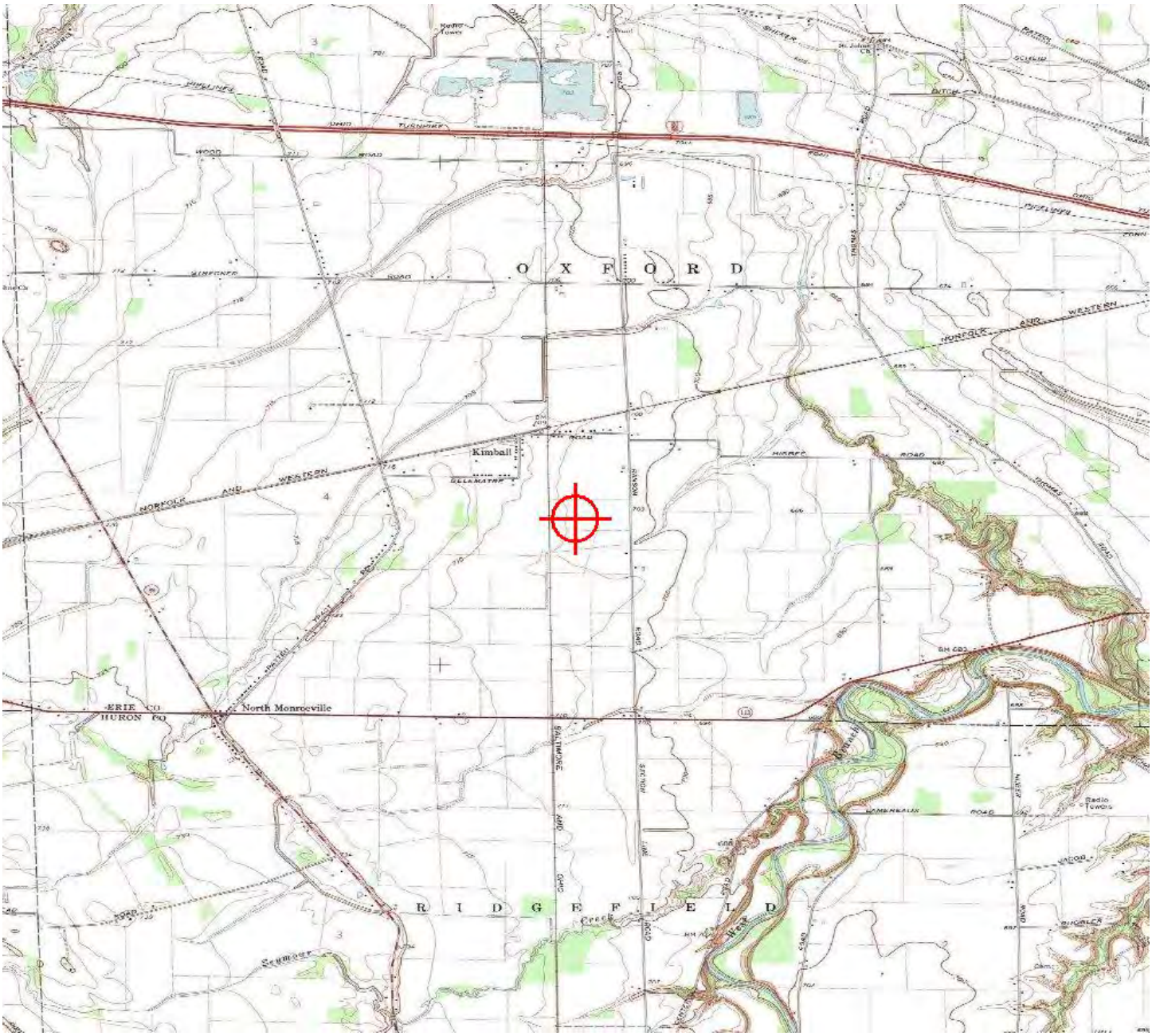
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

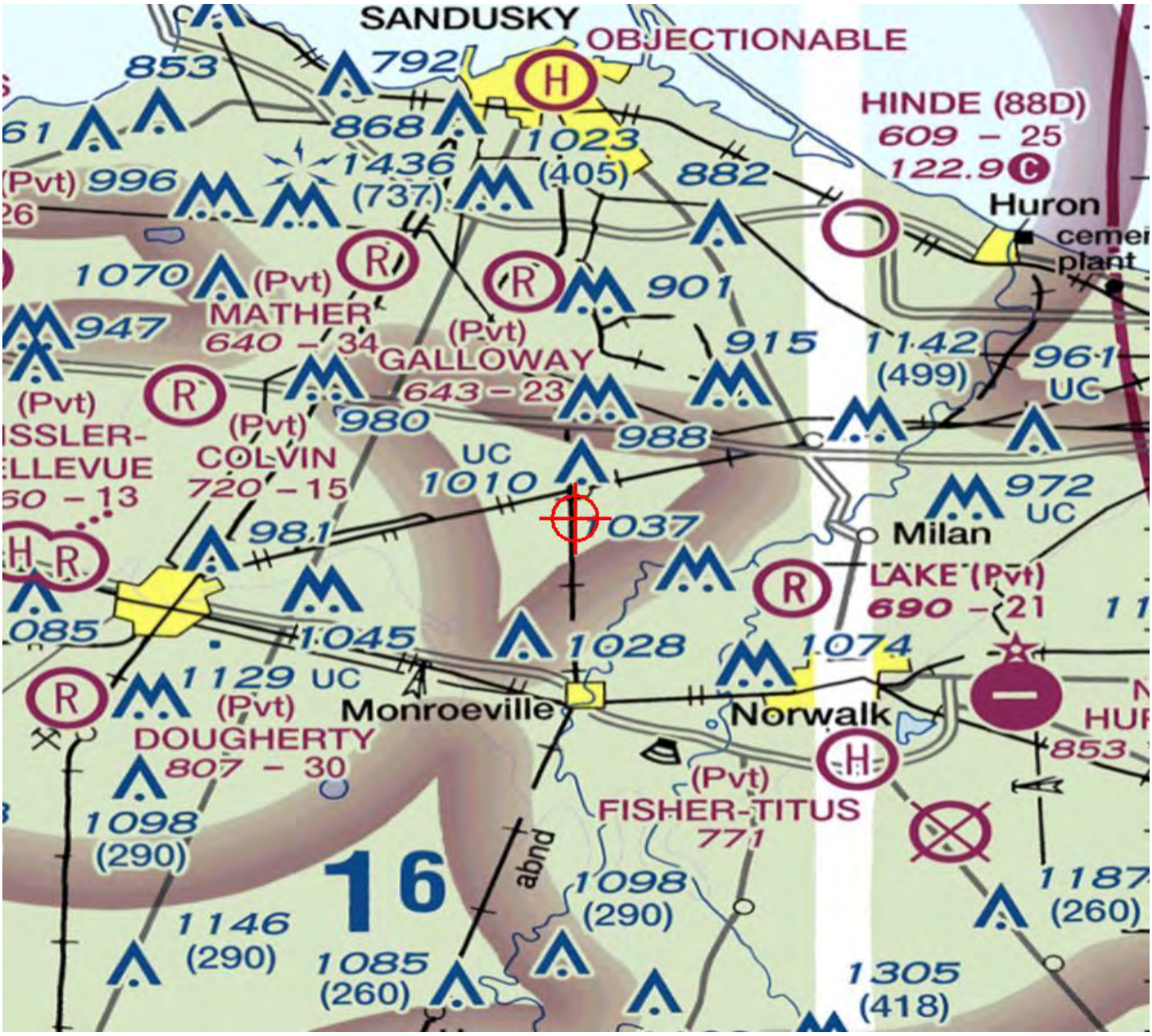
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11911-OE




SANDUSKY
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1070
(Pvt)
MATHER
640 – 34
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COLVIN
720 – 15
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690 – 21
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(418)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11912-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T15
Location:	Bellevue, OH
Latitude:	41-18-11.01N NAD 83
Longitude:	82-41-18.24W
Heights:	698 feet site elevation (SE)
	659 feet above ground level (AGL)
	1357 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11912-OE.

Signature Control No: 392869063-430570202 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

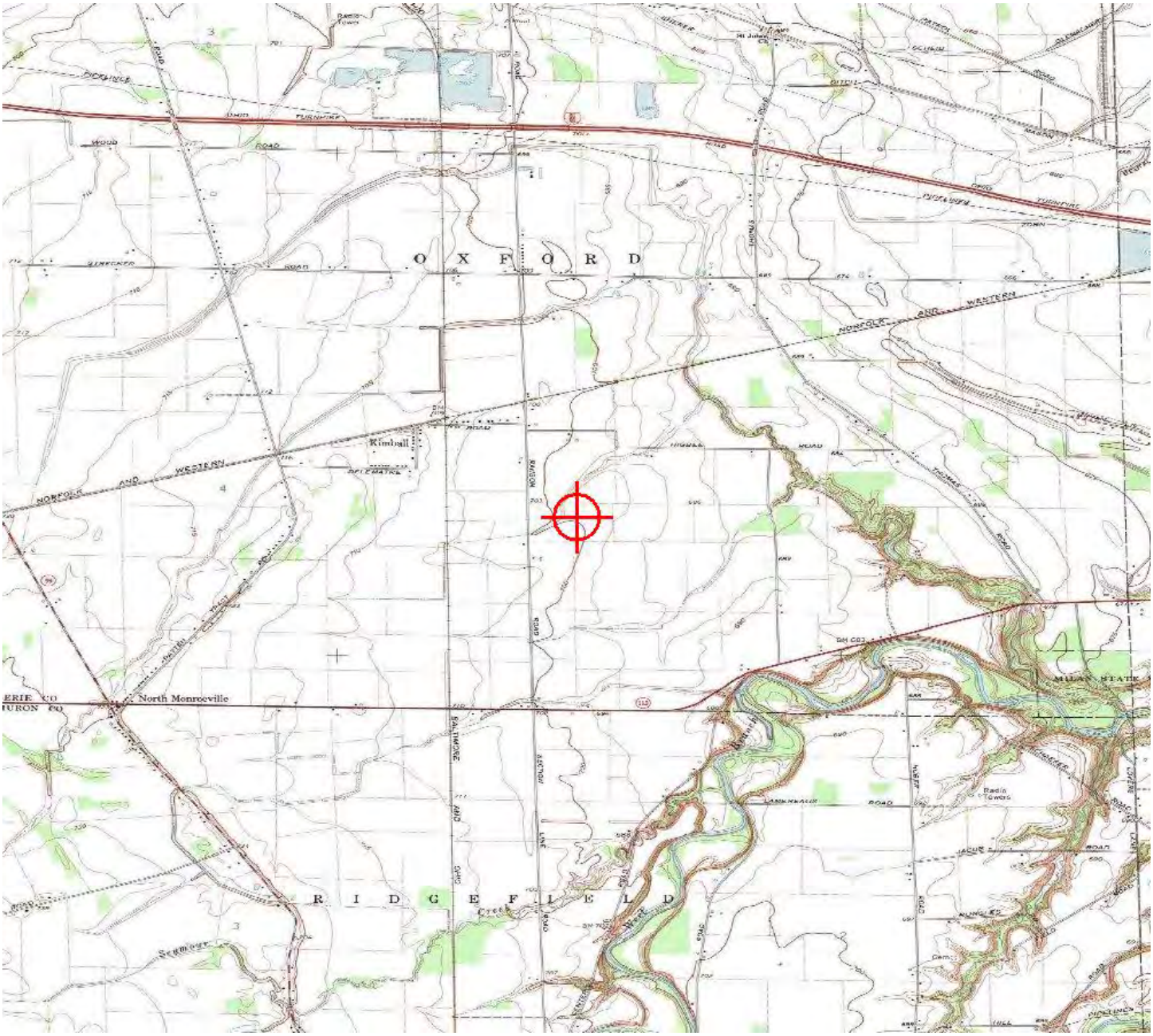
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

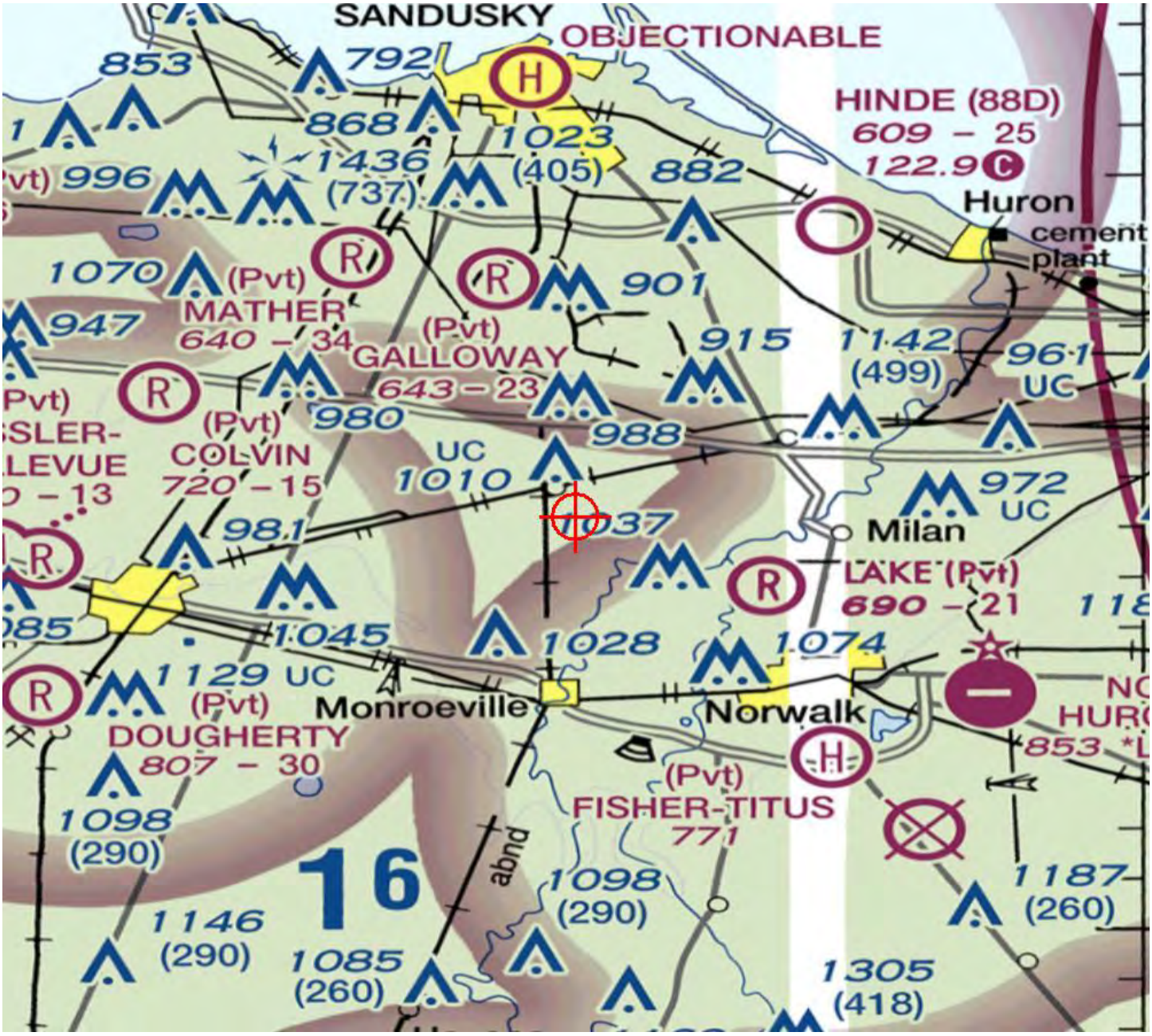
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11912-OE




SANDUSKY
OBJECTIONABLE
853
792
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1023
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1436
(737)
882
HINDE (88D)
609 – 25
122.9
Huron
cement plant
996
1070
(Pvt)
MATHER
640 – 34
901
947
(Pvt)
GALLOWAY
643 – 23
915
1142
(499)
961
UC
980
988
(Pvt)
COLVIN
720 – 15
UC
1010
972
UC
98.1
1037
Milan
LAKE (Pvt)
690 – 21
1045
1028
1074
1129 UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
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771
1098
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(418)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11913-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T16
Location:	Bellevue, OH
Latitude:	41-18-06.70N NAD 83
Longitude:	82-41-02.12W
Heights:	692 feet site elevation (SE)
	659 feet above ground level (AGL)
	1351 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11913-OE.

Signature Control No: 392869064-430570198 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

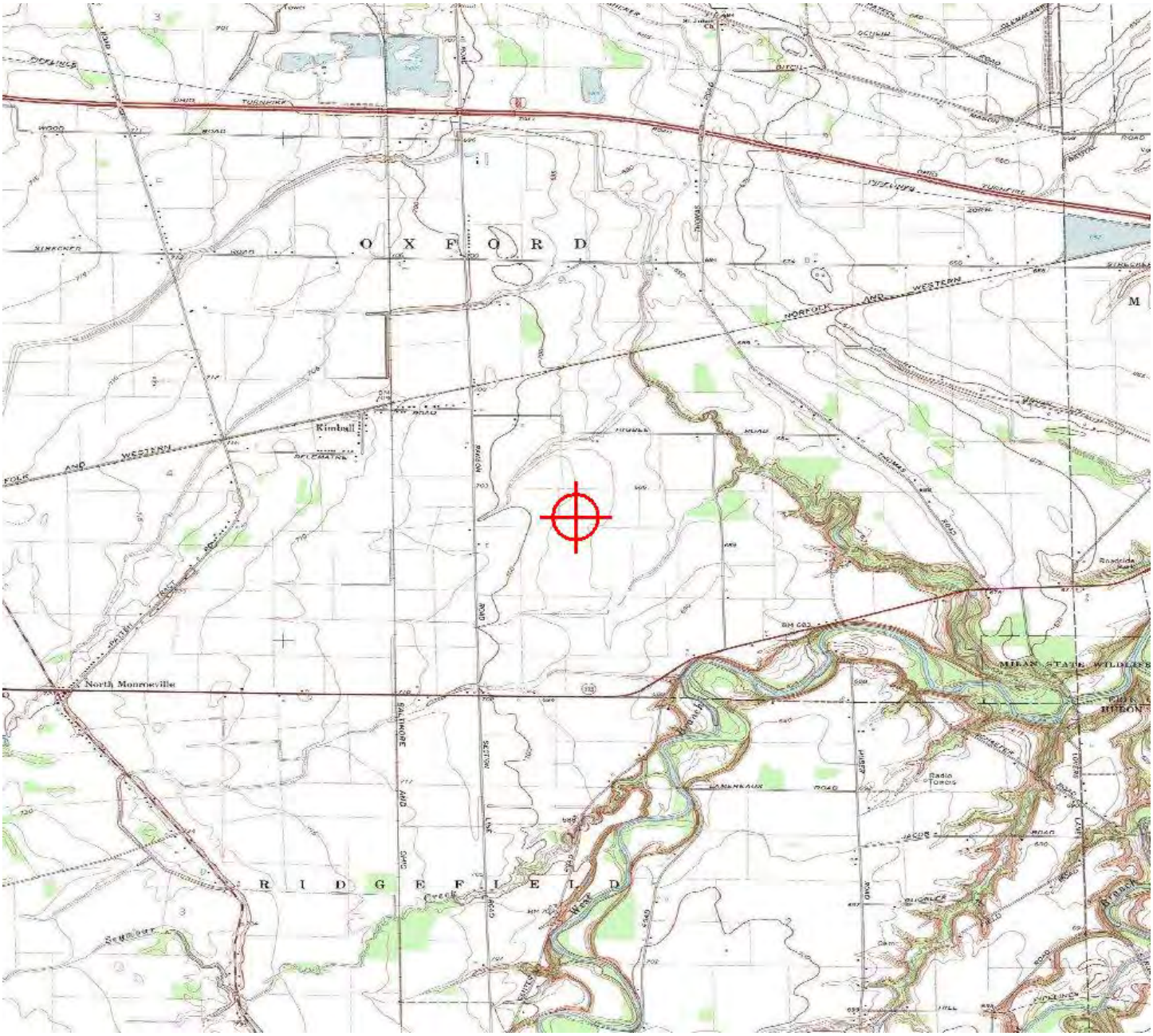
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

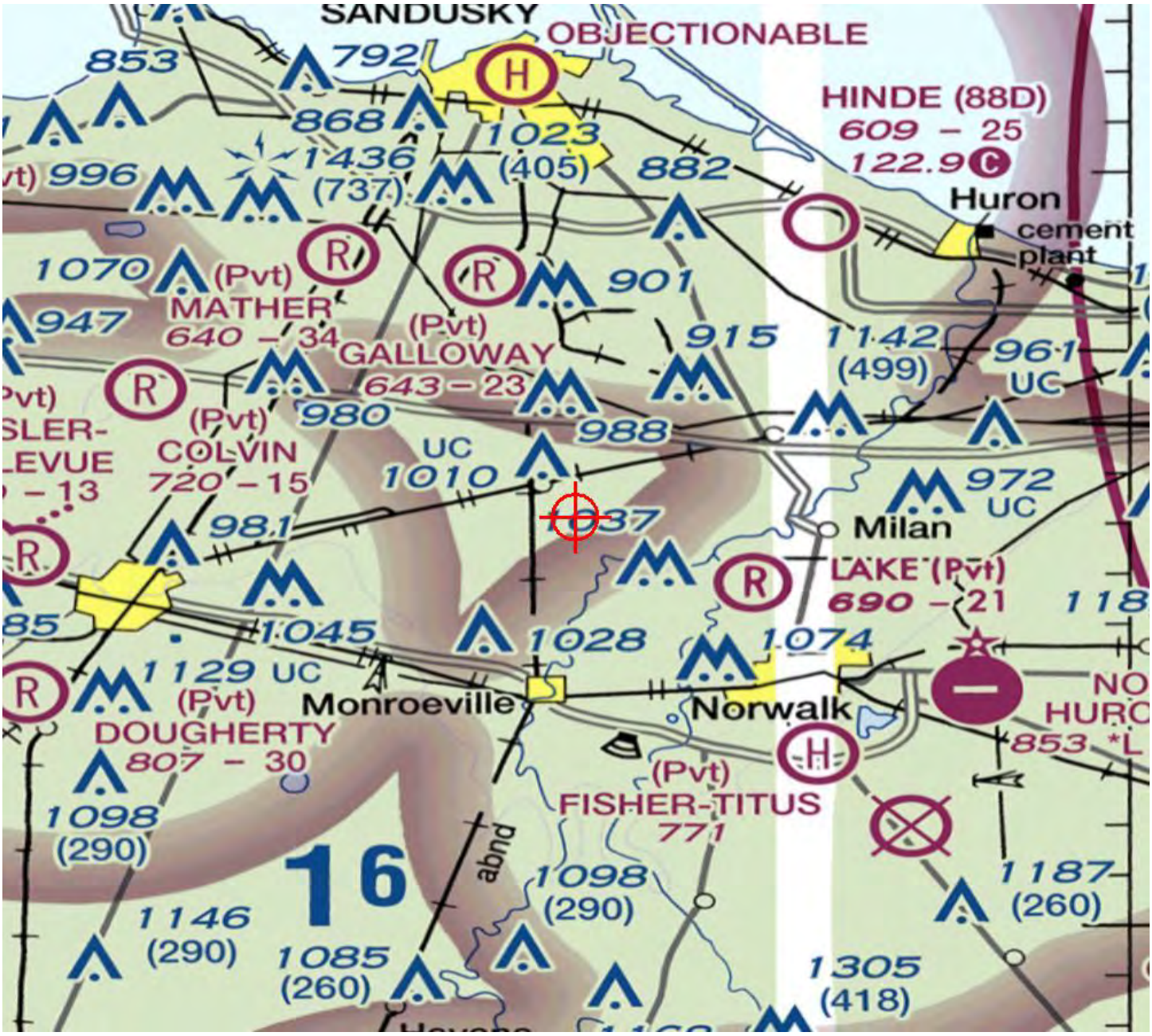
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11913-OE




SANDUSKY
OBJECTIONABLE
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HINDE (88D)
609 – 25
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1070
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640 – 34
947
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901
915
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Milan
LAKE (Pvt)
690 – 21
1045
1028
1074
1129
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Monroeville
Norwalk
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1098
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(418)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11914-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T17
Location:	Bellevue, OH
Latitude:	41-17-51.98N NAD 83
Longitude:	82-44-29.72W
Heights:	716 feet site elevation (SE)
	659 feet above ground level (AGL)
	1375 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11914-OE.

Signature Control No: 392869065-430570244 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

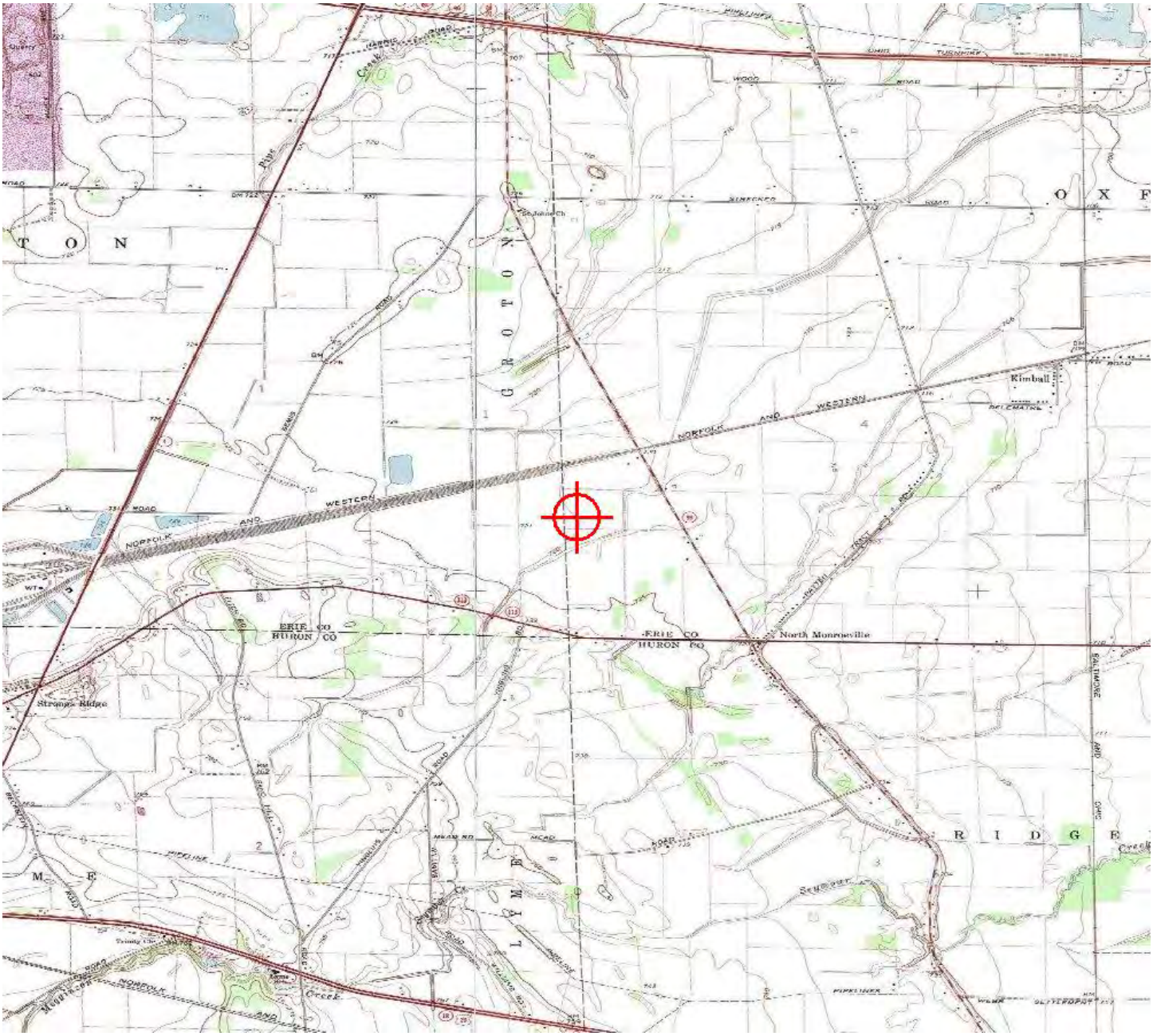
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11914-OE



OBJECTIONABLE
792
853
861
868
1023
(405)
1436
(737)
996
882
HINDE
609 –
122.9
ARNER (Pvt)
611 – 26
1070
(Pvt)
MATHER
640 – 34
947
948
(Pvt)
MISSLER-
BELLEVUE
760 – 13
(Pvt)
COLVIN
720 – 15
(Pvt)
GALLOWAY
643 – 23
980
901
915
1142
(499)
988
UC
1010
1037
98.1
Milan
LAKE (Pv
690 –
(Pvt)
1085
1045
1028
1074
1129 UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
(Pvt)
FISHER-TITUS
771
1163
(339)
1098
(290)
16
abnd
1098
(290)
W Lodi
1146
(290)
1085
(260)
1305
(418)
Havana
1168

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11915-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T18
Location:	Bellevue, OH
Latitude:	41-17-41.67N NAD 83
Longitude:	82-45-14.48W
Heights:	724 feet site elevation (SE)
	659 feet above ground level (AGL)
	1383 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11915-OE.

Signature Control No: 392869066-430570245 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

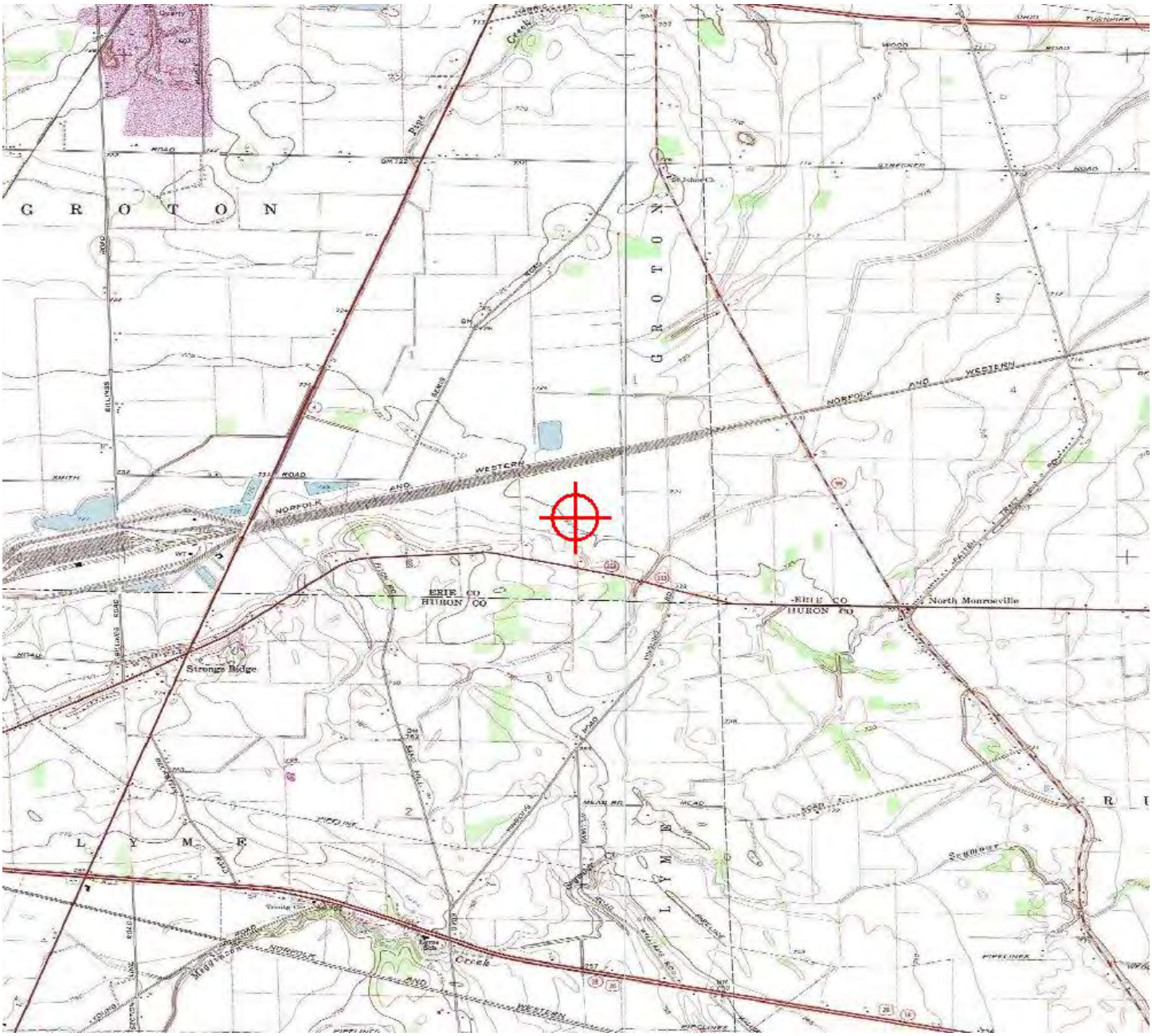
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

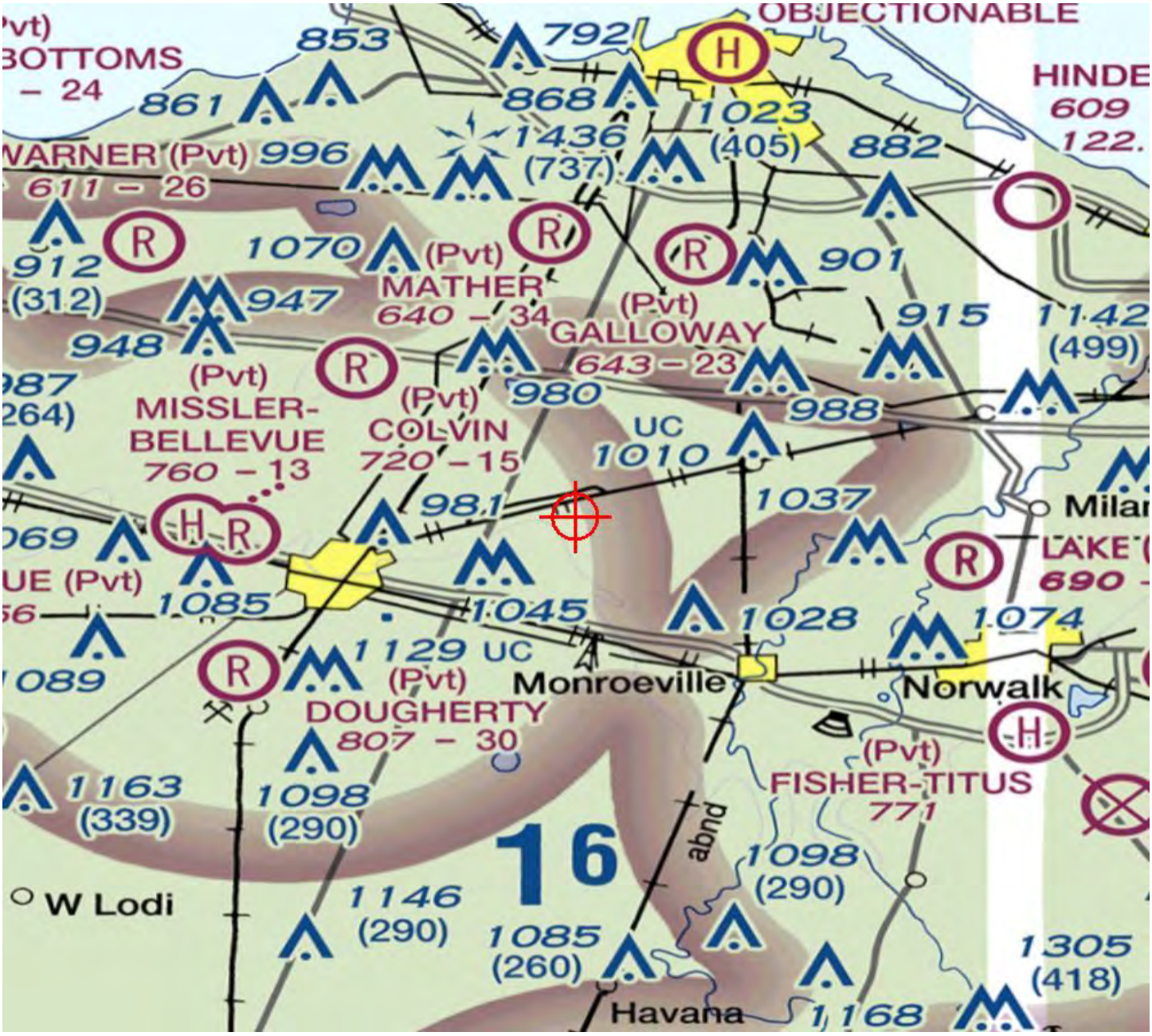
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11915-OE



Sectional Map for ASN 2018-WTE-11915-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11916-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T19
Location:	Bellevue, OH
Latitude:	41-17-42.06N NAD 83
Longitude:	82-44-16.18W
Heights:	718 feet site elevation (SE)
	659 feet above ground level (AGL)
	1377 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11916-OE.

Signature Control No: 392869067-430570306 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

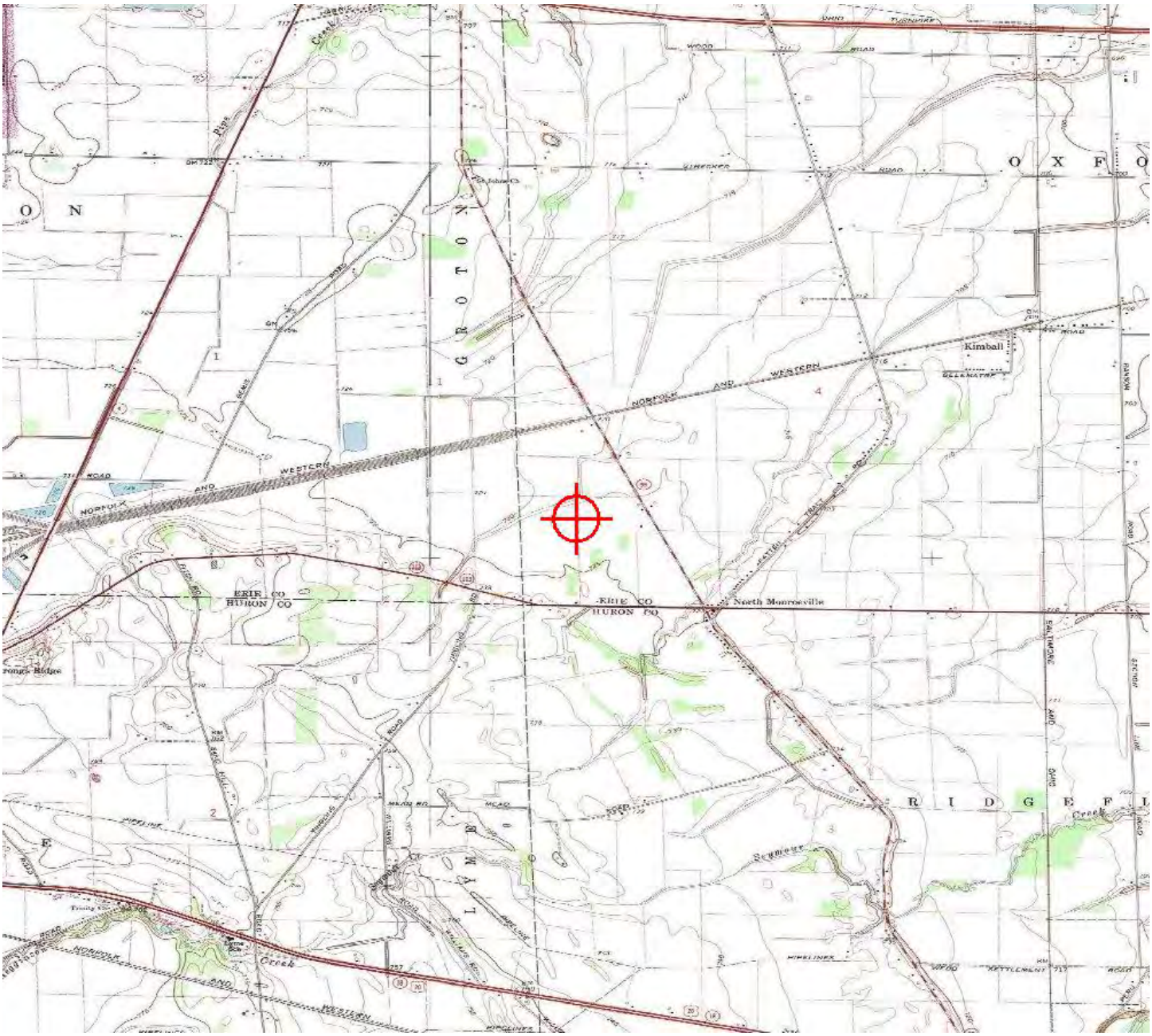
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

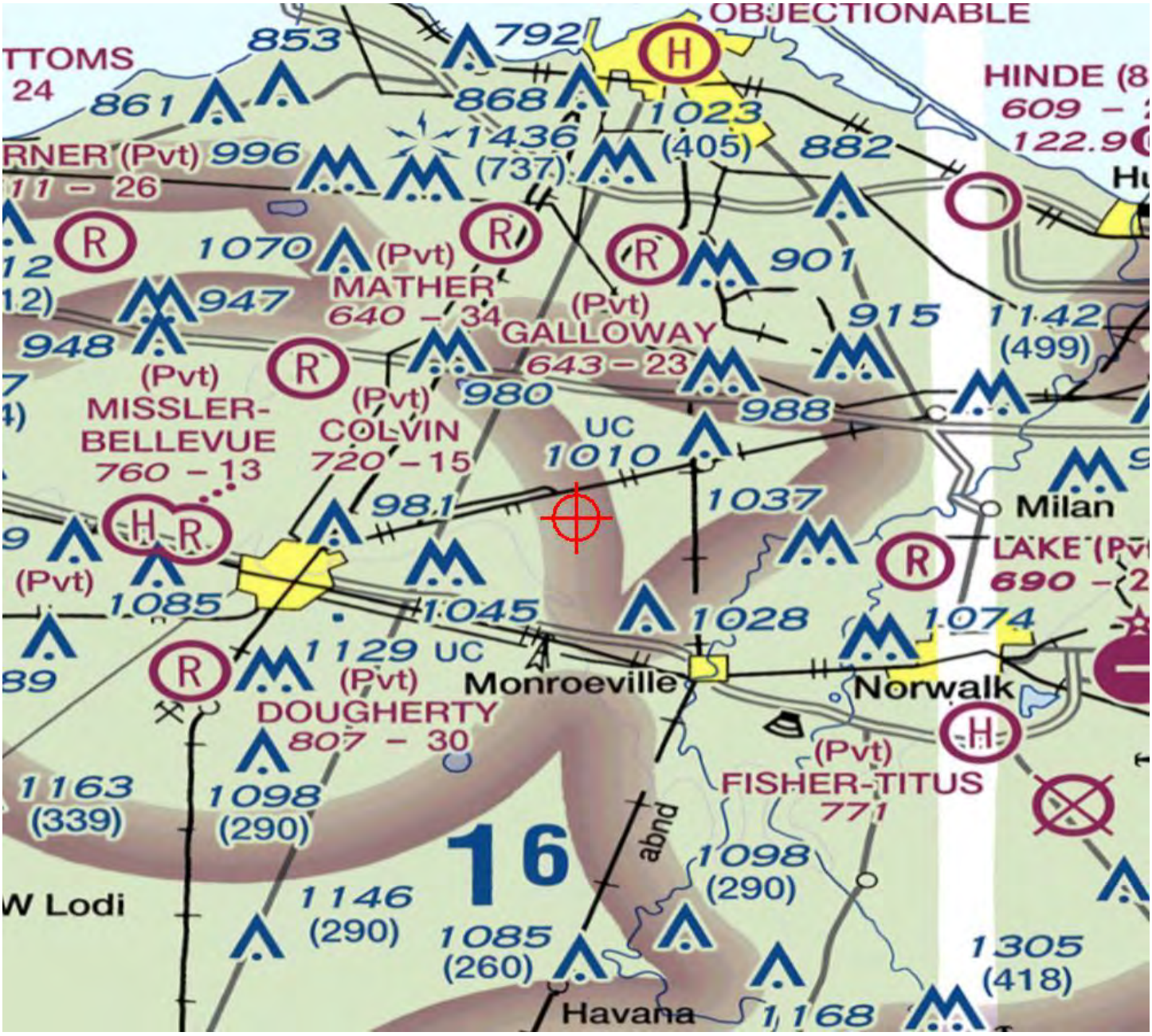
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11916-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2019-WTE-1150-OE
Prior Study No.
2018-WTE-11918-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T20
Location:	Bellevue, OH
Latitude:	41-17-30.41N NAD 83
Longitude:	82-44-06.47W
Heights:	723 feet site elevation (SE)
	659 feet above ground level (AGL)
	1382 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2019-WTE-1150-OE.

Signature Control No: 395640547-430570785 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

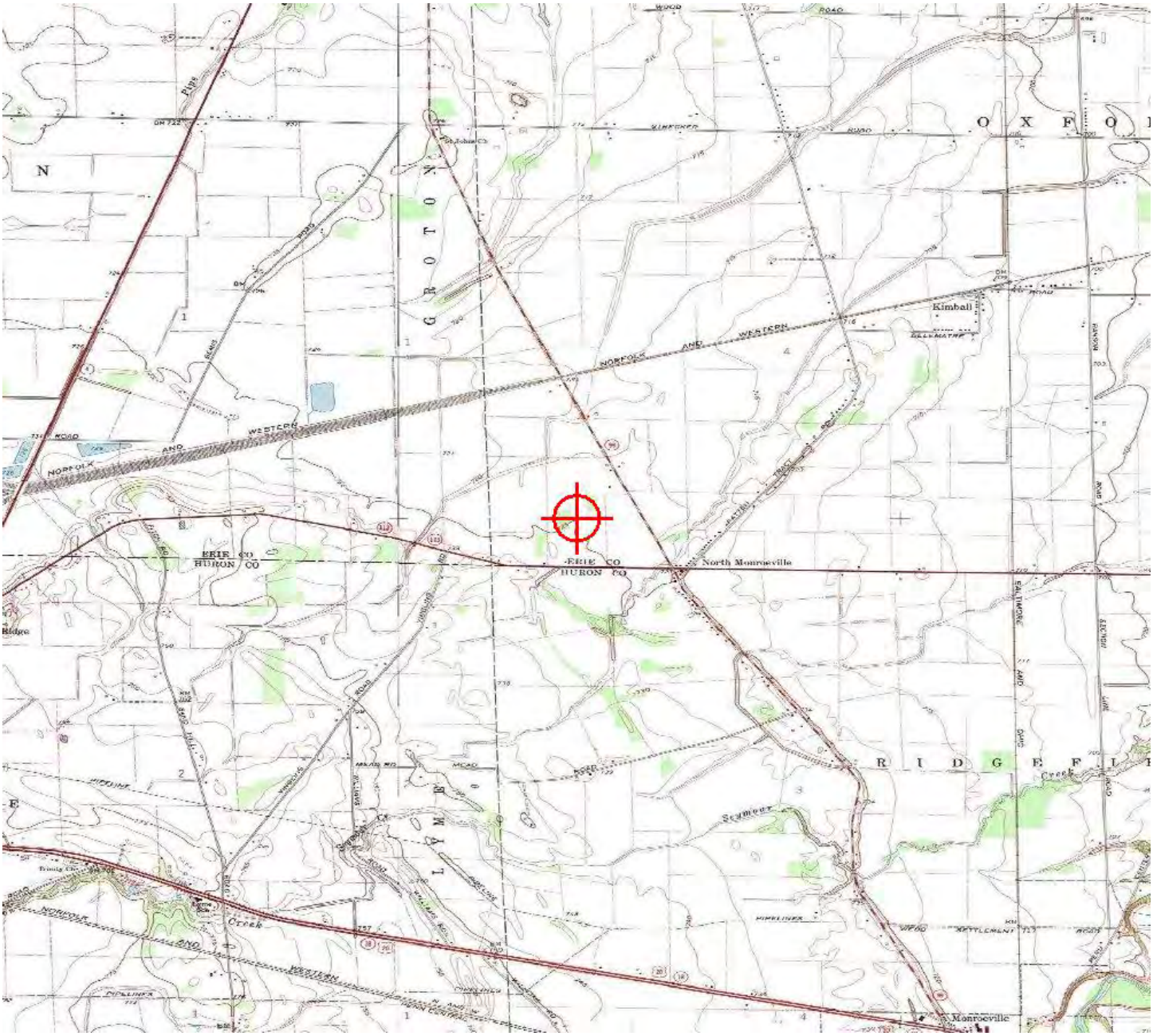
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

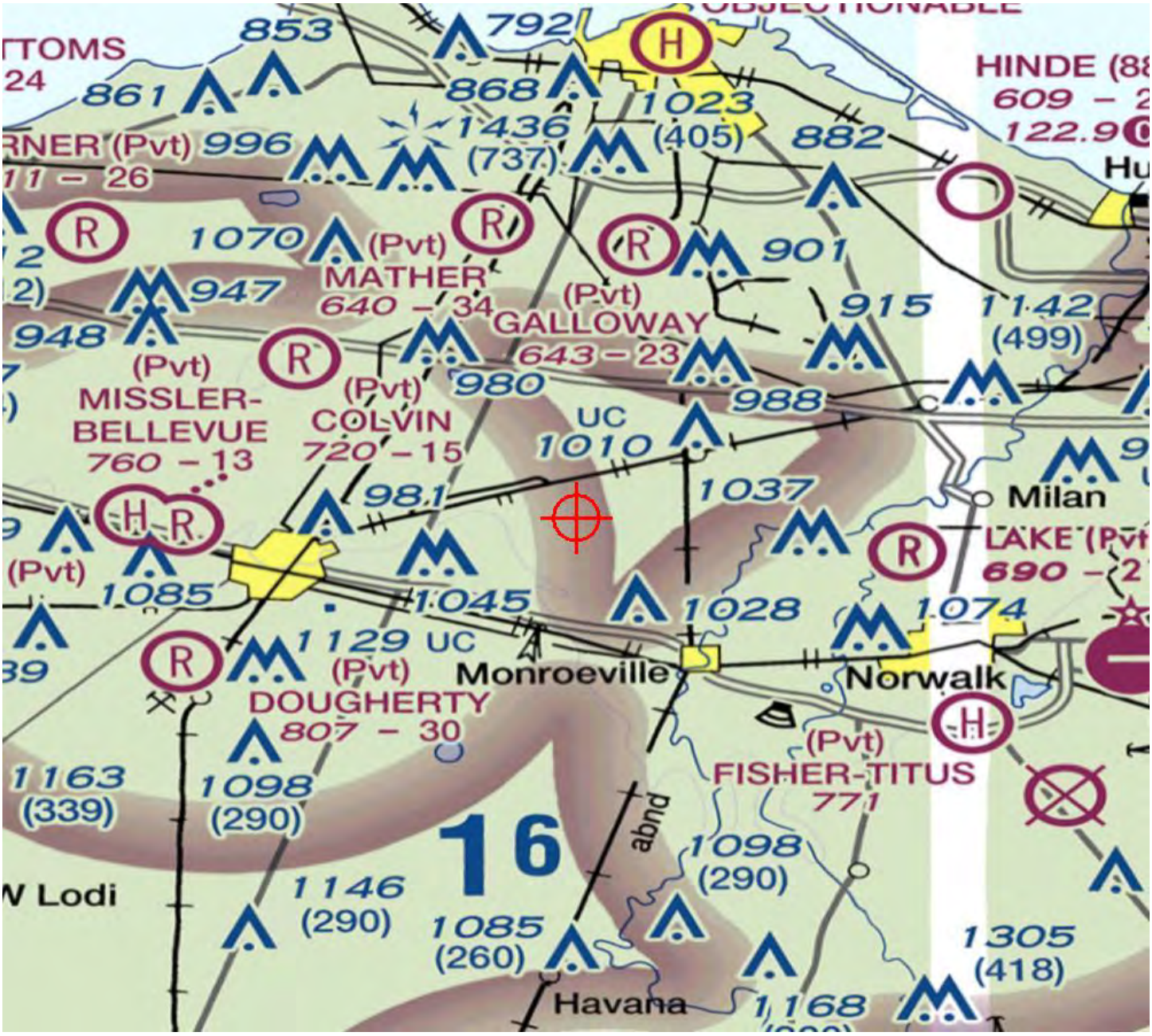
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2019-WTE-1150-OE



Sectional Map for ASN 2019-WTE-1150-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11919-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T21
Location:	Bellevue, OH
Latitude:	41-17-12.38N NAD 83
Longitude:	82-45-19.15W
Heights:	742 feet site elevation (SE)
	659 feet above ground level (AGL)
	1401 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11919-OE.

Signature Control No: 392869070-430570204 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

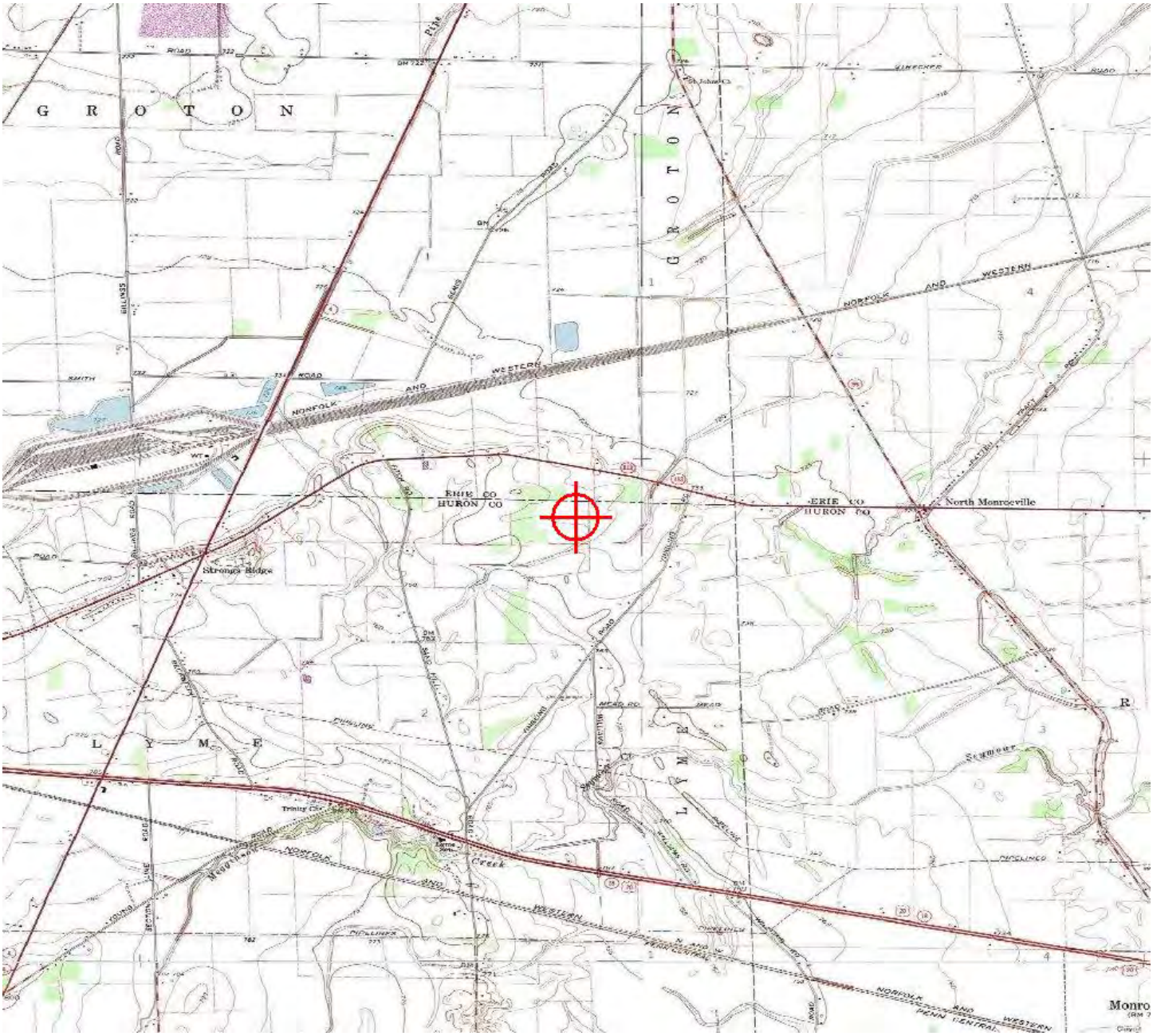
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

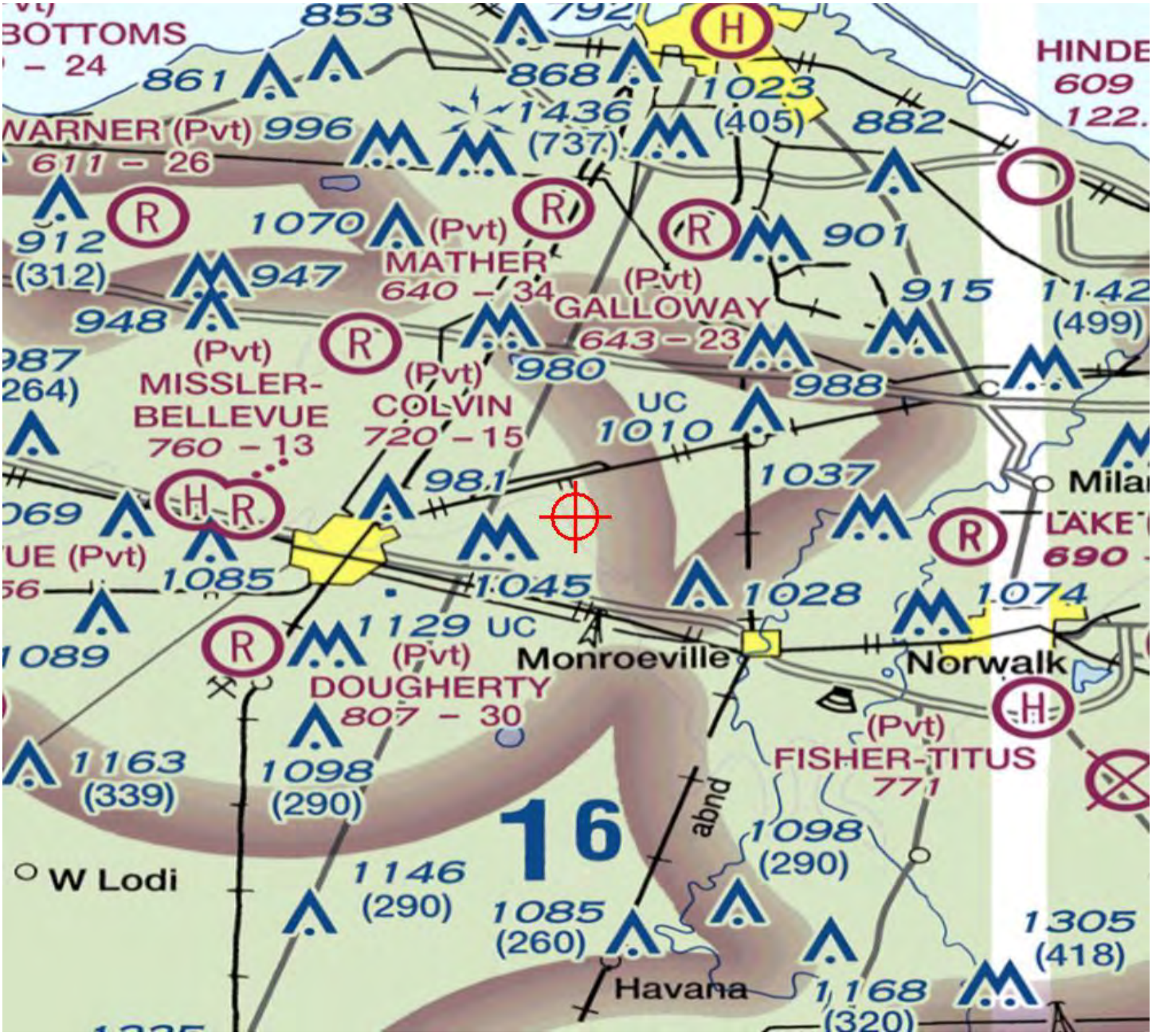
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11919-OE



Sectional Map for ASN 2018-WTE-11919-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11920-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T22
Location:	Bellevue, OH
Latitude:	41-17-02.56N NAD 83
Longitude:	82-44-12.71W
Heights:	730 feet site elevation (SE)
	659 feet above ground level (AGL)
	1389 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11920-OE.

Signature Control No: 392869071-430570281 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

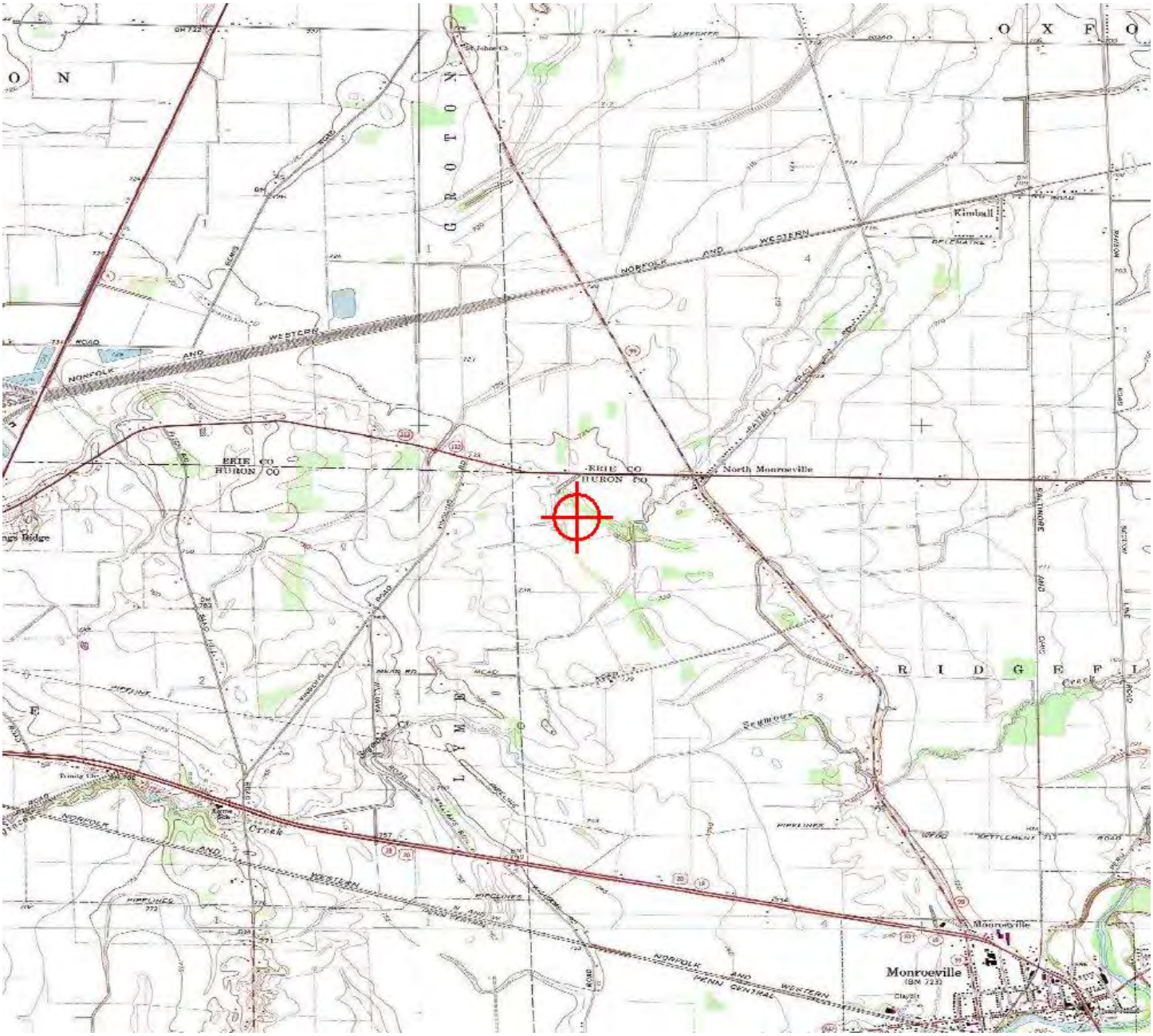
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

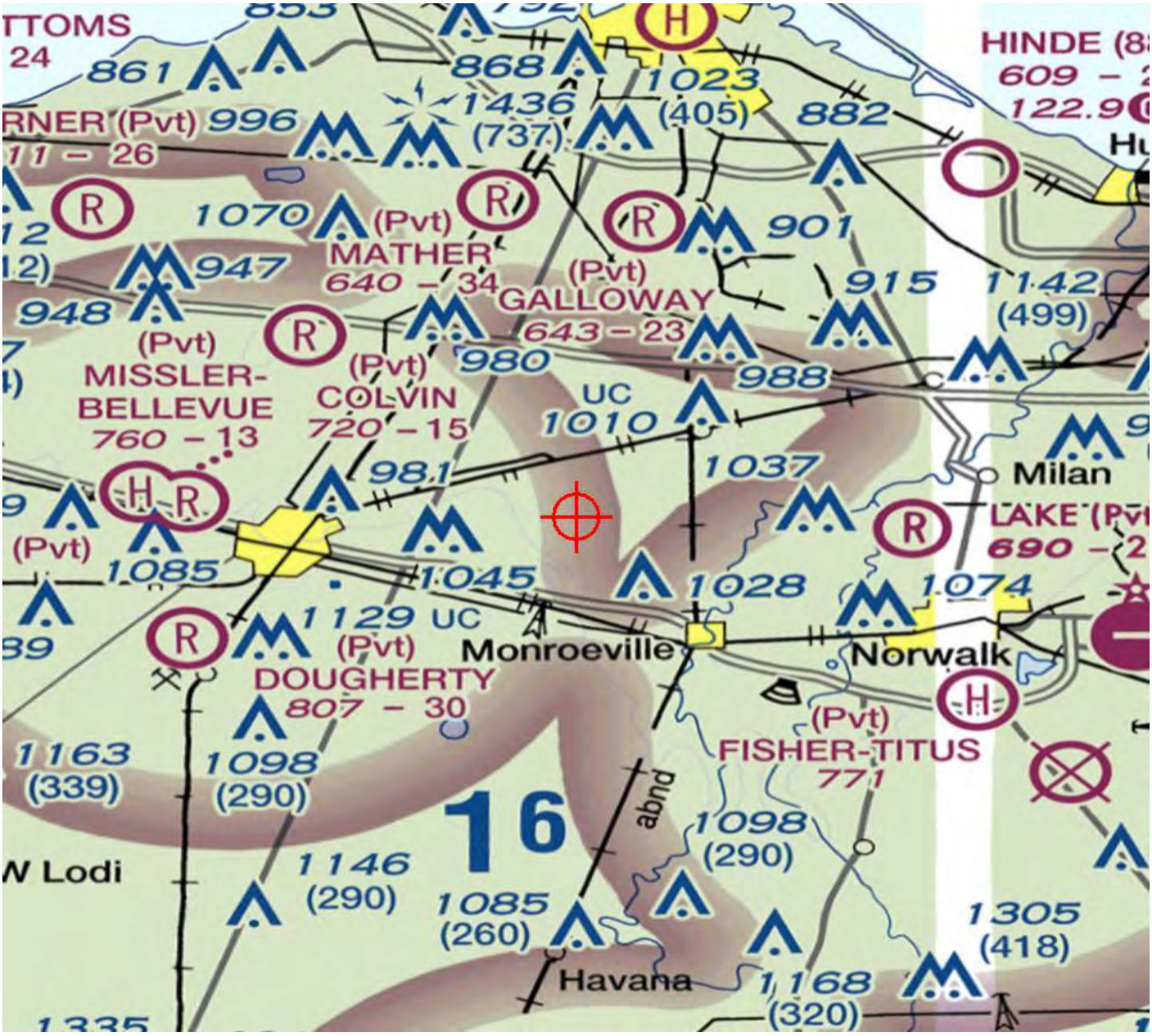
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11920-OE

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(Pvt)
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643 – 23
915
1142
(499)
988
UC
1010
1037
98.1
Milan
LAKE (Pvt
690 – 2
1085
1045
1028
1074
1129
UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
(Pvt)
FISHER-TITUS
771
1163
(339)
1098
(290)
16
abnd
1098
(290)
1146
(290)
1085
(260)
Havana
1305
(418)
1168
(320)
N Lodi

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11921-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T23
Location:	Bellevue, OH
Latitude:	41-15-49.62N NAD 83
Longitude:	82-45-25.29W
Heights:	754 feet site elevation (SE)
	659 feet above ground level (AGL)
	1413 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11921-OE.

Signature Control No: 392869072-430570280 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

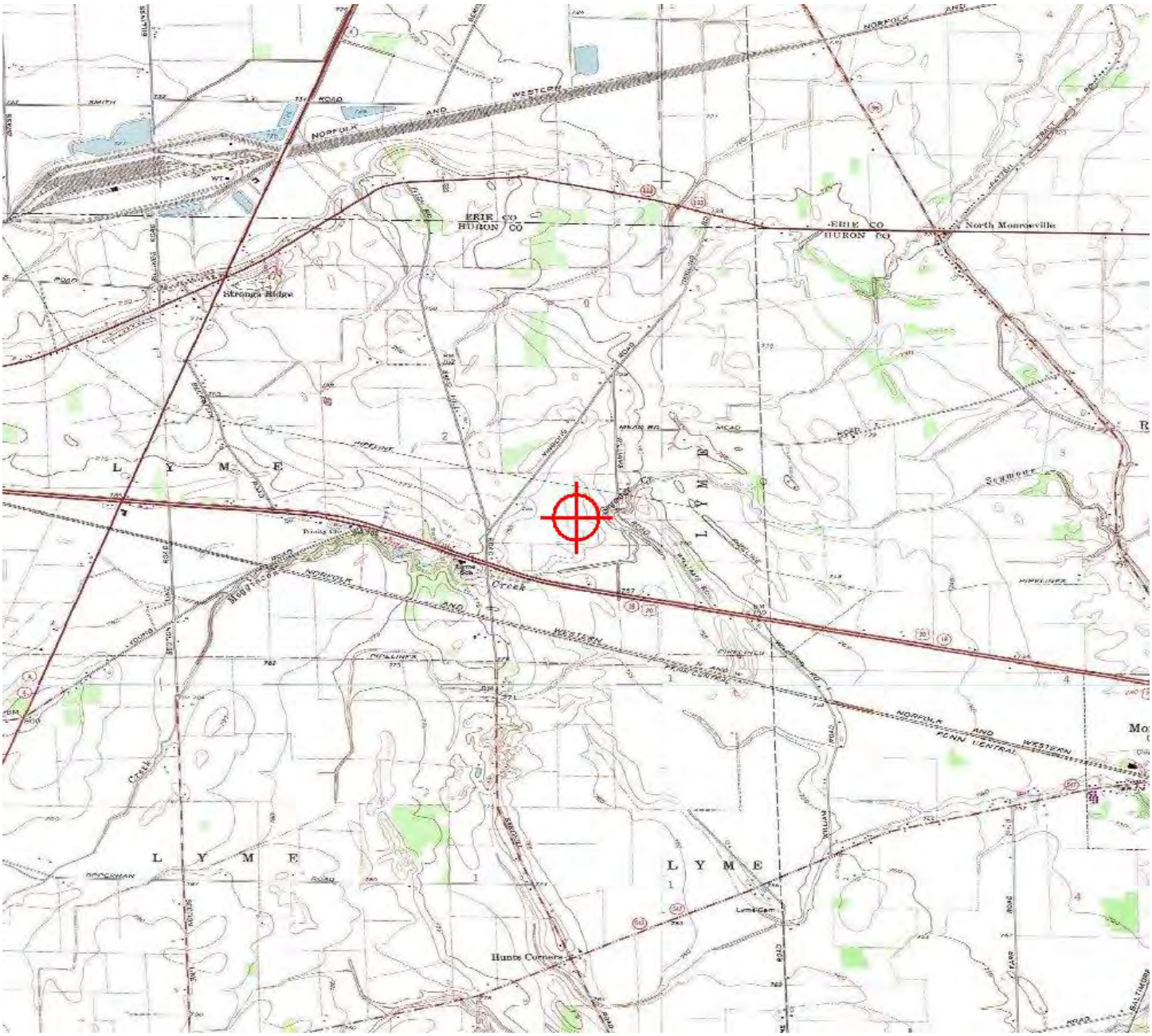
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

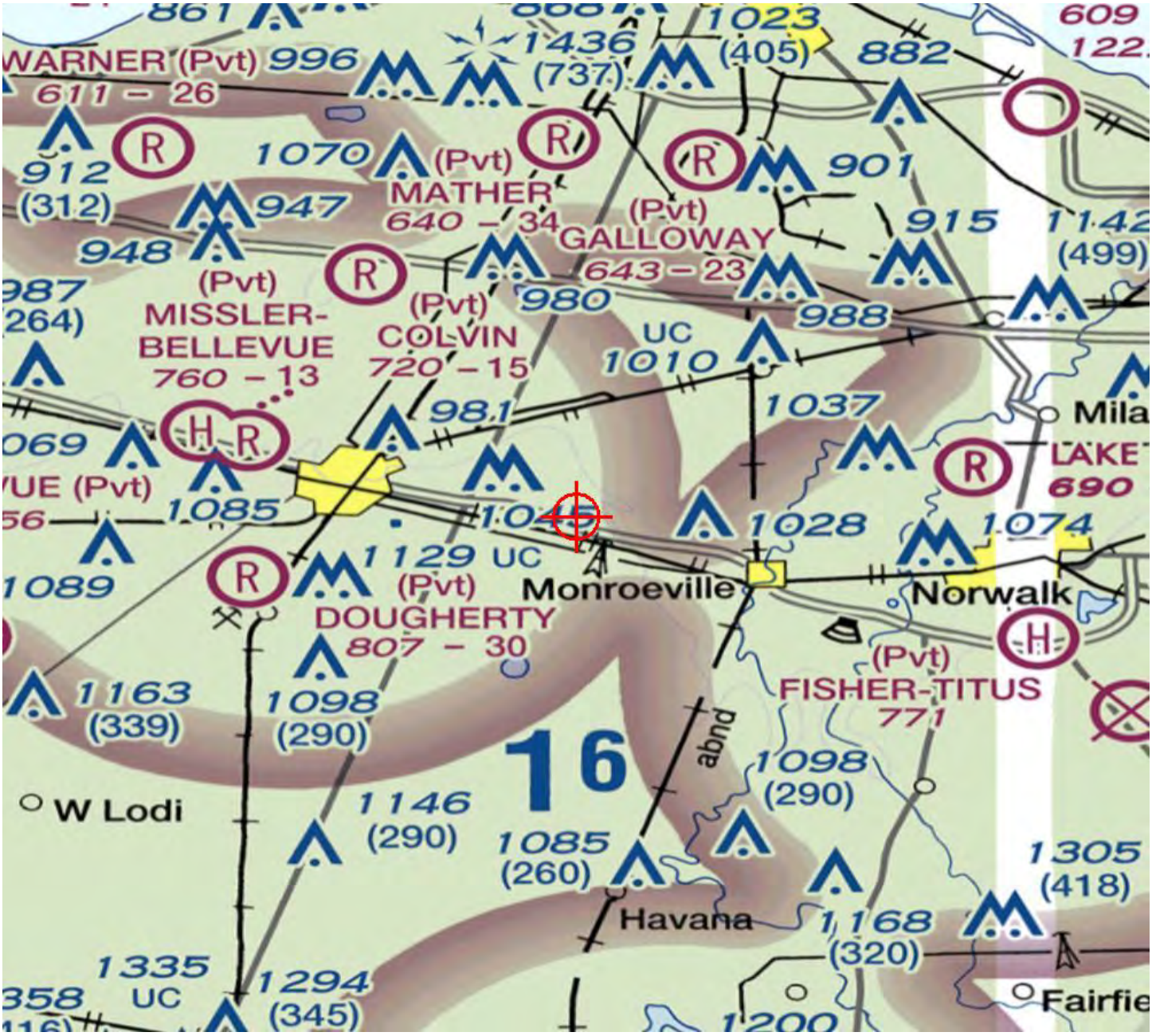
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11921-OE



Sectional Map for ASN 2018-WTE-11921-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11922-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T24
Location:	Bellevue, OH
Latitude:	41-15-41.31N NAD 83
Longitude:	82-48-35.15W
Heights:	782 feet site elevation (SE)
	659 feet above ground level (AGL)
	1441 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11922-OE.

Signature Control No: 392869073-430570315 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

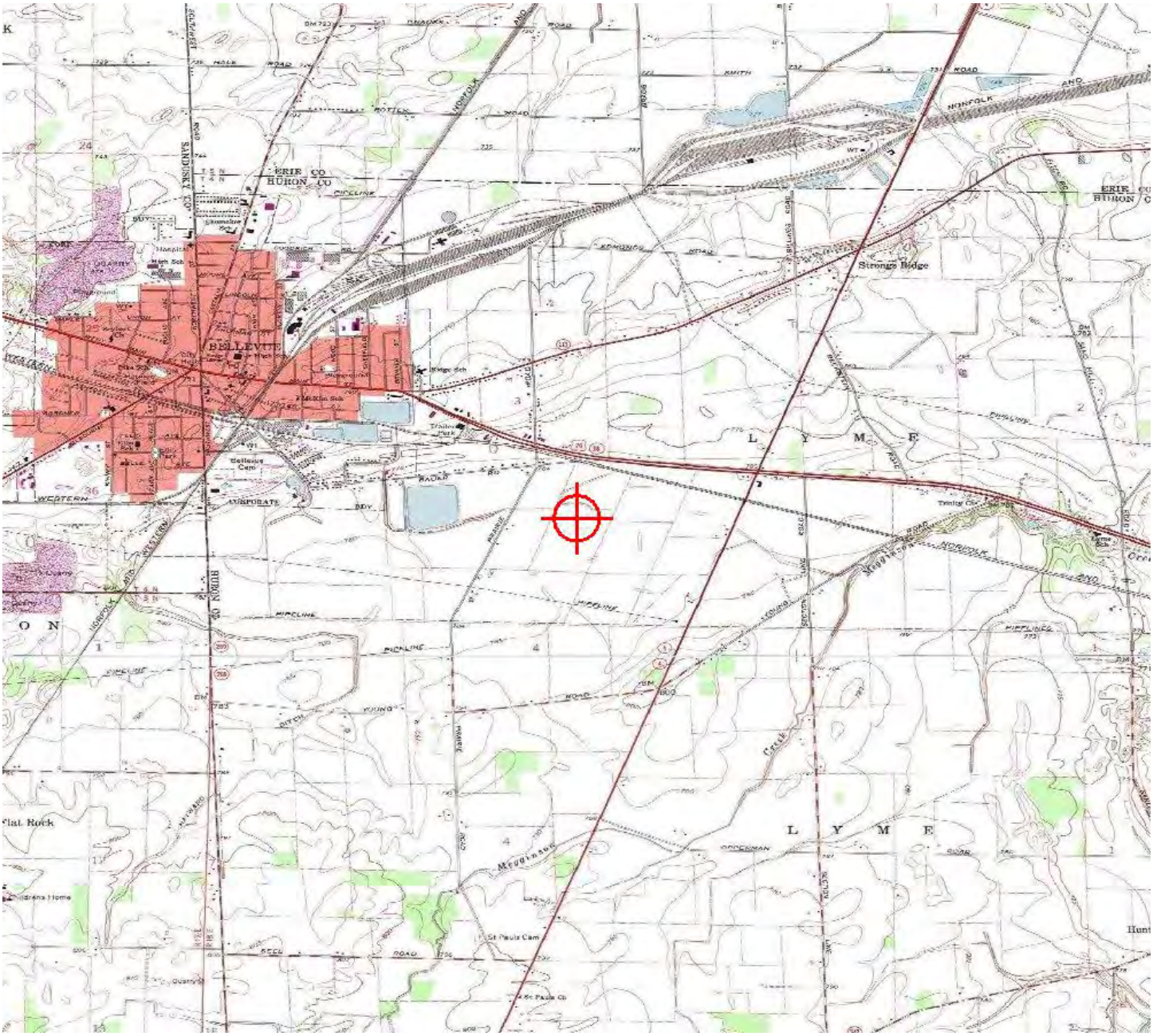
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

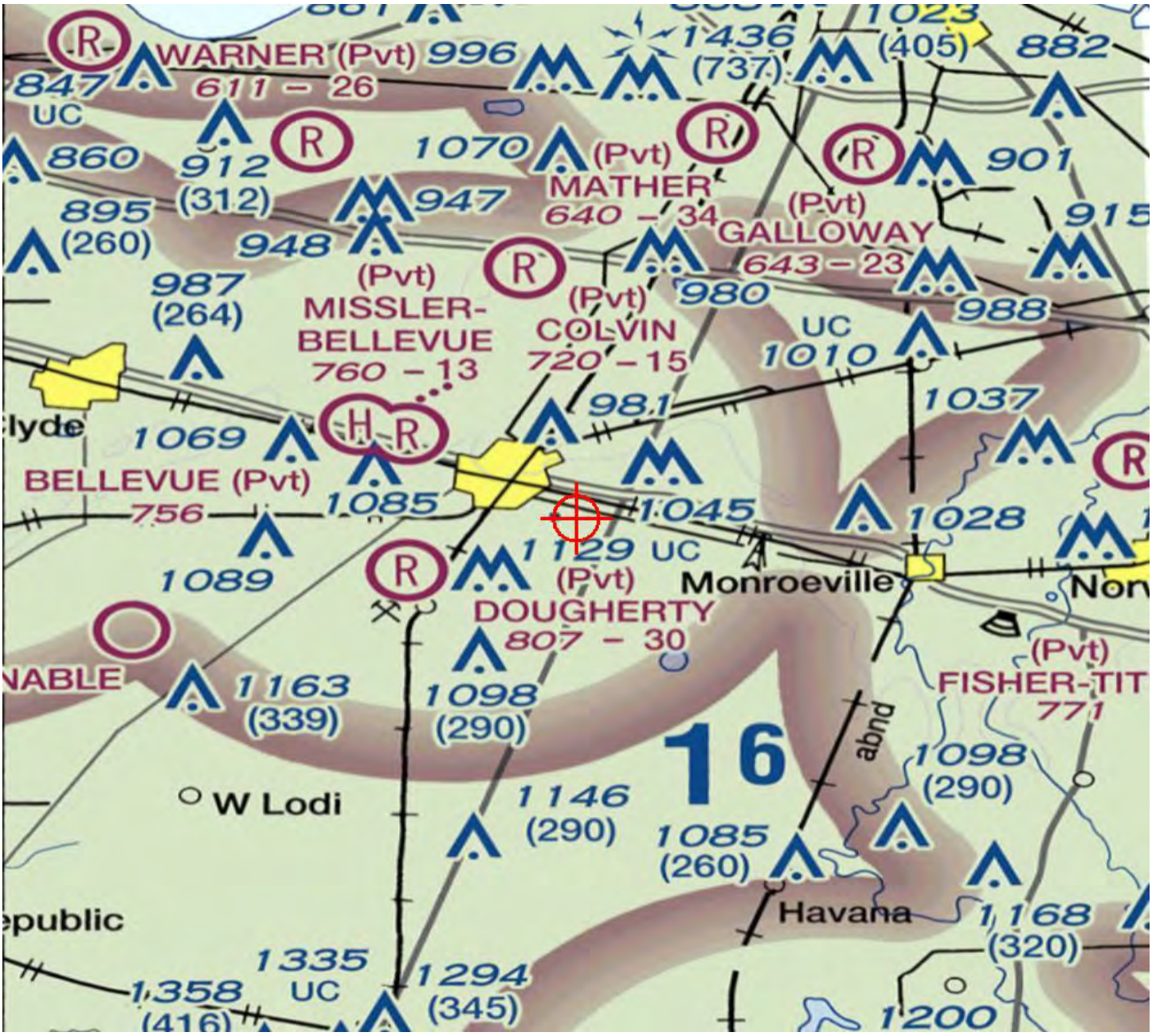
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11922-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11923-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T25
Location:	Bellevue, OH
Latitude:	41-15-24.83N NAD 83
Longitude:	82-48-41.23W
Heights:	780 feet site elevation (SE)
	659 feet above ground level (AGL)
	1439 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11923-OE.

Signature Control No: 392869074-430570288 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

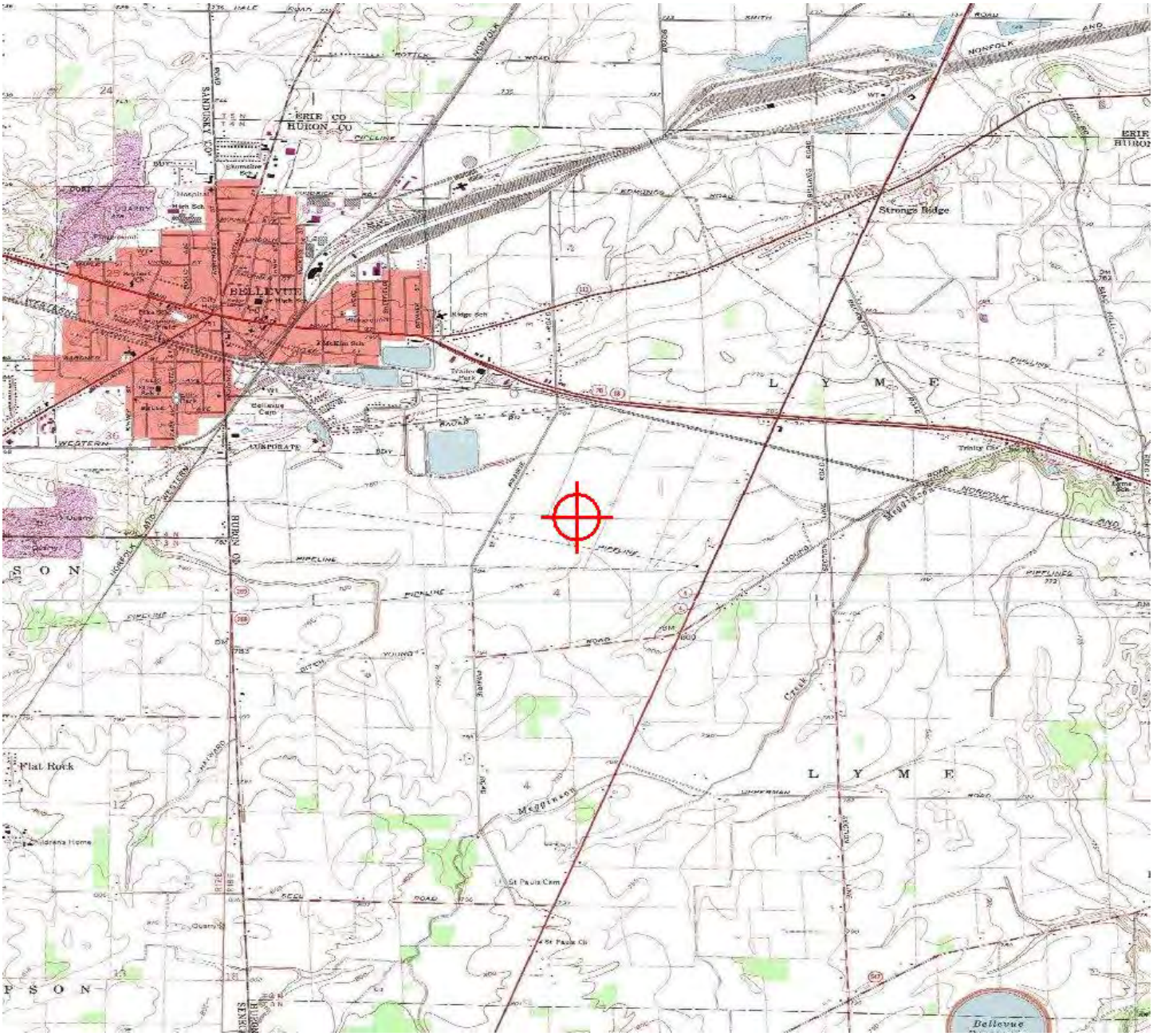
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

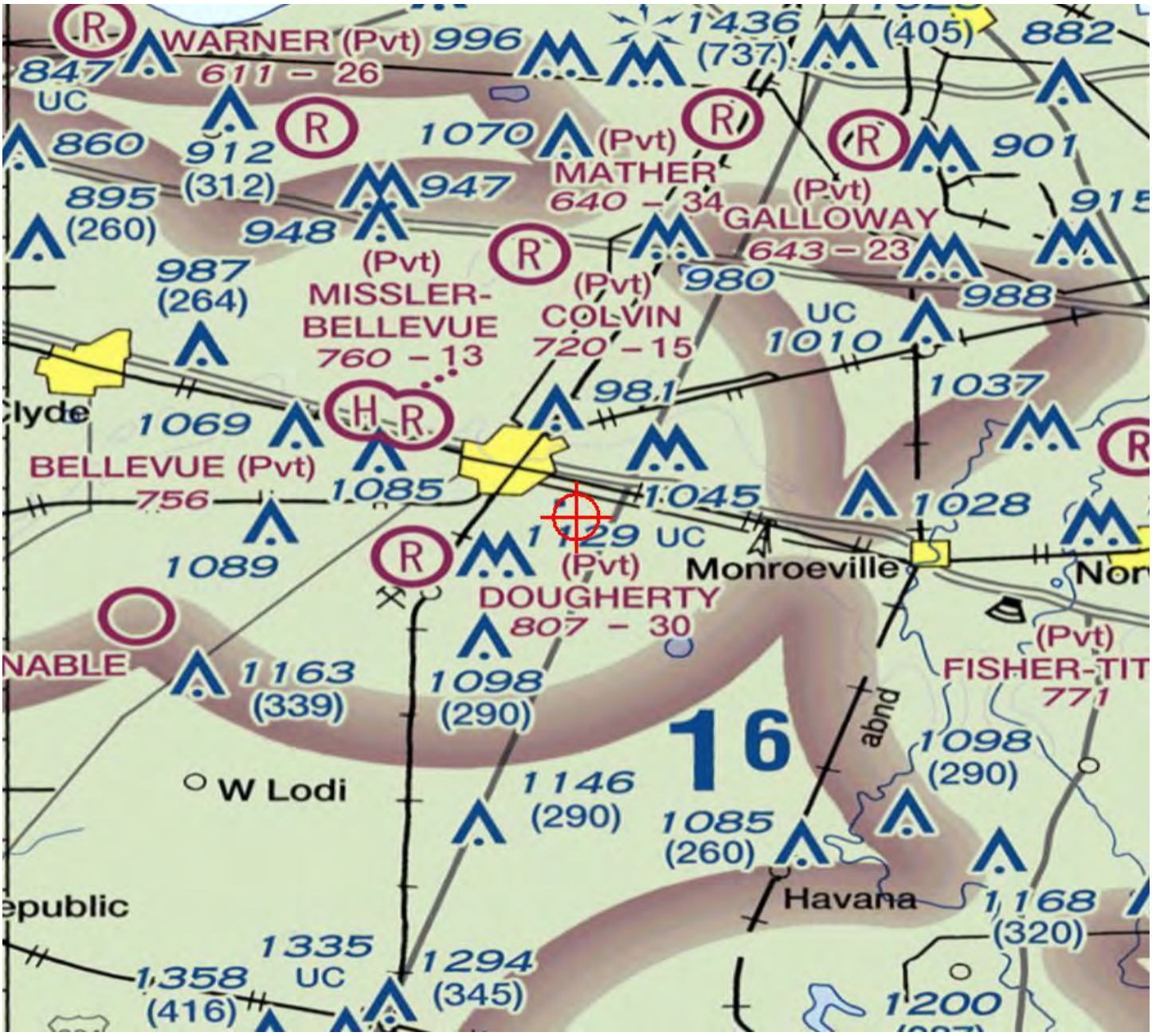
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11923-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11924-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T26
Location:	Bellevue, OH
Latitude:	41-15-19.91N NAD 83
Longitude:	82-48-17.28W
Heights:	784 feet site elevation (SE)
	659 feet above ground level (AGL)
	1443 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11924-OE.

Signature Control No: 392869075-430570289 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

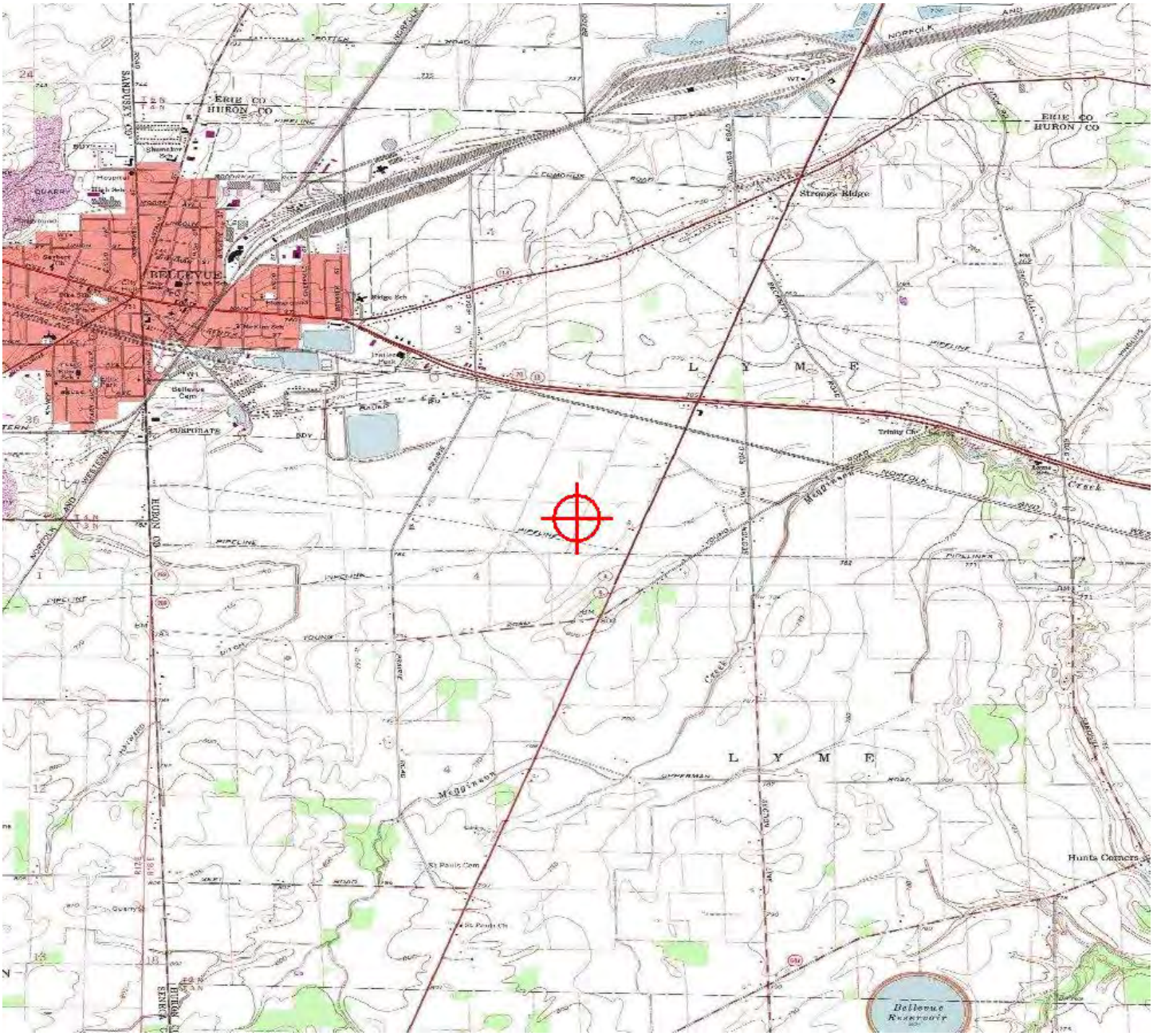
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

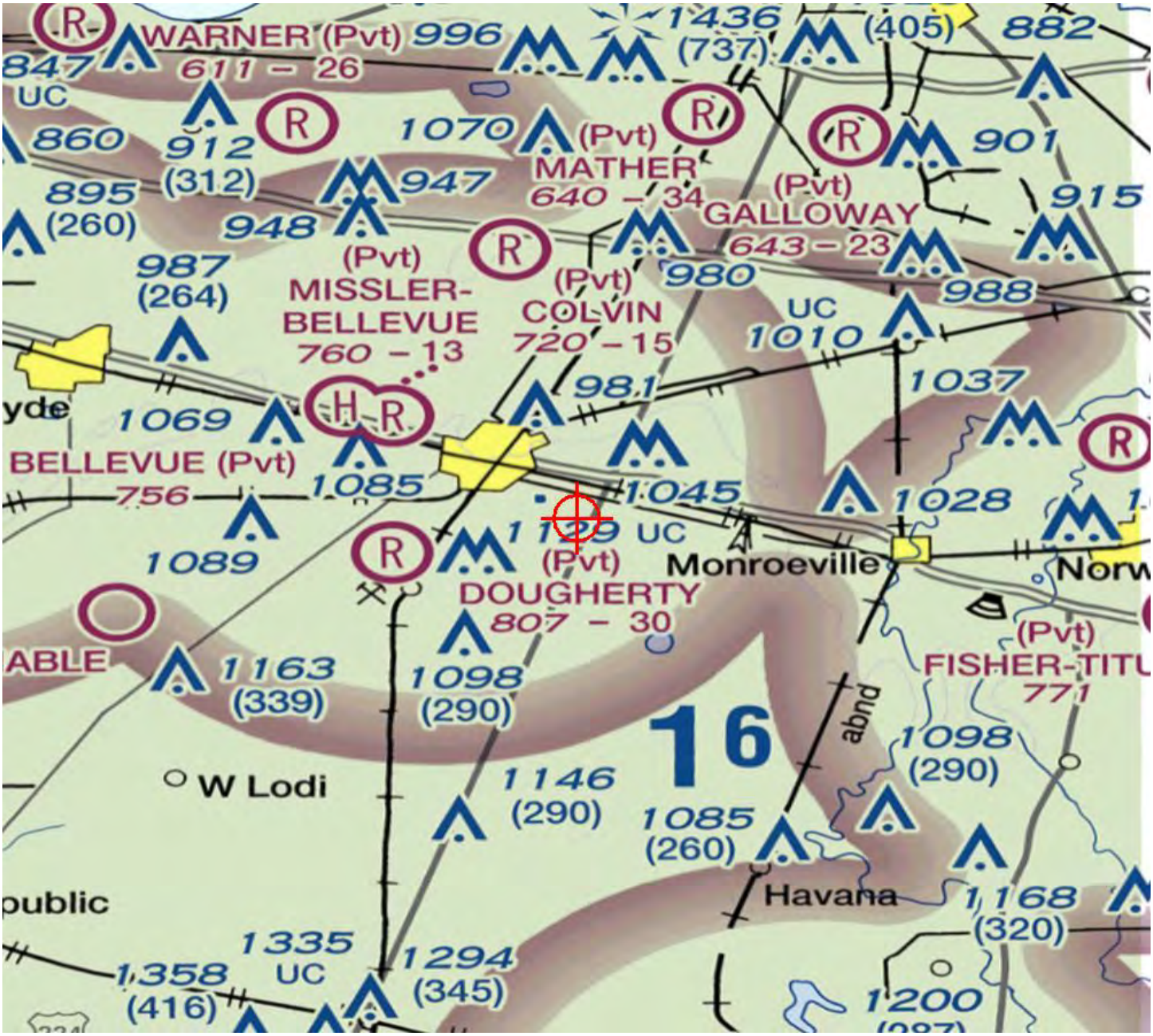
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11924-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11925-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T27
Location:	Bellevue, OH
Latitude:	41-14-51.86N NAD 83
Longitude:	82-46-32.11W
Heights:	776 feet site elevation (SE)
	659 feet above ground level (AGL)
	1435 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11925-OE.

Signature Control No: 392869077-430570203 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

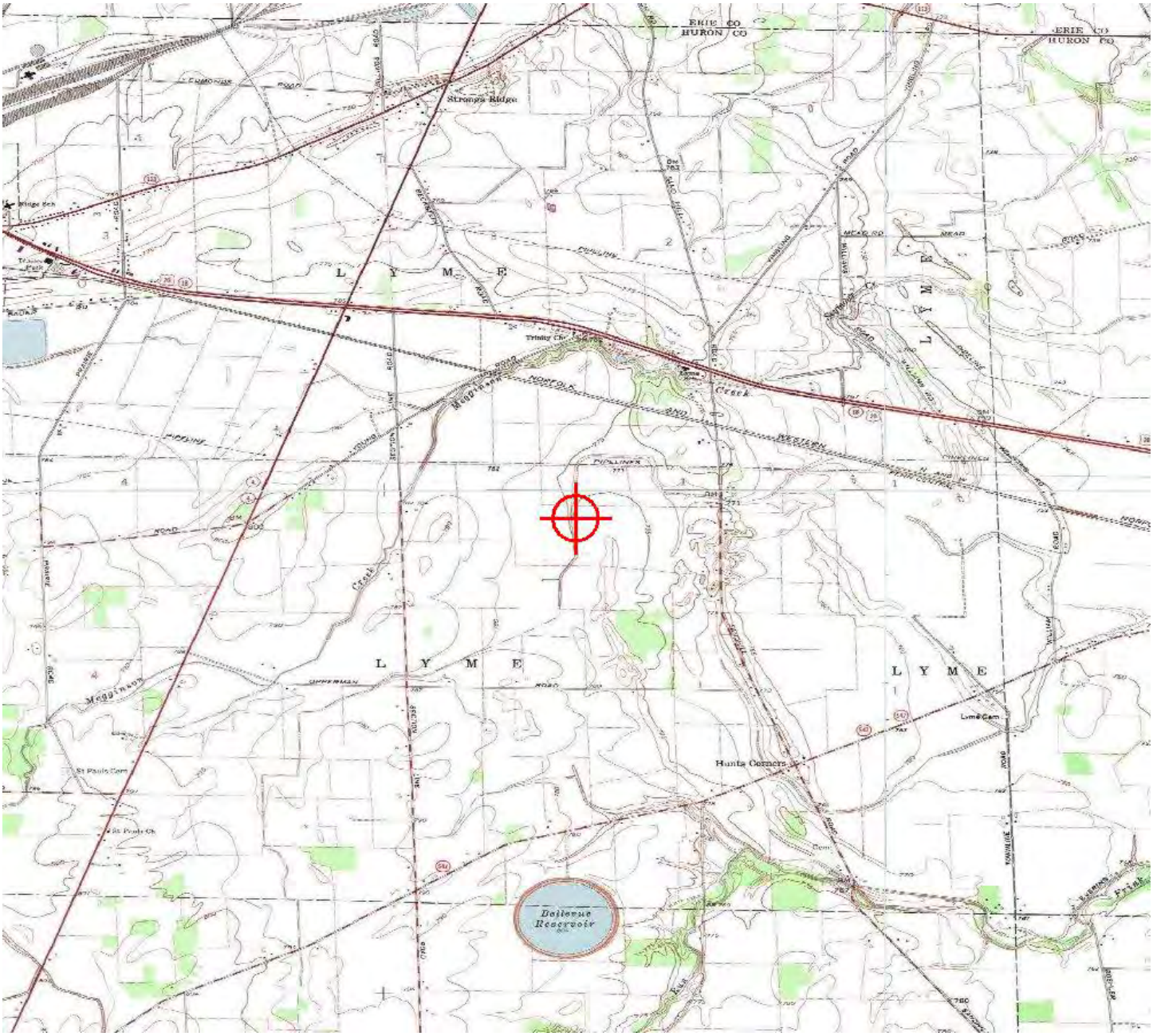
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

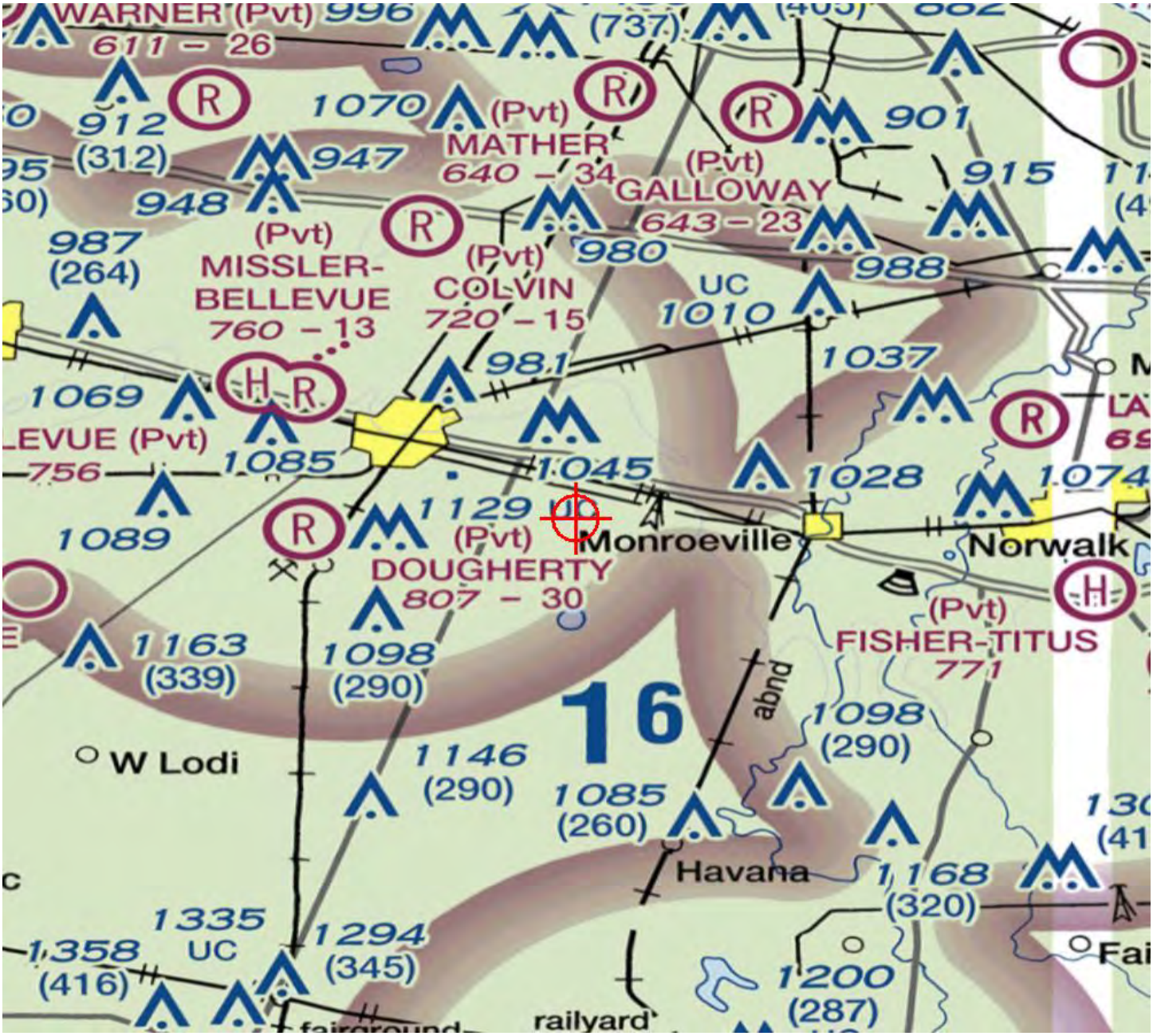
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11925-OE




WARNER (Pvt)
611 – 26
996
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MATHER
640 – 34
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948
(Pvt)
GALLOWAY
643 – 23
901
915
987
(264)
(Pvt)
MISSLER-
BELLEVUE
760 – 13
(Pvt)
COLVIN
720 – 15
980
988
UC
1010
98.1
1037
1069
1085
1045
1028
1074
1089
1129
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
(Pvt)
FISHER-TITUS
771
1163
(339)
1098
(290)
16
abnd
1098
(290)
W Lodi
1146
(290)
1085
(260)
Havana
1168
(320)
1335
UC
1358
(416)
1294
(345)
1200
(287)
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11926-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T28
Location:	Bellevue, OH
Latitude:	41-14-50.80N NAD 83
Longitude:	82-45-19.11W
Heights:	758 feet site elevation (SE)
	659 feet above ground level (AGL)
	1417 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11926-OE.

Signature Control No: 392869078-430570307 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

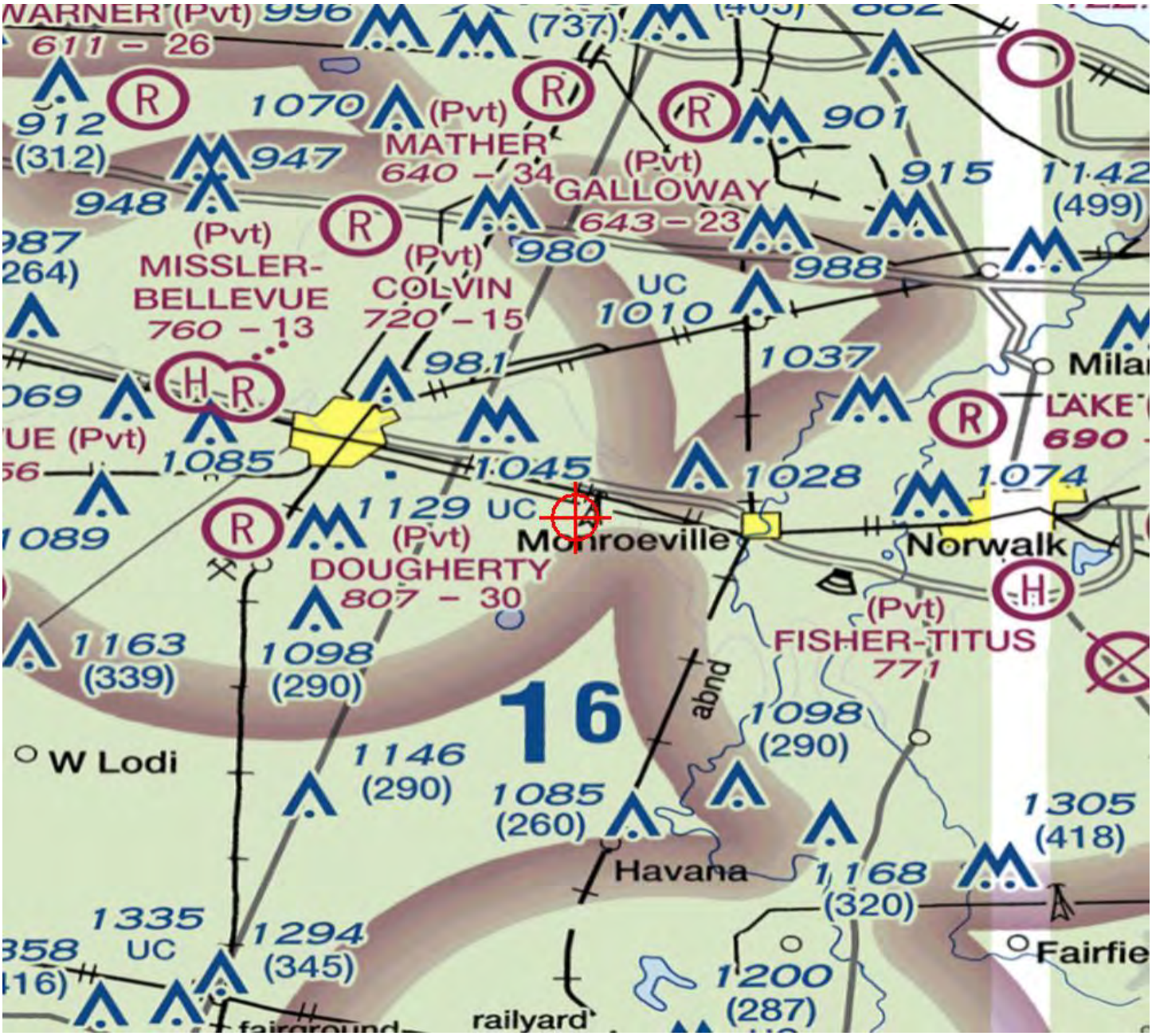
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11926-OE

Sectional Map for ASN 2018-WTE-11926-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11927-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T29
Location:	Bellevue, OH
Latitude:	41-14-45.63N NAD 83
Longitude:	82-47-48.58W
Heights:	788 feet site elevation (SE)
	659 feet above ground level (AGL)
	1447 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11927-OE.

Signature Control No: 392869079-430570473 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

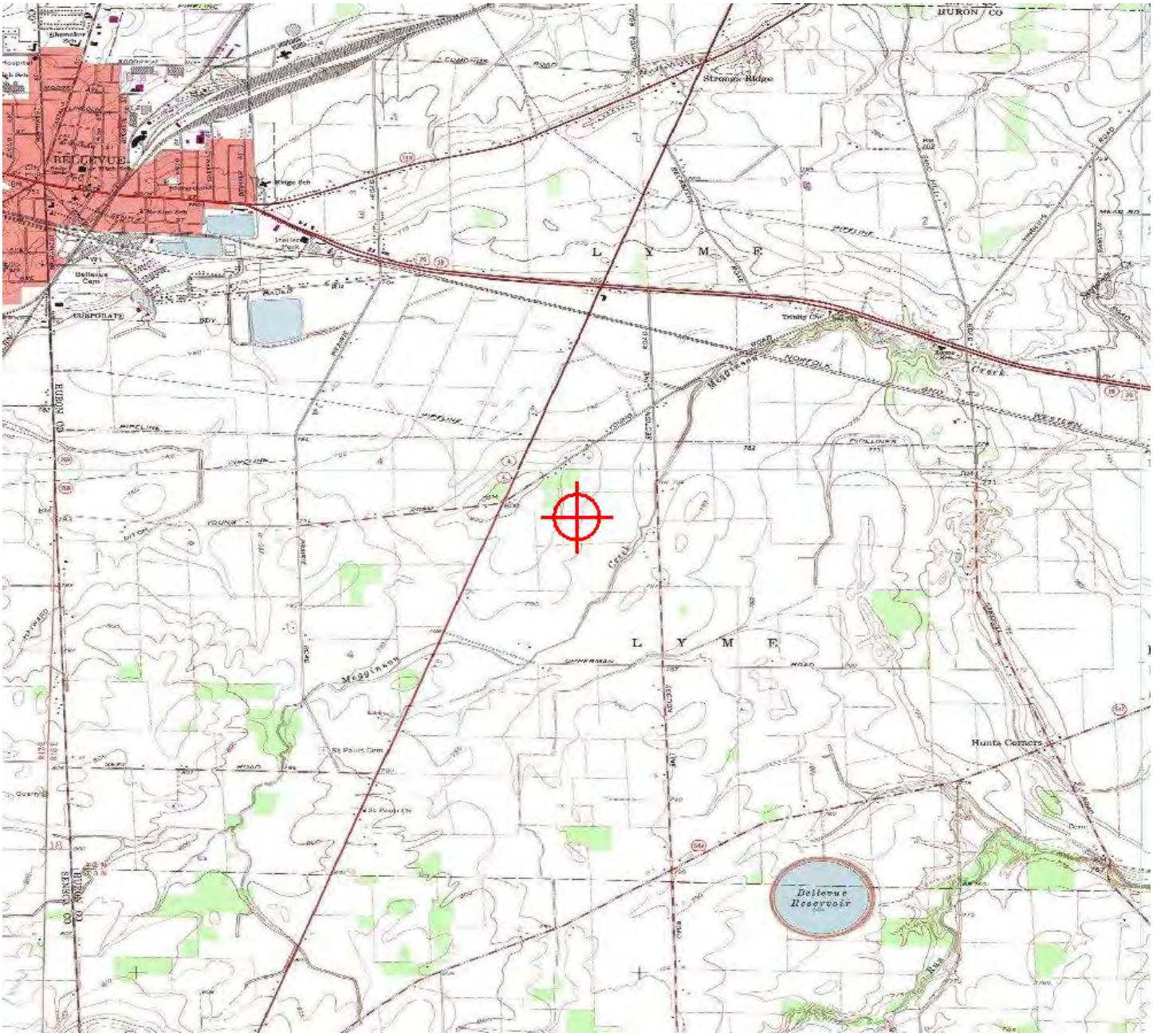
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

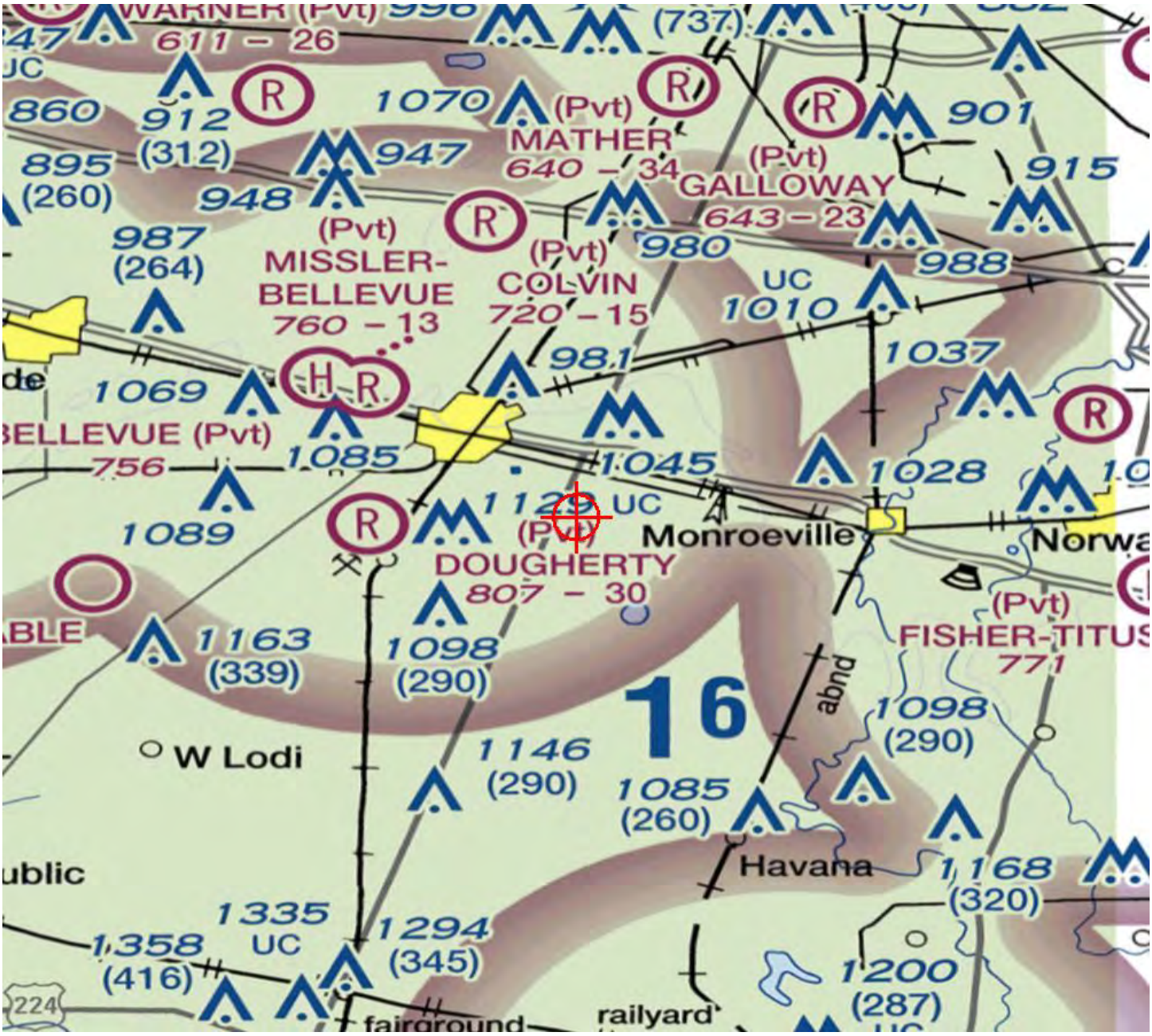
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11927-OE



Sectional Map for ASN 2018-WTE-11927-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11929-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T30
Location:	Bellevue, OH
Latitude:	41-14-40.17N NAD 83
Longitude:	82-46-16.48W
Heights:	776 feet site elevation (SE)
	659 feet above ground level (AGL)
	1435 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11929-OE.

Signature Control No: 392869081-430570479 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

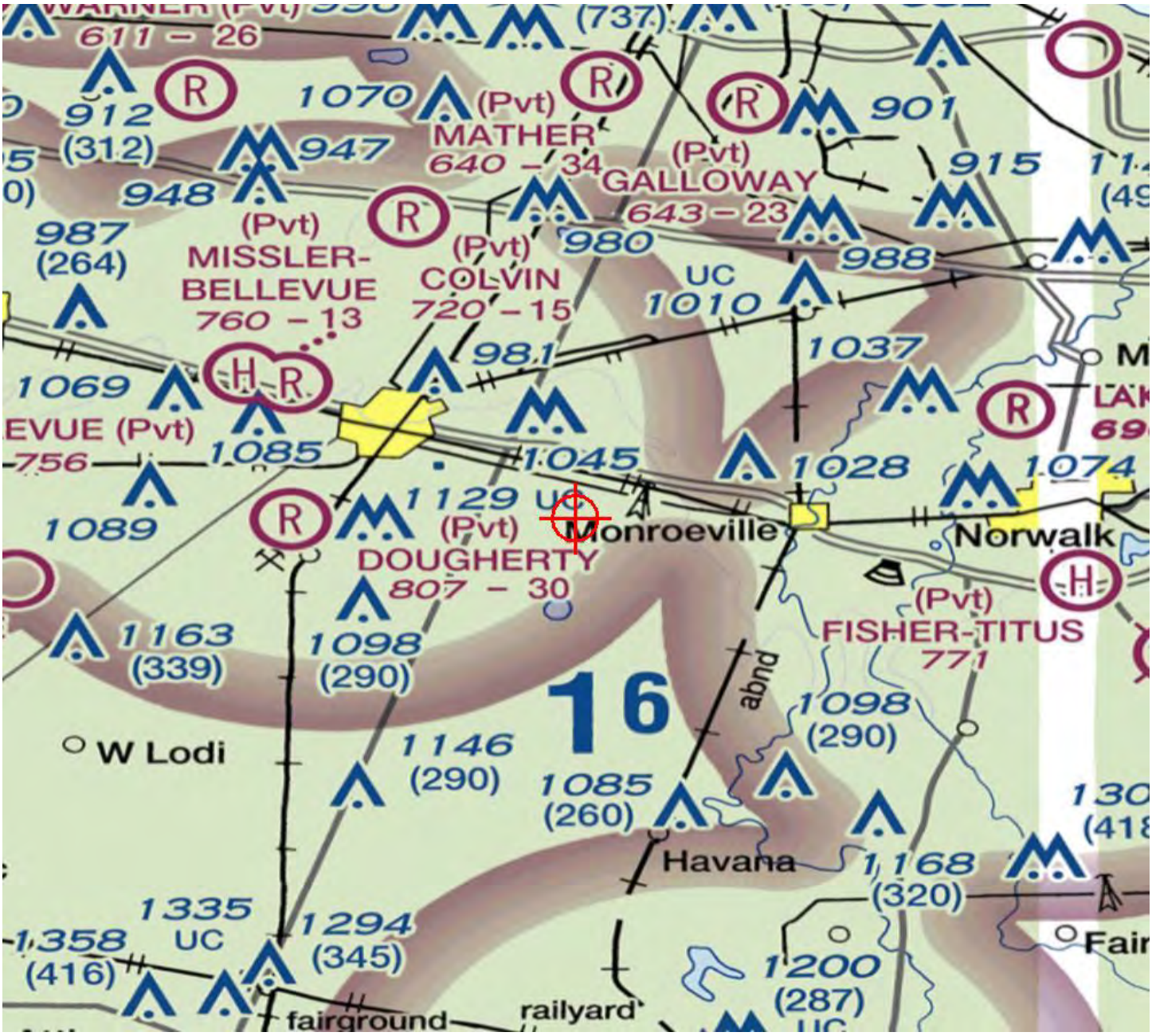
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11929-OE


611 – 26
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fairground
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11930-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T31
Location:	Bellevue, OH
Latitude:	41-14-39.51N NAD 83
Longitude:	82-45-07.90W
Heights:	756 feet site elevation (SE)
	659 feet above ground level (AGL)
	1415 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11930-OE.

Signature Control No: 392869082-430570486 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

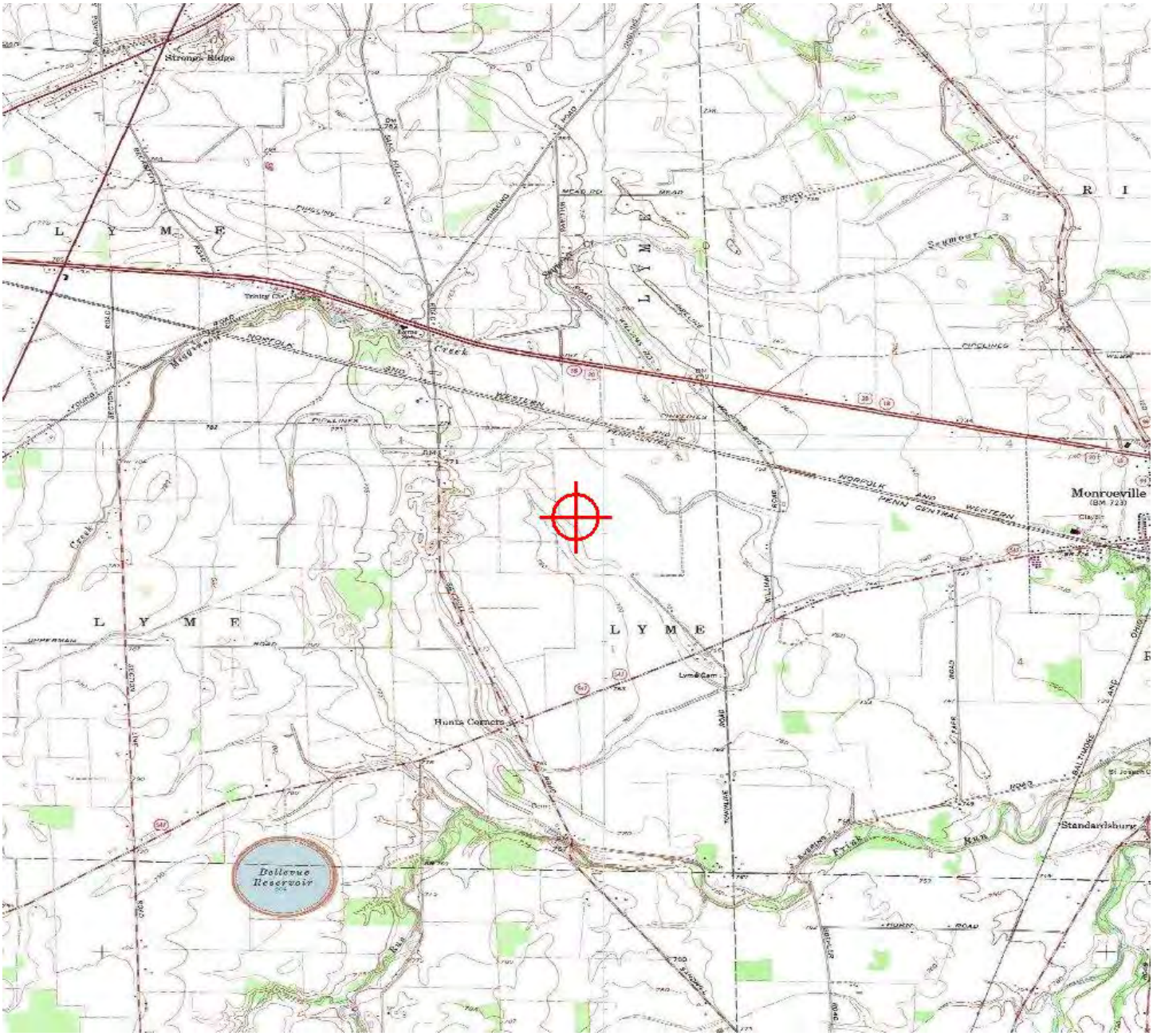
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

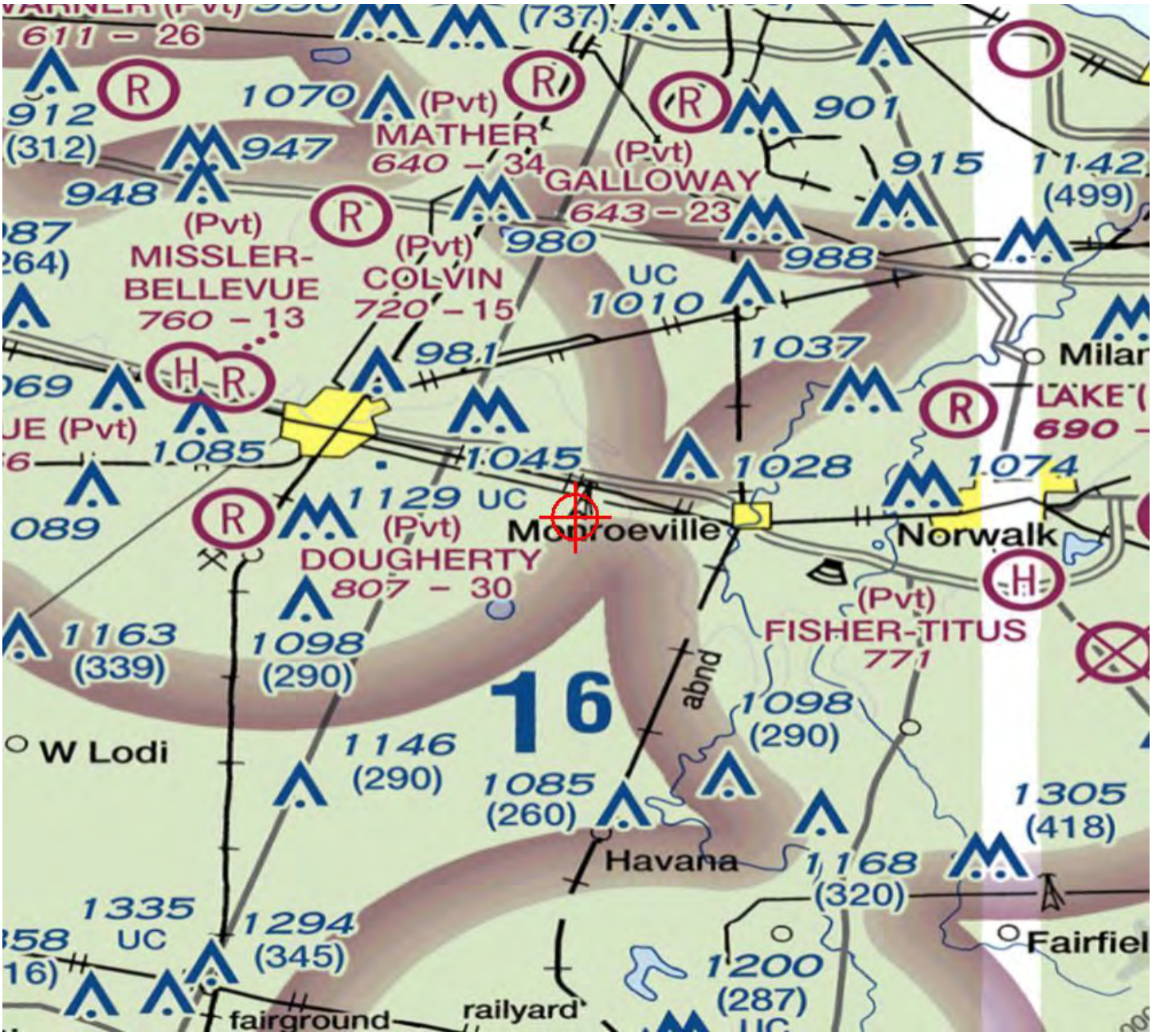
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11930-OE

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fairground
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11931-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T32
Location:	Bellevue, OH
Latitude:	41-14-32.40N NAD 83
Longitude:	82-47-52.63W
Heights:	788 feet site elevation (SE)
	659 feet above ground level (AGL)
	1447 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11931-OE.

Signature Control No: 392869083-430570489 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

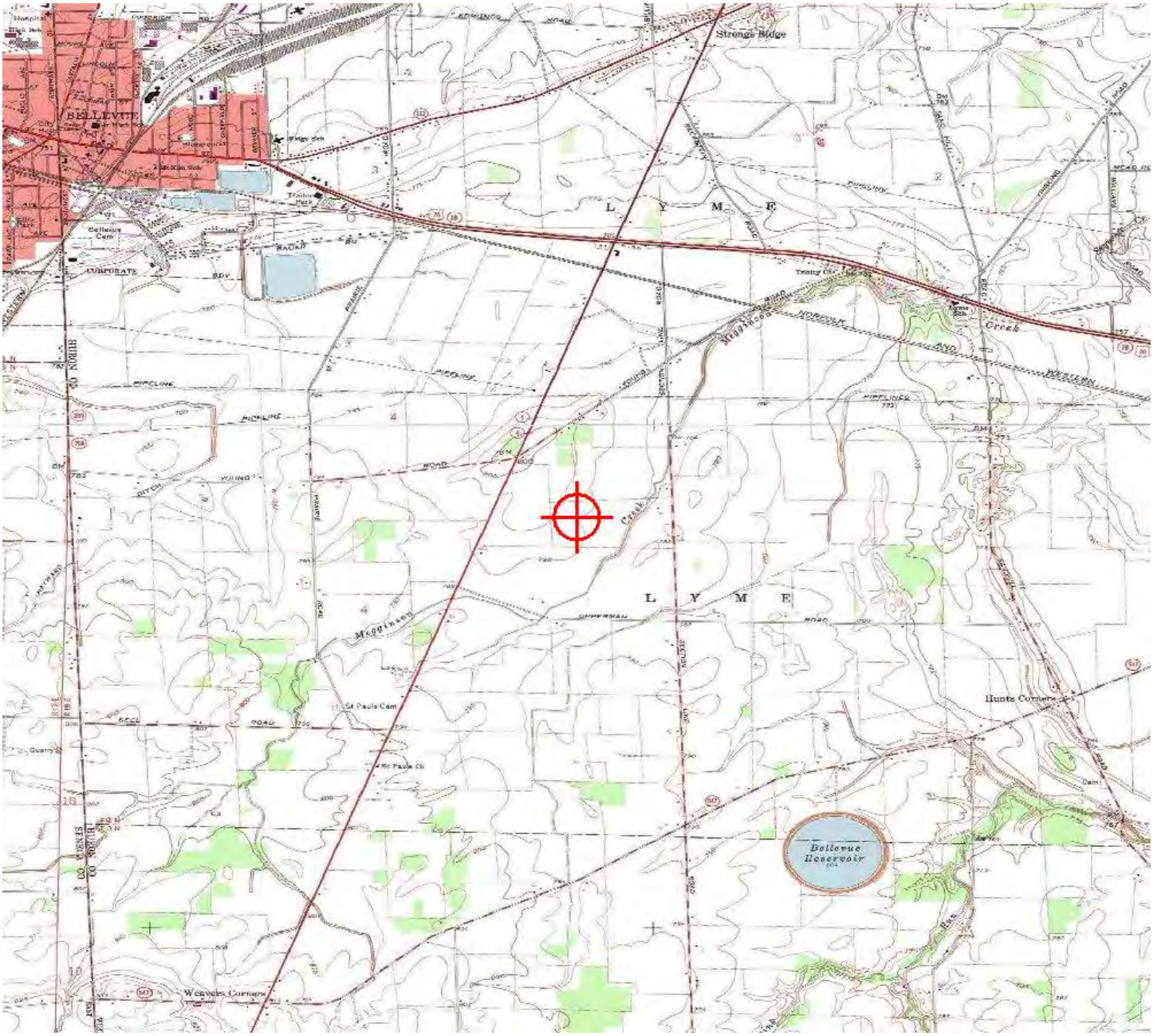
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

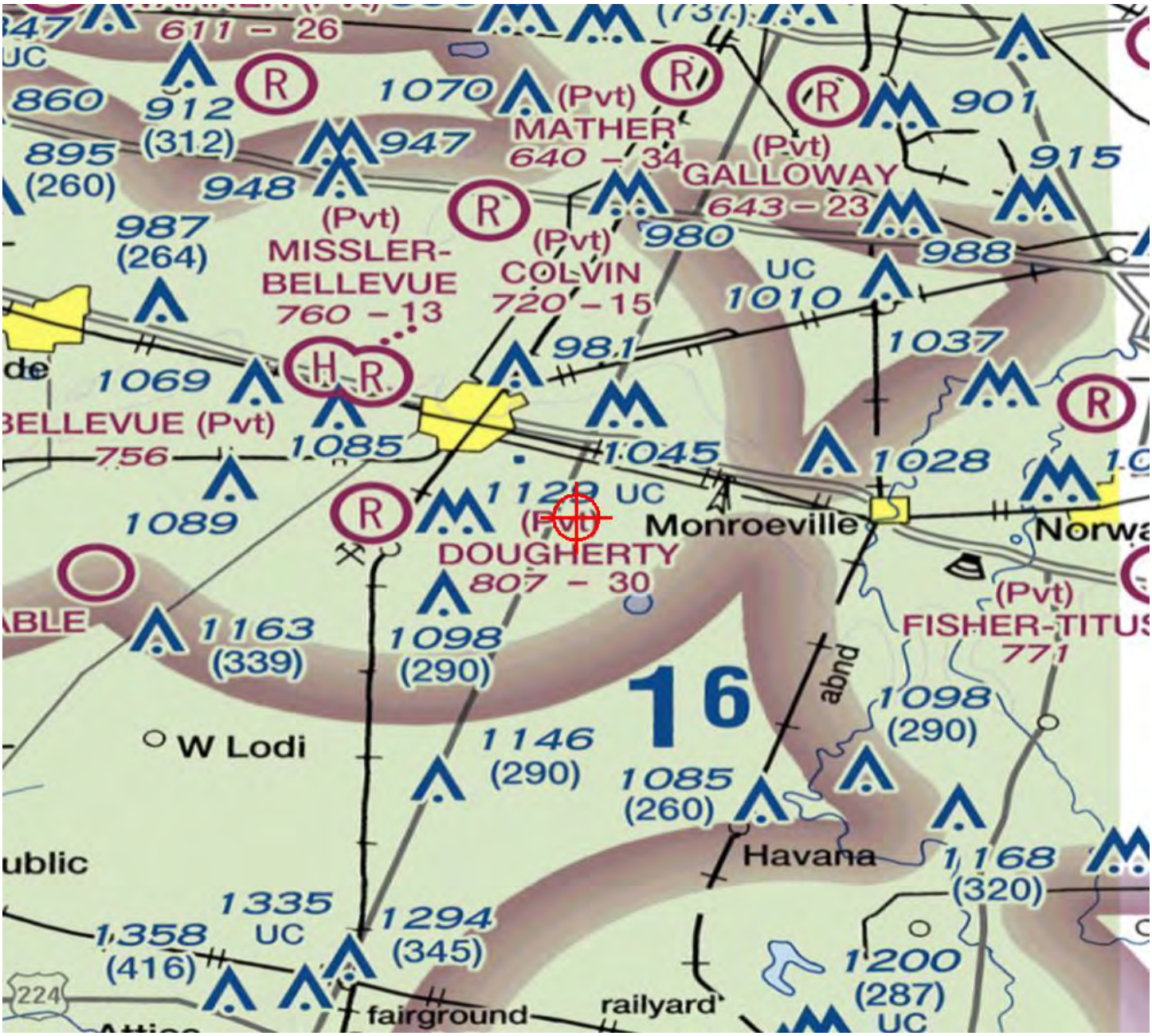
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11931-OE

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1200
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UC
224
fairground
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11932-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T33
Location:	Bellevue, OH
Latitude:	41-14-31.14N NAD 83
Longitude:	82-44-40.06W
Heights:	752 feet site elevation (SE)
	659 feet above ground level (AGL)
	1411 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11932-OE.

Signature Control No: 392869084-430570524 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

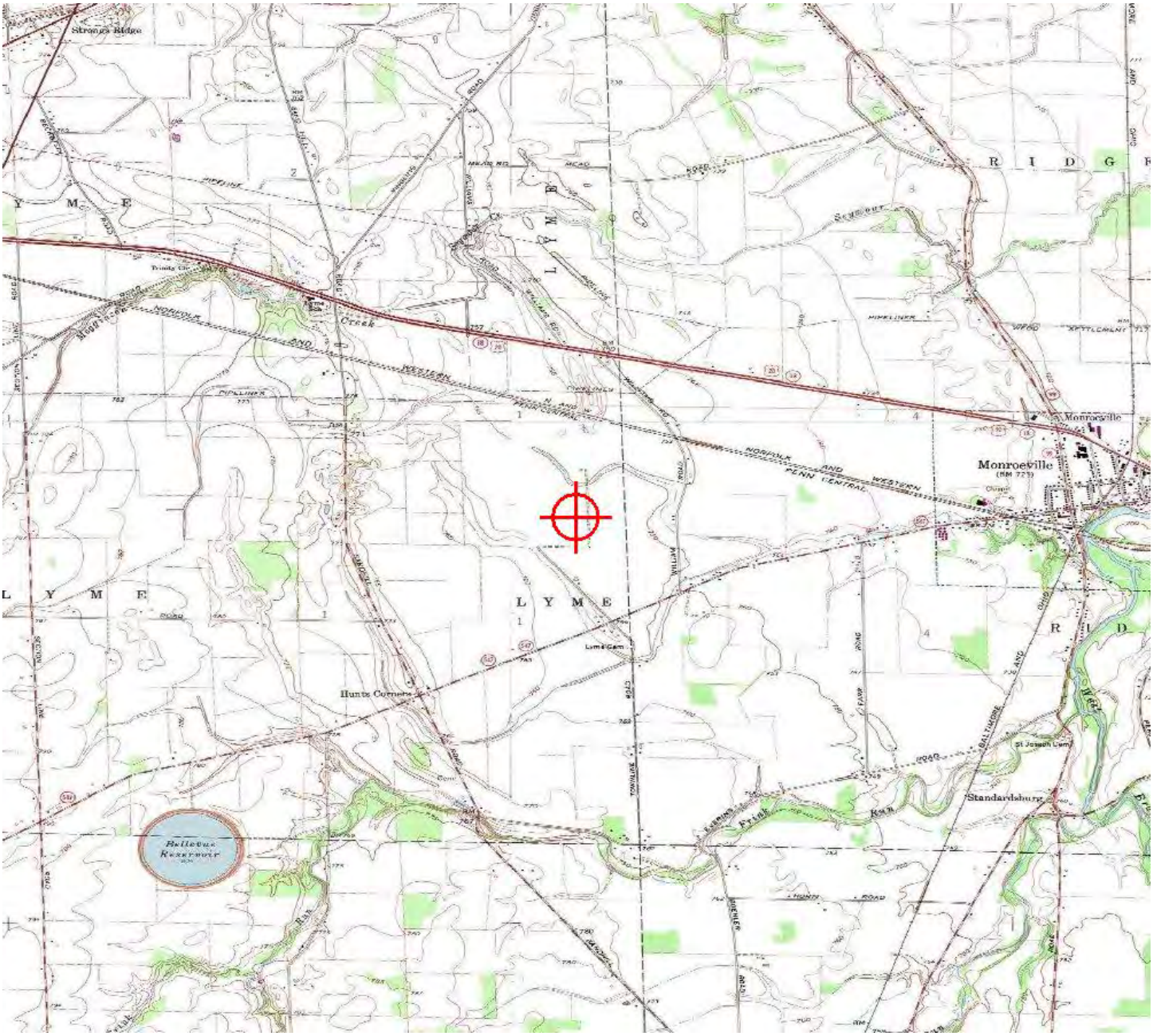
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

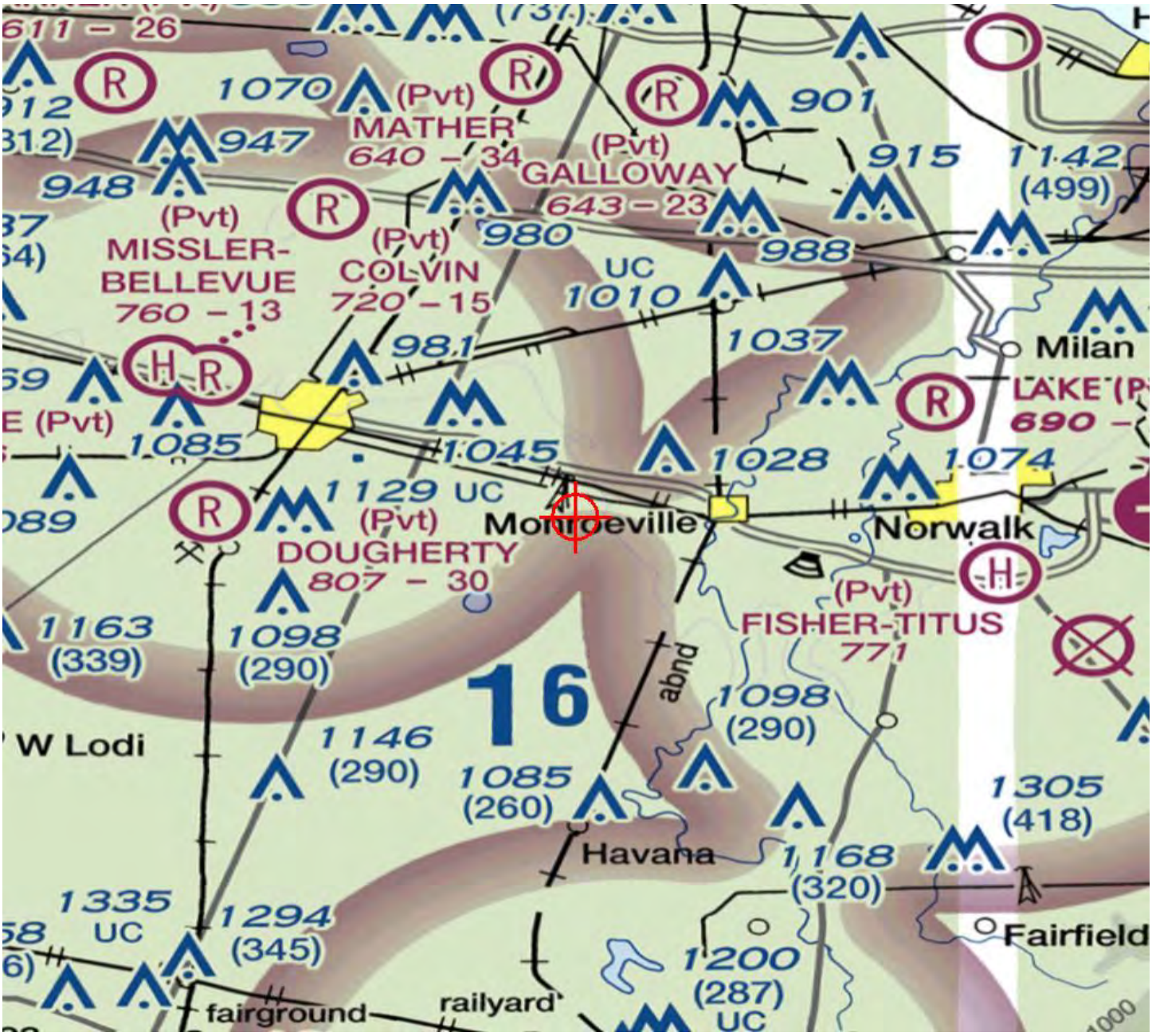
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11932-OE




611 – 26
1070
(Pvt)
MATHER
640 – 34
901
947
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GALLOWAY
643 – 23
915
1142
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948
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MISSLER-
BELLEVUE
760 – 13
(Pvt)
COLVIN
720 – 15
980
988
UC
1010
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1037
Milan
1085
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1129 UC
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DOUGHERTY
807 – 30
Monroeville
Norwalk
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771
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(290)
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(290)
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1305
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Havana
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UC
1294
(345)
Fairfield
1200
(287)
UC
fairground
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11933-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T34
Location:	Bellevue, OH
Latitude:	41-14-25.33N NAD 83
Longitude:	82-49-55.61W
Heights:	786 feet site elevation (SE)
	659 feet above ground level (AGL)
	1445 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11933-OE.

Signature Control No: 392869085-430570528 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

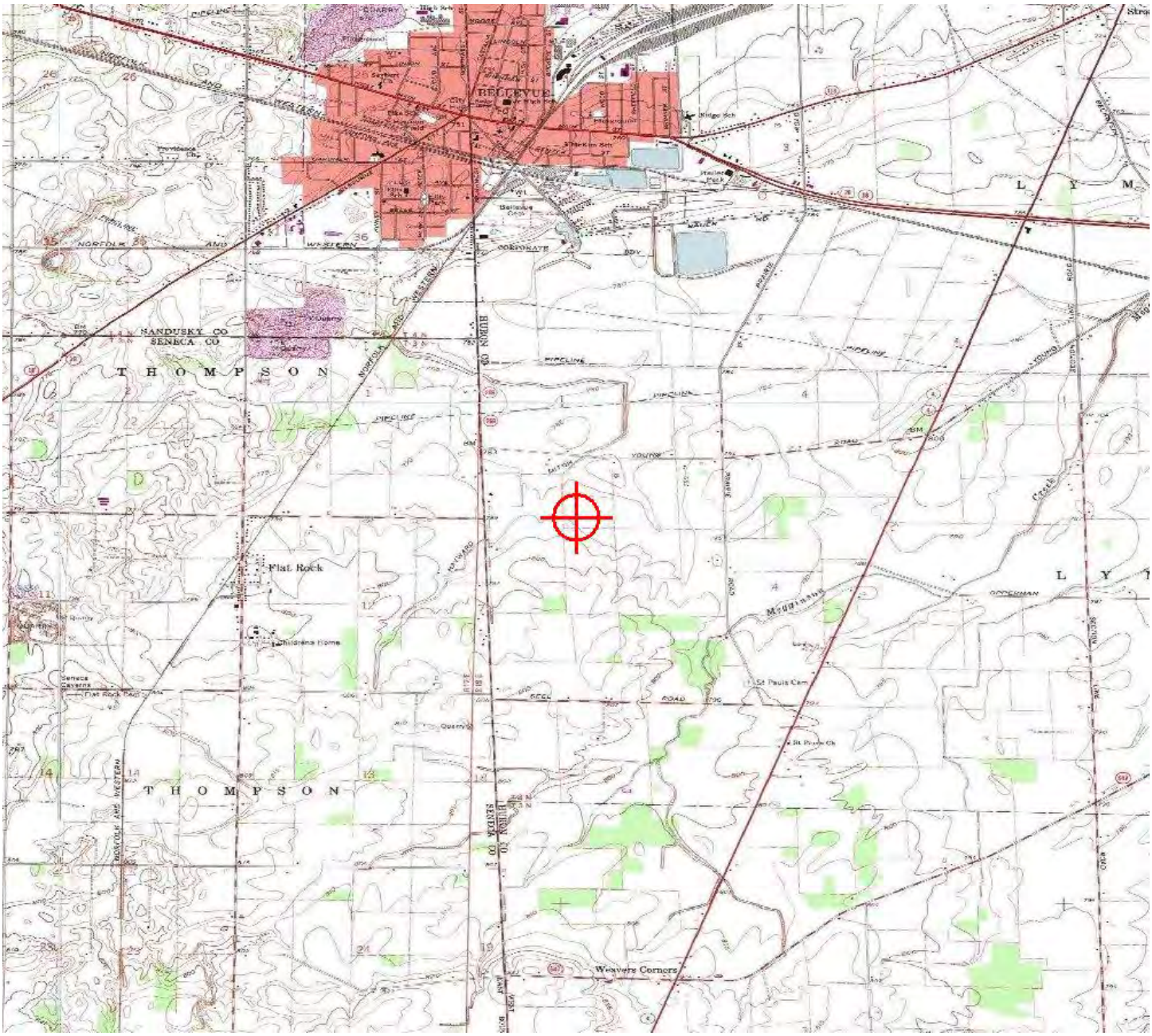
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

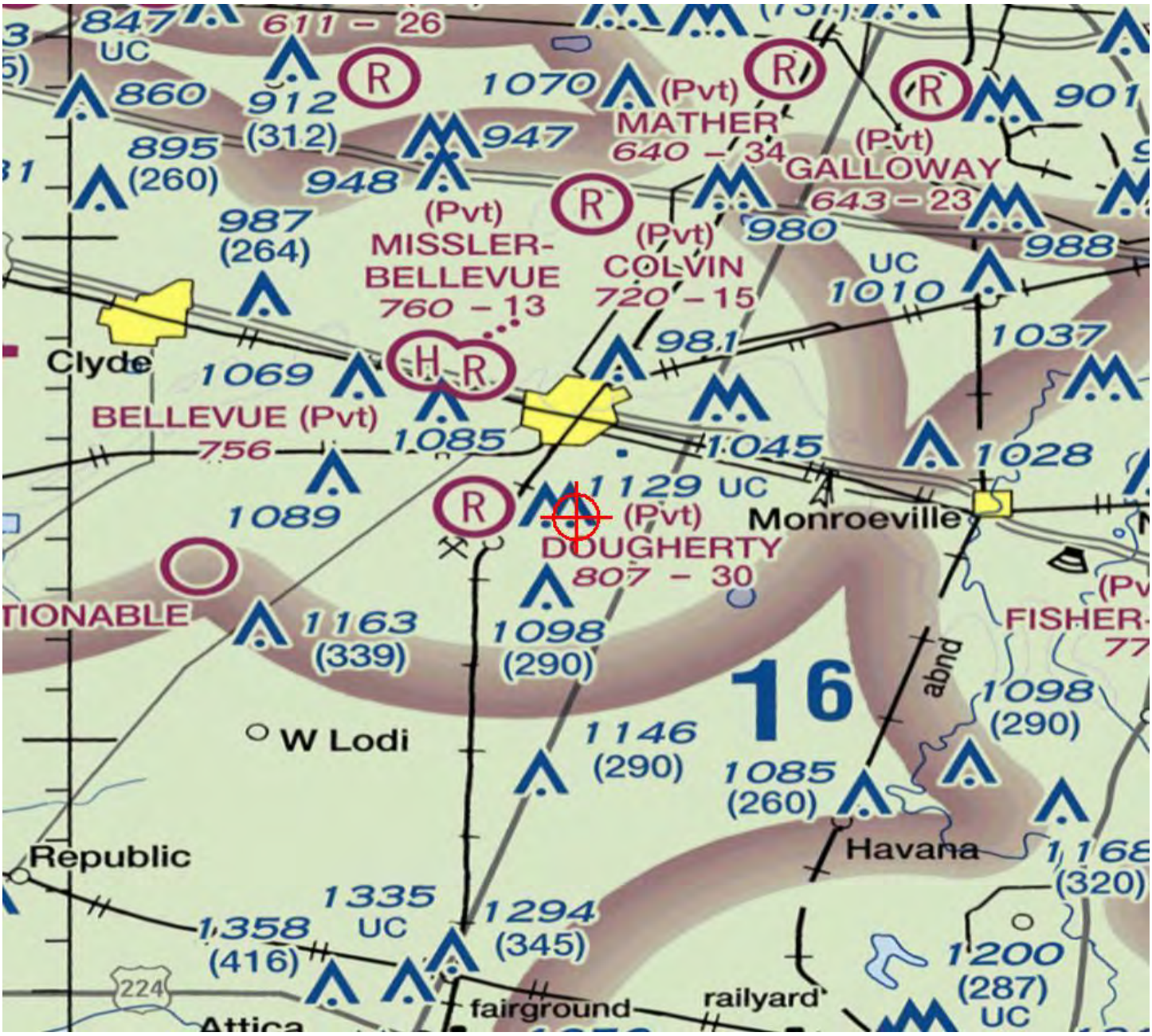
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11933-OE

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fairground
railyard
Attica

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11934-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T35
Location:	Bellevue, OH
Latitude:	41-14-17.41N NAD 83
Longitude:	82-46-15.83W
Heights:	774 feet site elevation (SE)
	659 feet above ground level (AGL)
	1433 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11934-OE.

Signature Control No: 392869086-430570540 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
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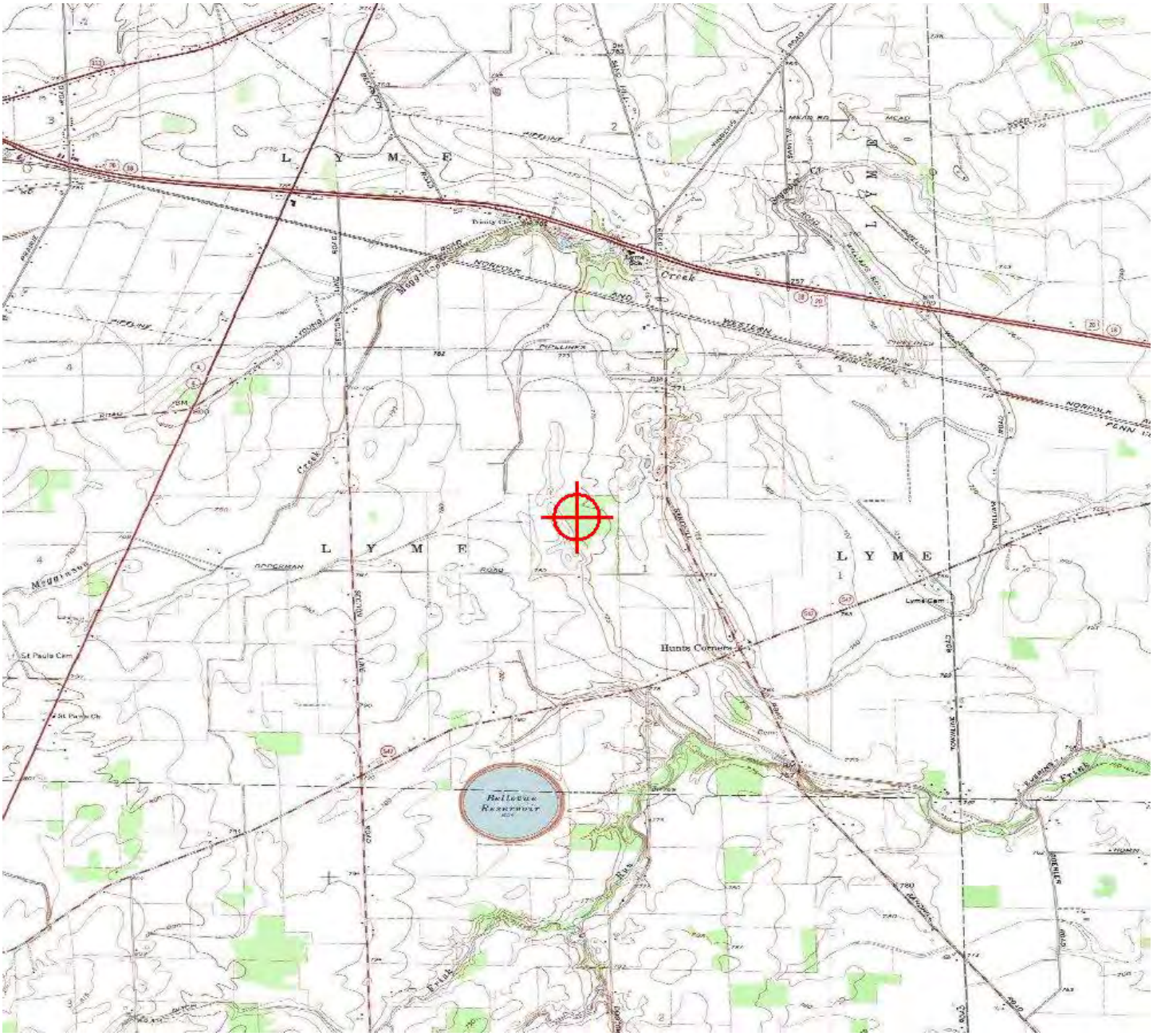
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

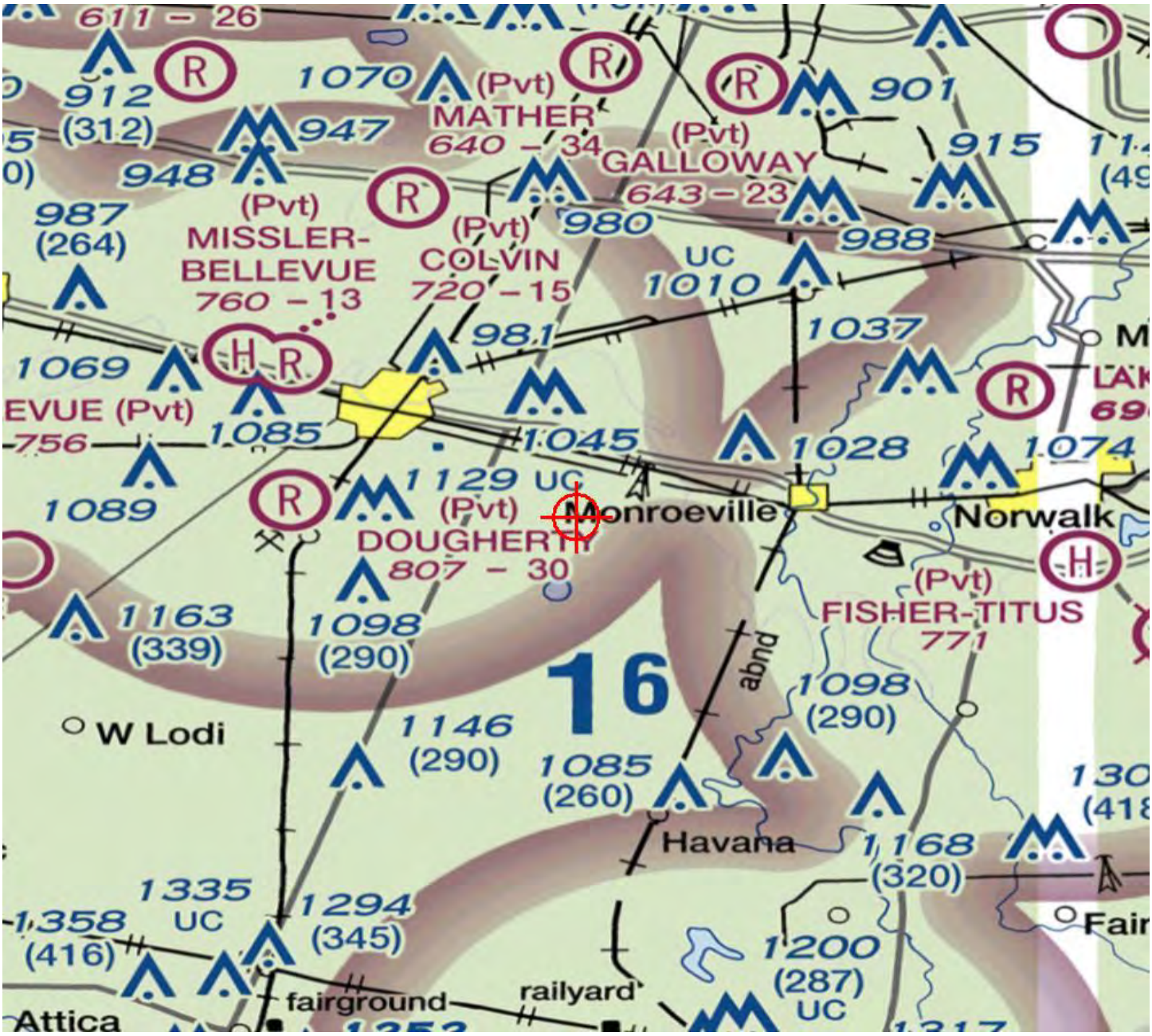
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11934-OE

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(345)
1200
(287)
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fairground
railyard
Attica

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11935-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T36
Location:	Bellevue, OH
Latitude:	41-14-16.85N NAD 83
Longitude:	82-45-03.60W
Heights:	758 feet site elevation (SE)
	659 feet above ground level (AGL)
	1417 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11935-OE.

Signature Control No: 392869087-430570555 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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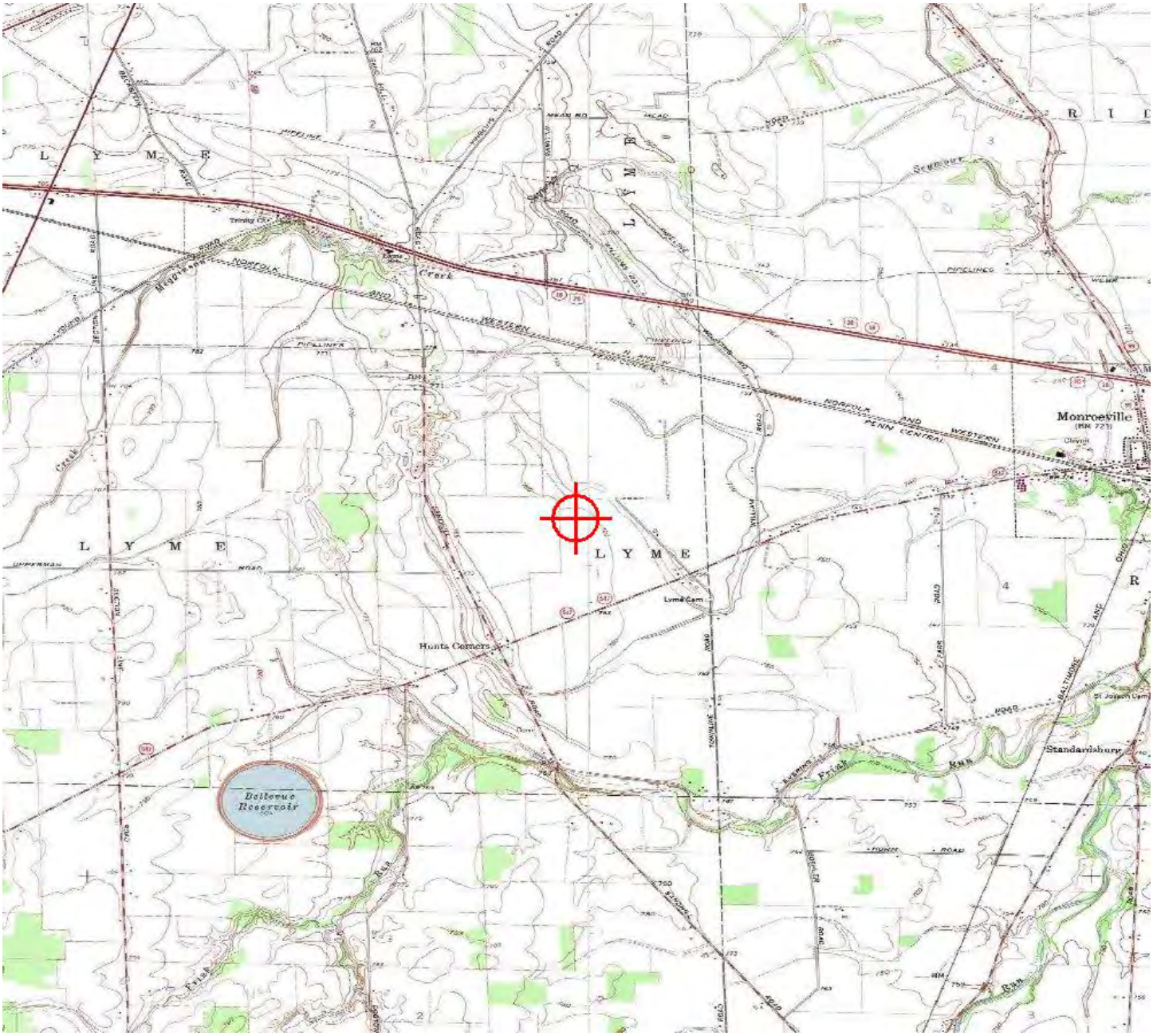
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

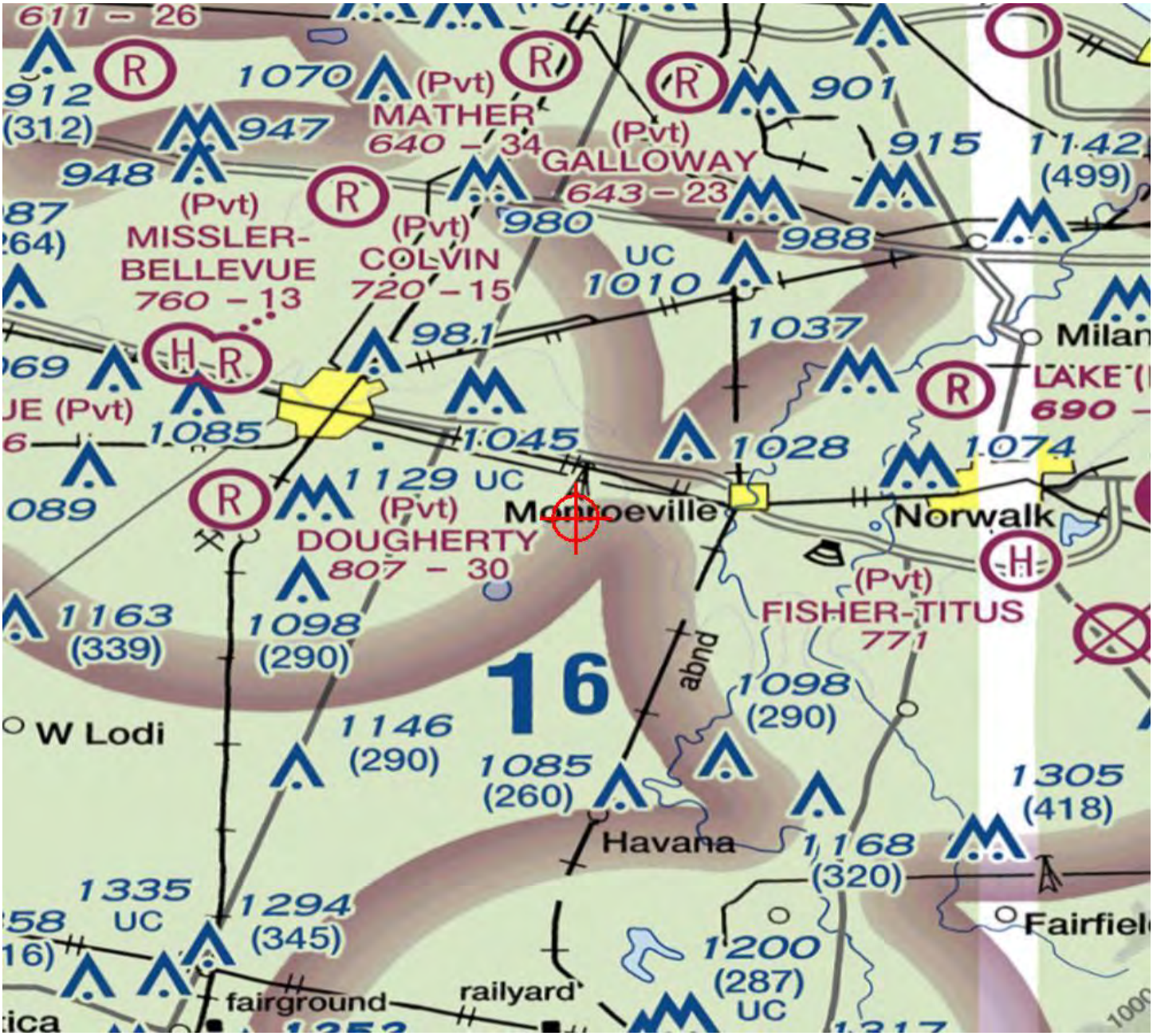
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11935-OE

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fairground
railyard

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11936-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T37
Location:	Bellevue, OH
Latitude:	41-14-09.25N NAD 83
Longitude:	82-49-34.69W
Heights:	792 feet site elevation (SE)
	659 feet above ground level (AGL)
	1451 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11936-OE.

Signature Control No: 392869088-430570564 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

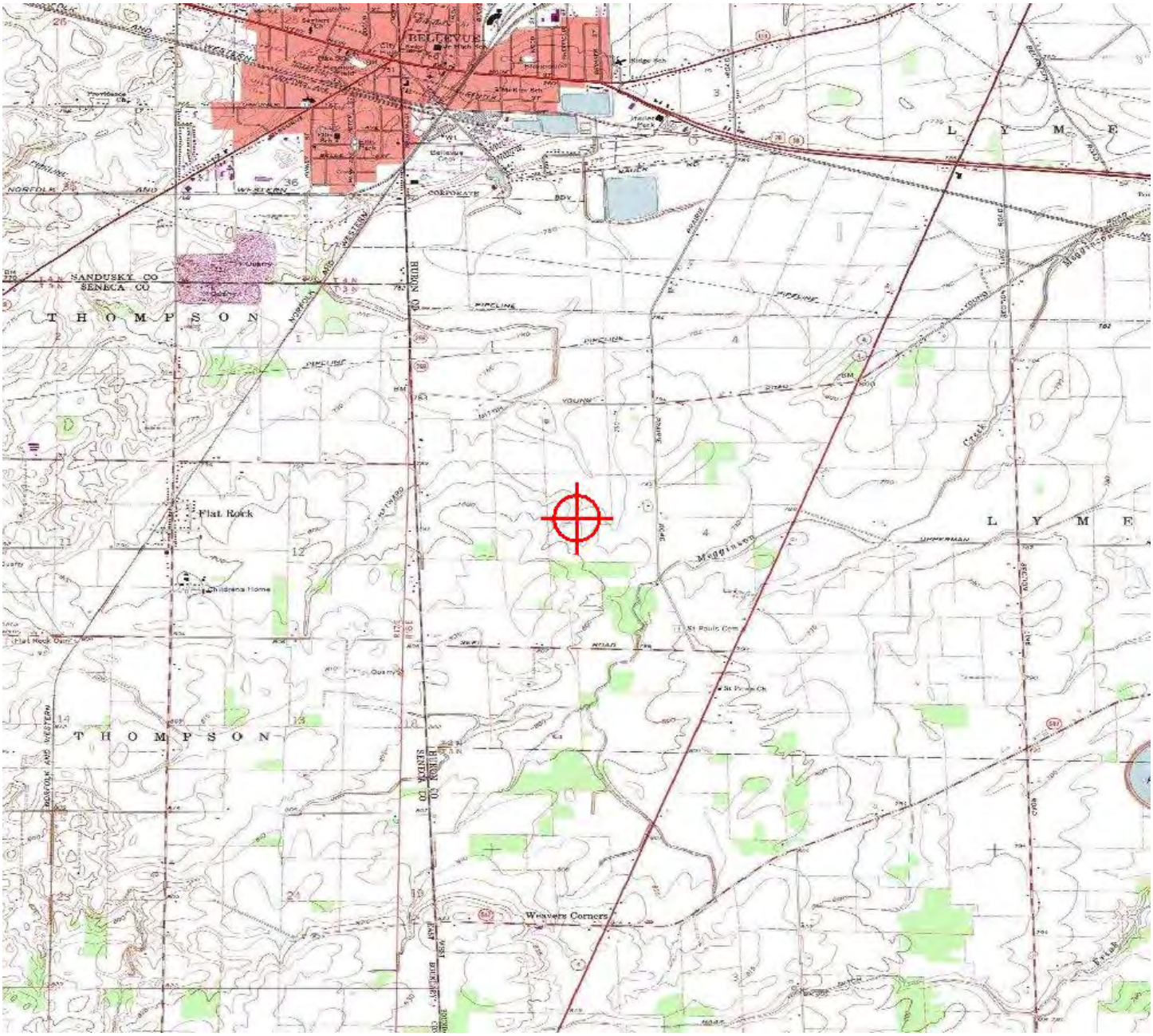
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

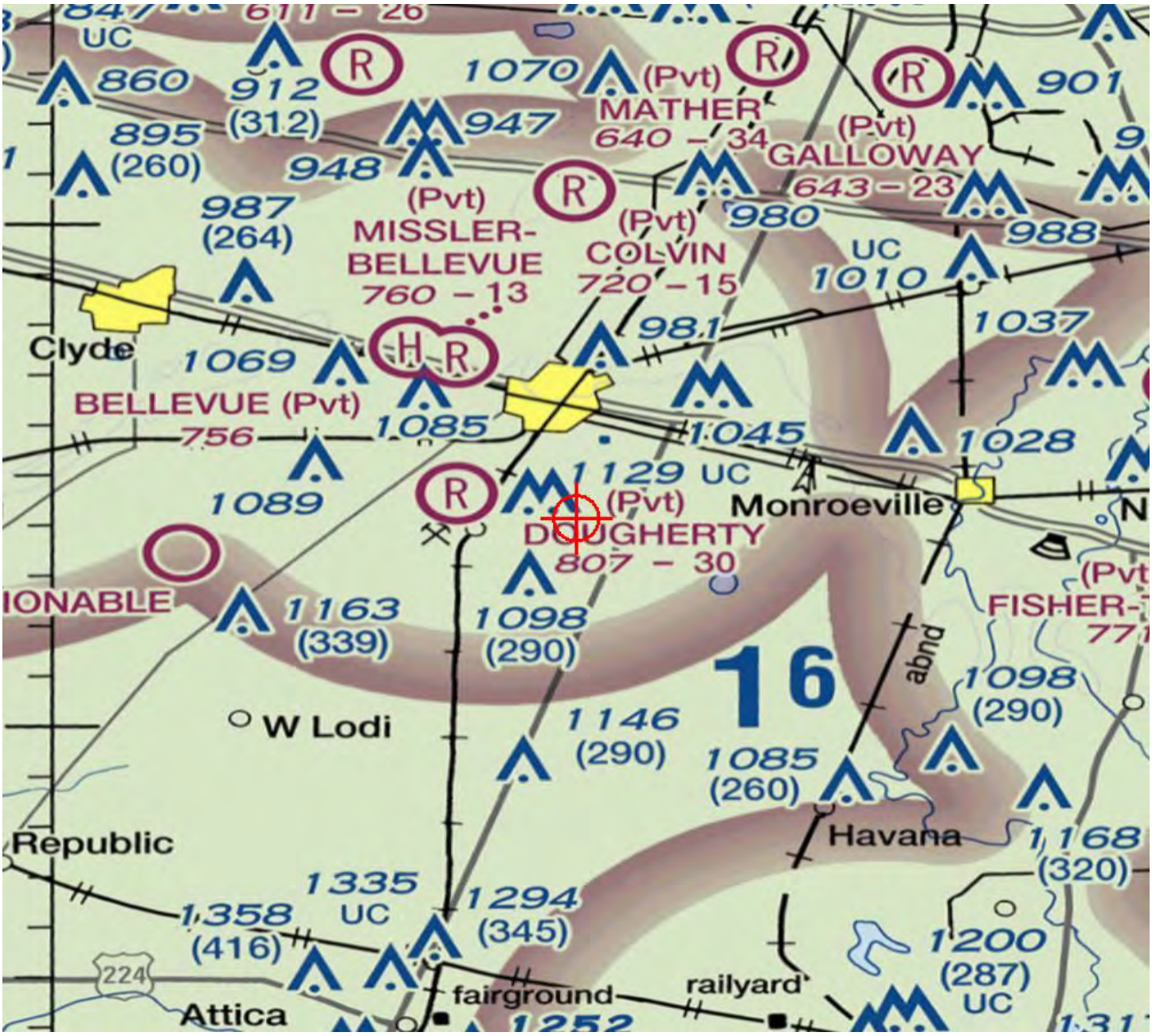
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11936-OE

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720 – 15
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Havana
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(345)
1200
(287)
UC
224
fairground
railyard
Attica

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11937-OE

Issued Date: 02/12/2020

Nate Pedder
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Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T38
Location:	Bellevue, OH
Latitude:	41-14-05.43N NAD 83
Longitude:	82-50-02.03W
Heights:	802 feet site elevation (SE)
	659 feet above ground level (AGL)
	1461 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11937-OE.

Signature Control No: 392869089-430570580 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

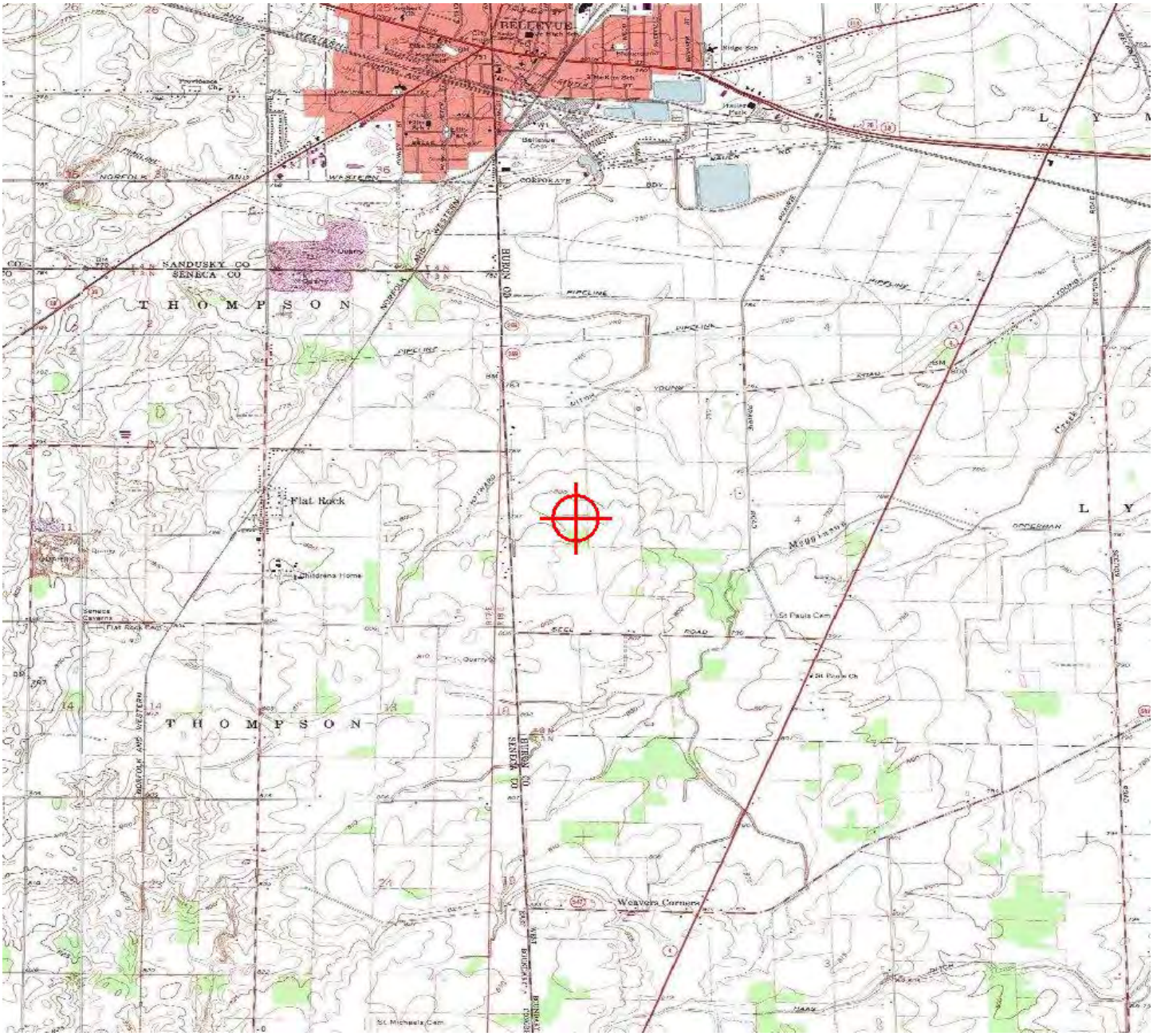
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11937-OE



UC
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MATHER
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(260)
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GALLOWAY
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MISSLER-
BELLEVUE
760 – 13
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fairground
railyard
Attica

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11938-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T39
Location:	Bellevue, OH
Latitude:	41-13-44.73N NAD 83
Longitude:	82-48-17.47W
Heights:	788 feet site elevation (SE)
	659 feet above ground level (AGL)
	1447 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11938-OE.

Signature Control No: 392869090-430570583 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

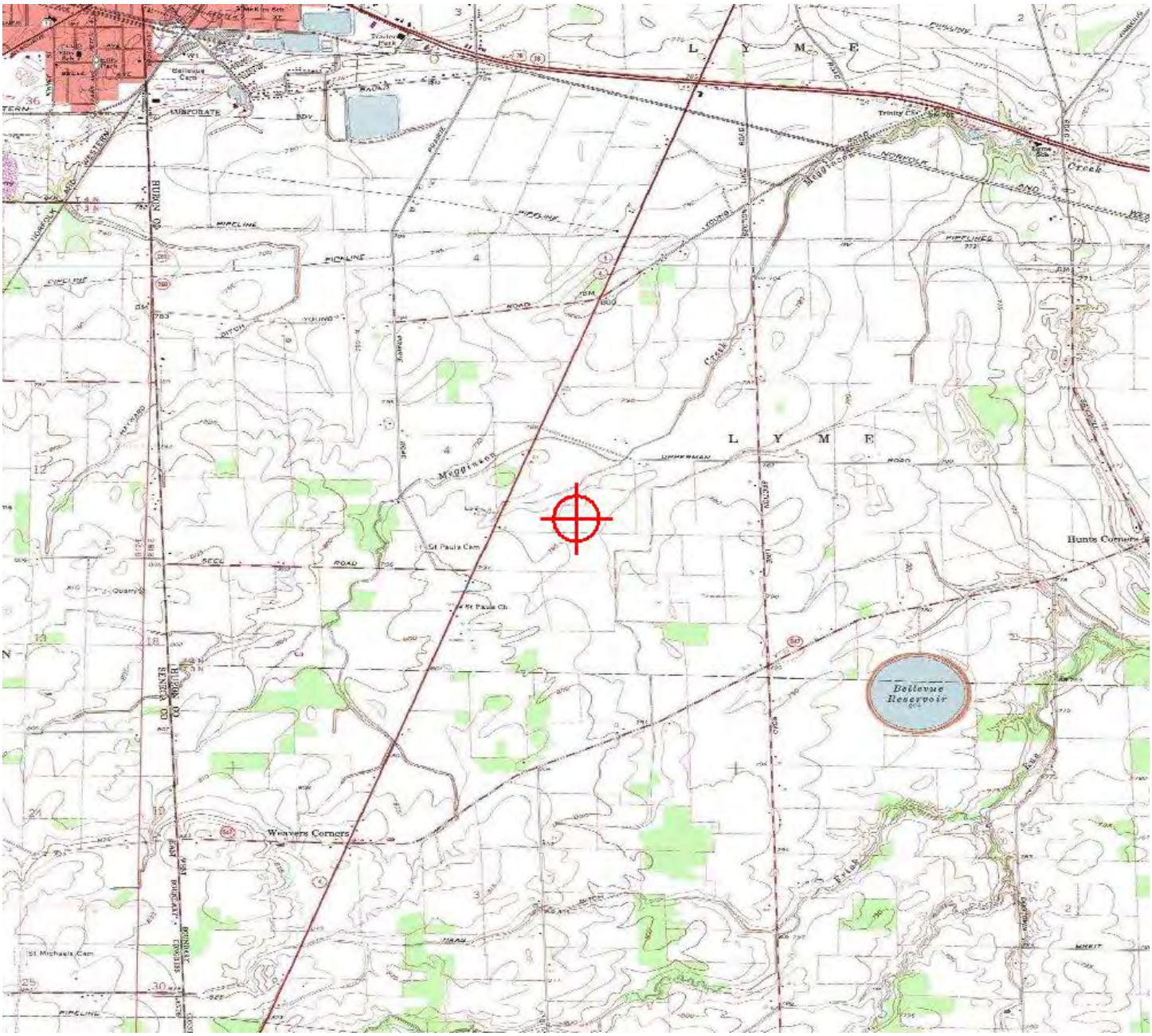
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

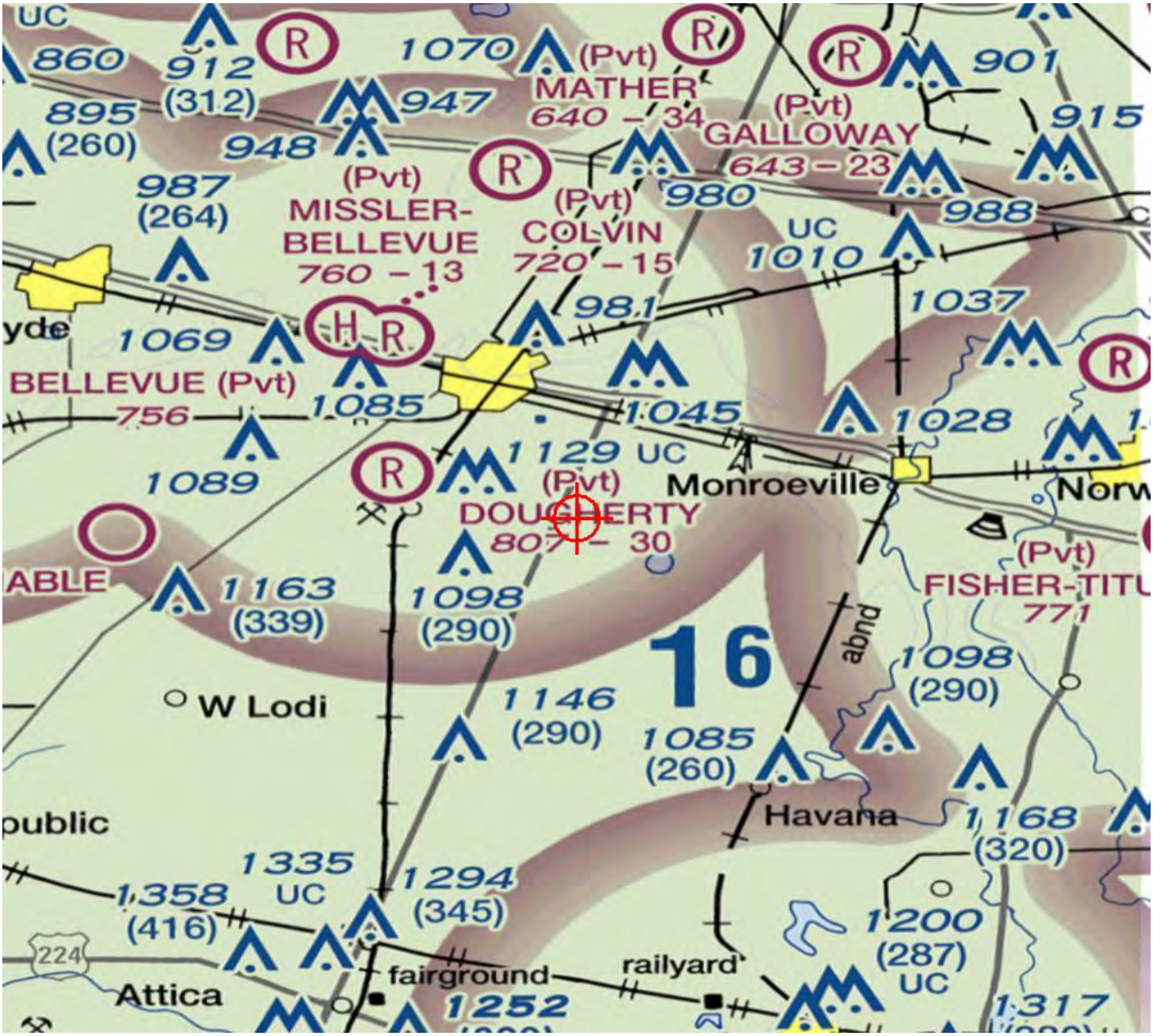
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11938-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11941-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T41
Location:	Bellevue, OH
Latitude:	41-12-13.95N NAD 83
Longitude:	82-46-53.36W
Heights:	784 feet site elevation (SE)
	659 feet above ground level (AGL)
	1443 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11941-OE.

Signature Control No: 392869093-430570591 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
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2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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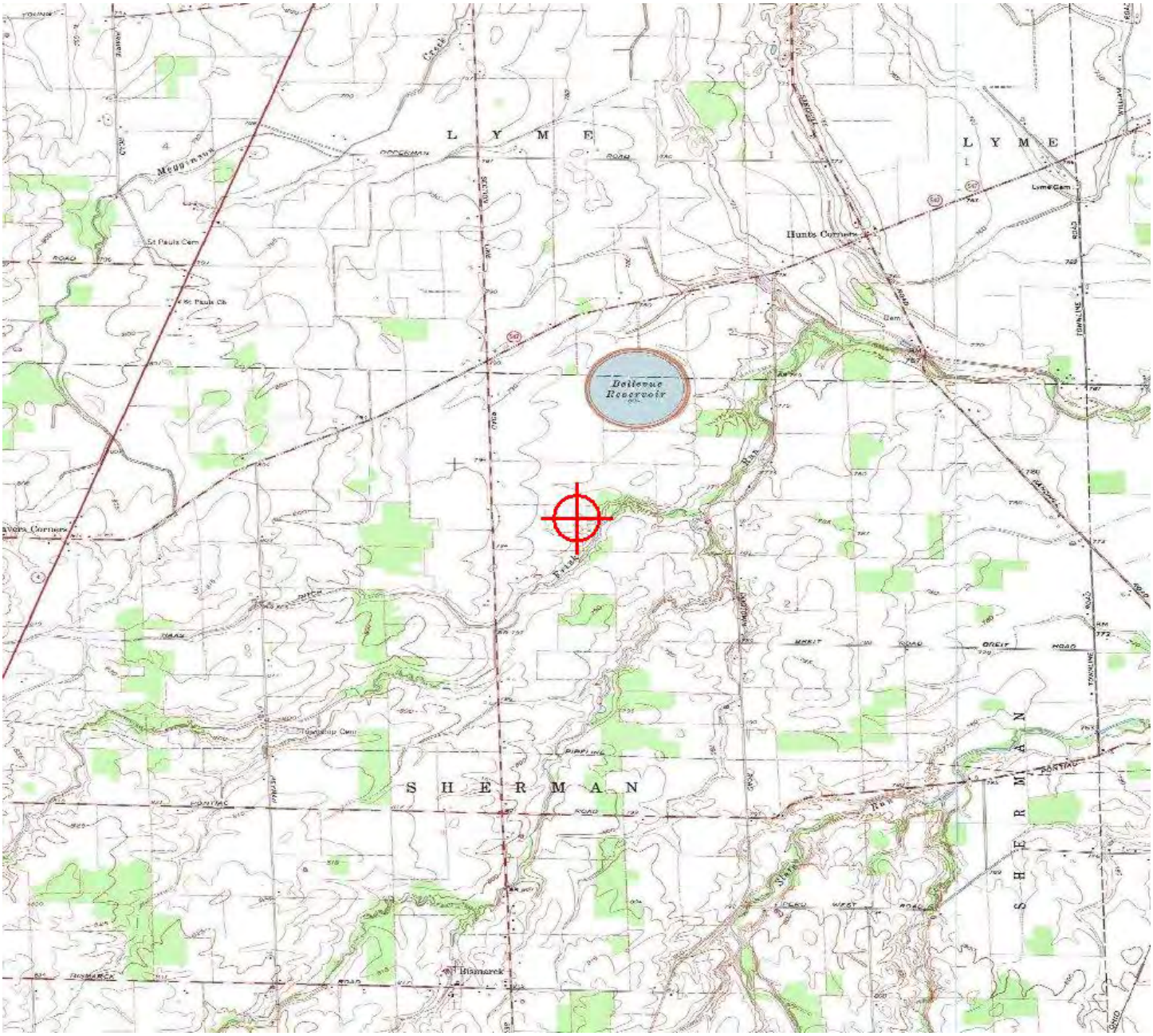
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

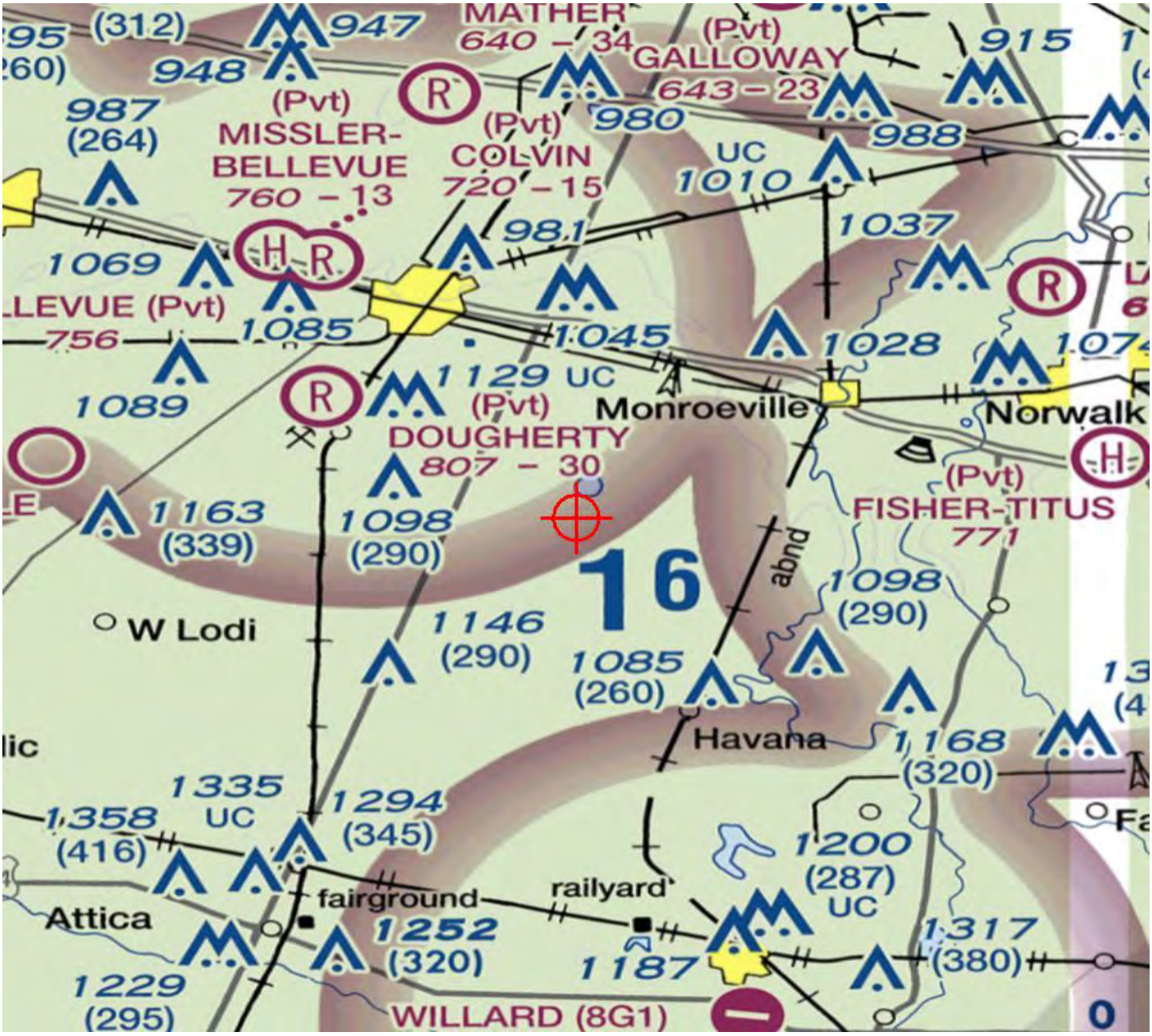
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11941-OE

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1200
(287)
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(380)
1229
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WILLARD (8G1)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11942-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T42
Location:	Bellevue, OH
Latitude:	41-12-01.31N NAD 83
Longitude:	82-46-38.15W
Heights:	782 feet site elevation (SE)
	659 feet above ground level (AGL)
	1441 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11942-OE.

Signature Control No: 392869094-430570594 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

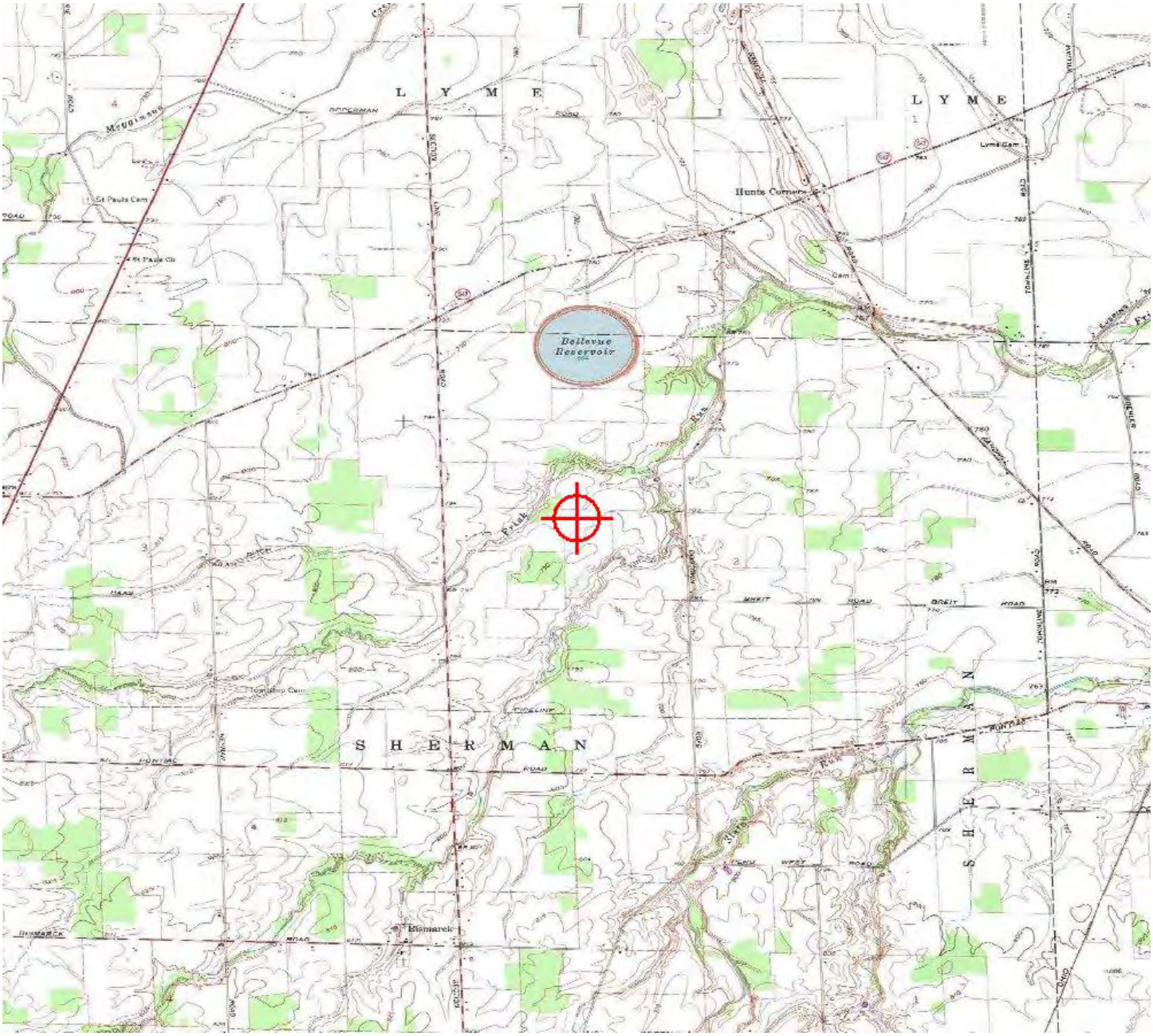
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

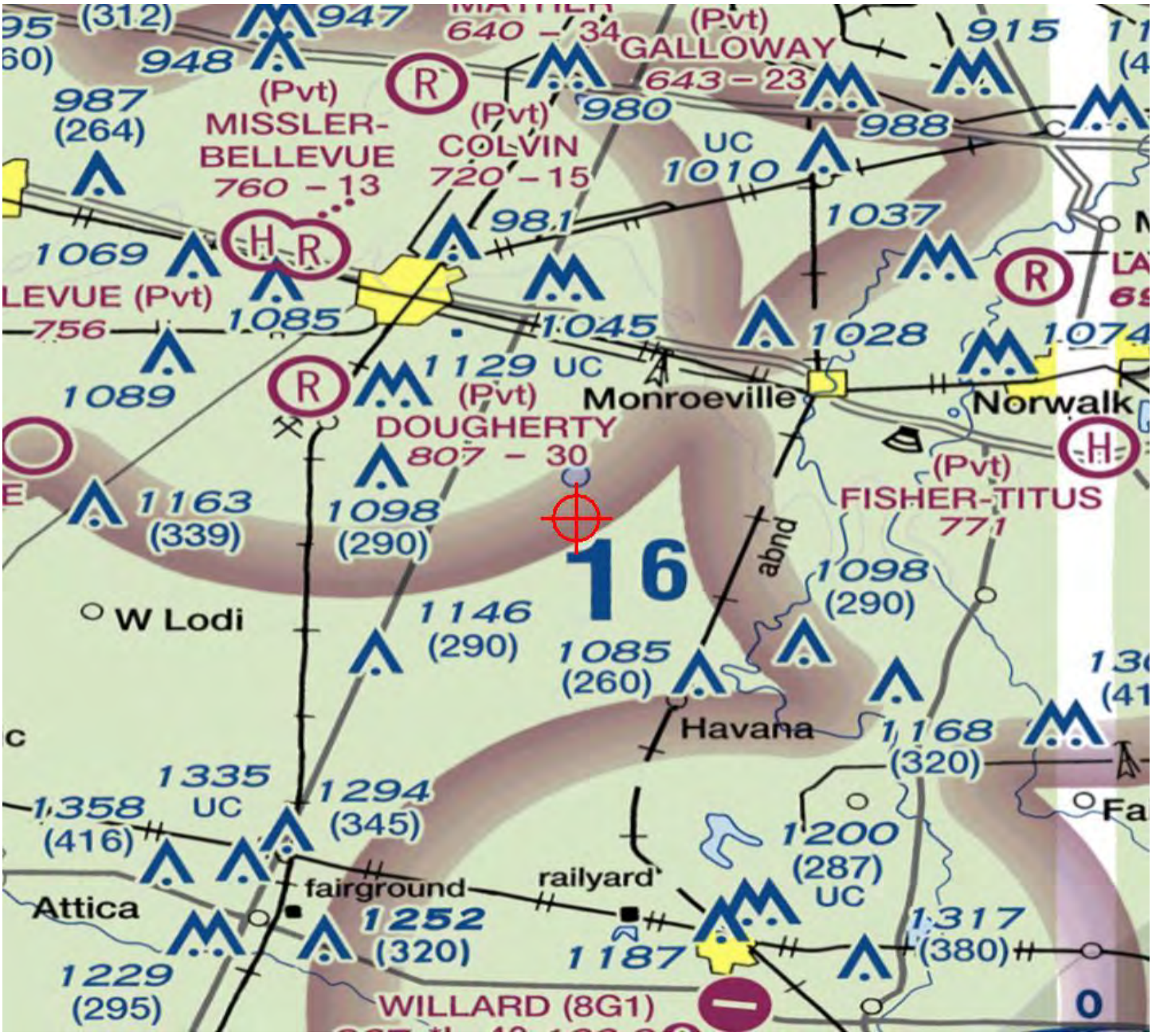
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11942-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11943-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T43
Location:	Bellevue, OH
Latitude:	41-11-53.20N NAD 83
Longitude:	82-49-51.92W
Heights:	828 feet site elevation (SE)
	659 feet above ground level (AGL)
	1487 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11943-OE.

Signature Control No: 392869095-430570595 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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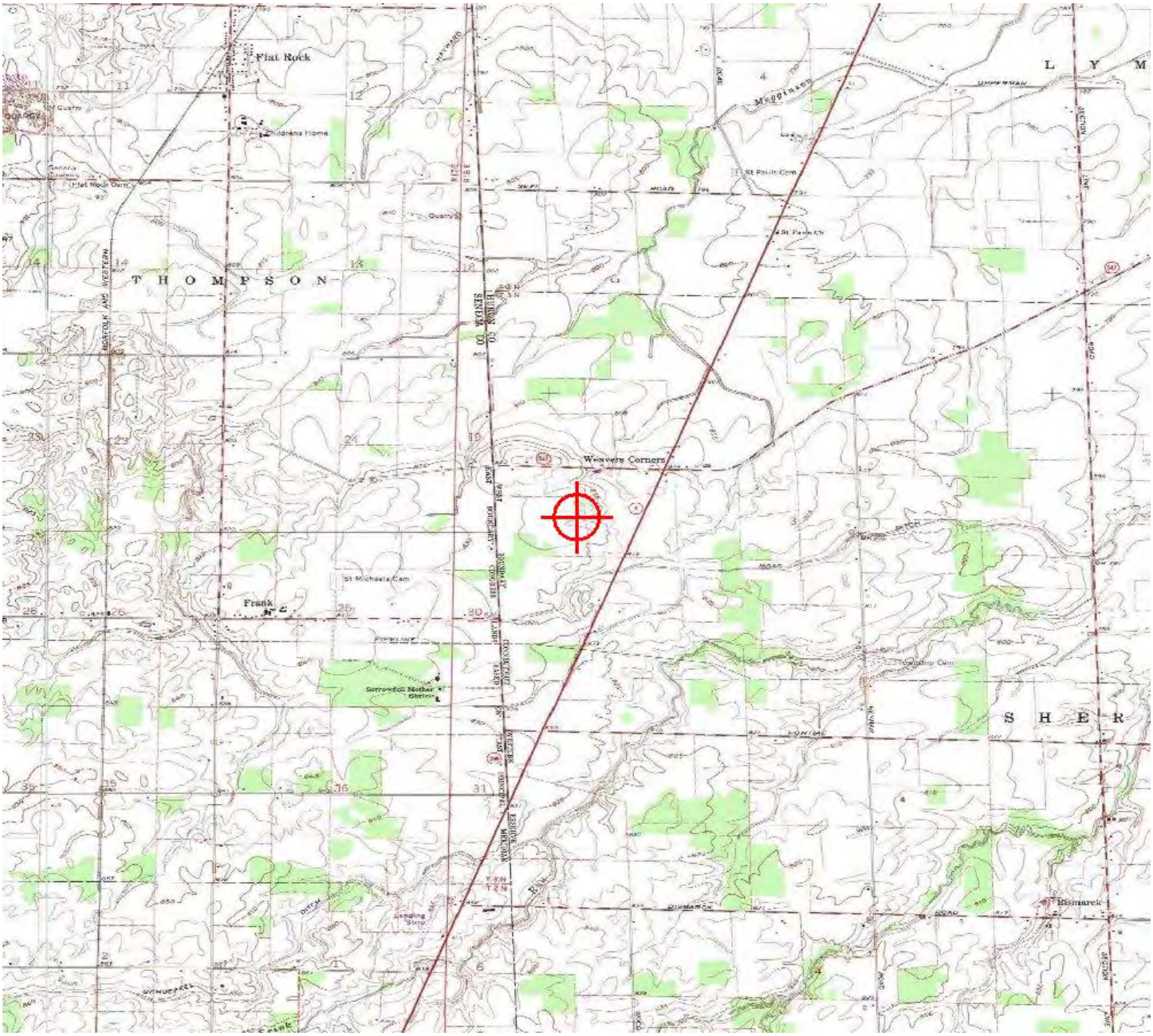
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

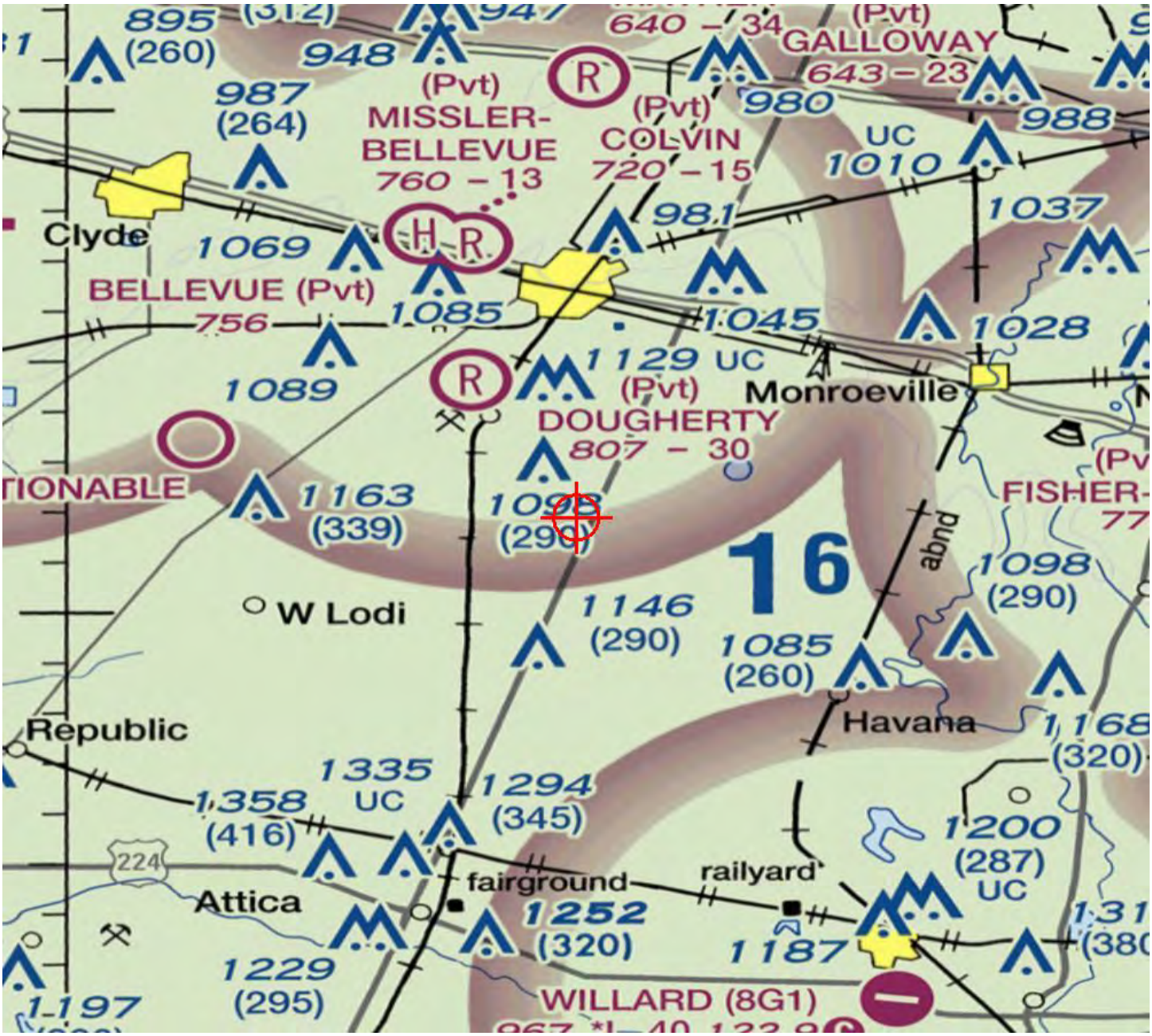
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11943-OE

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fairground
railyard
Attica
1252
(320)
1187
1229
(295)
1197
WILLARD (8G1)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11944-OE

Issued Date: 02/12/2020

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Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T44
Location:	Bellevue, OH
Latitude:	41-11-33.33N NAD 83
Longitude:	82-46-28.97W
Heights:	790 feet site elevation (SE)
	659 feet above ground level (AGL)
	1449 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11944-OE.

Signature Control No: 392869096-430570597 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

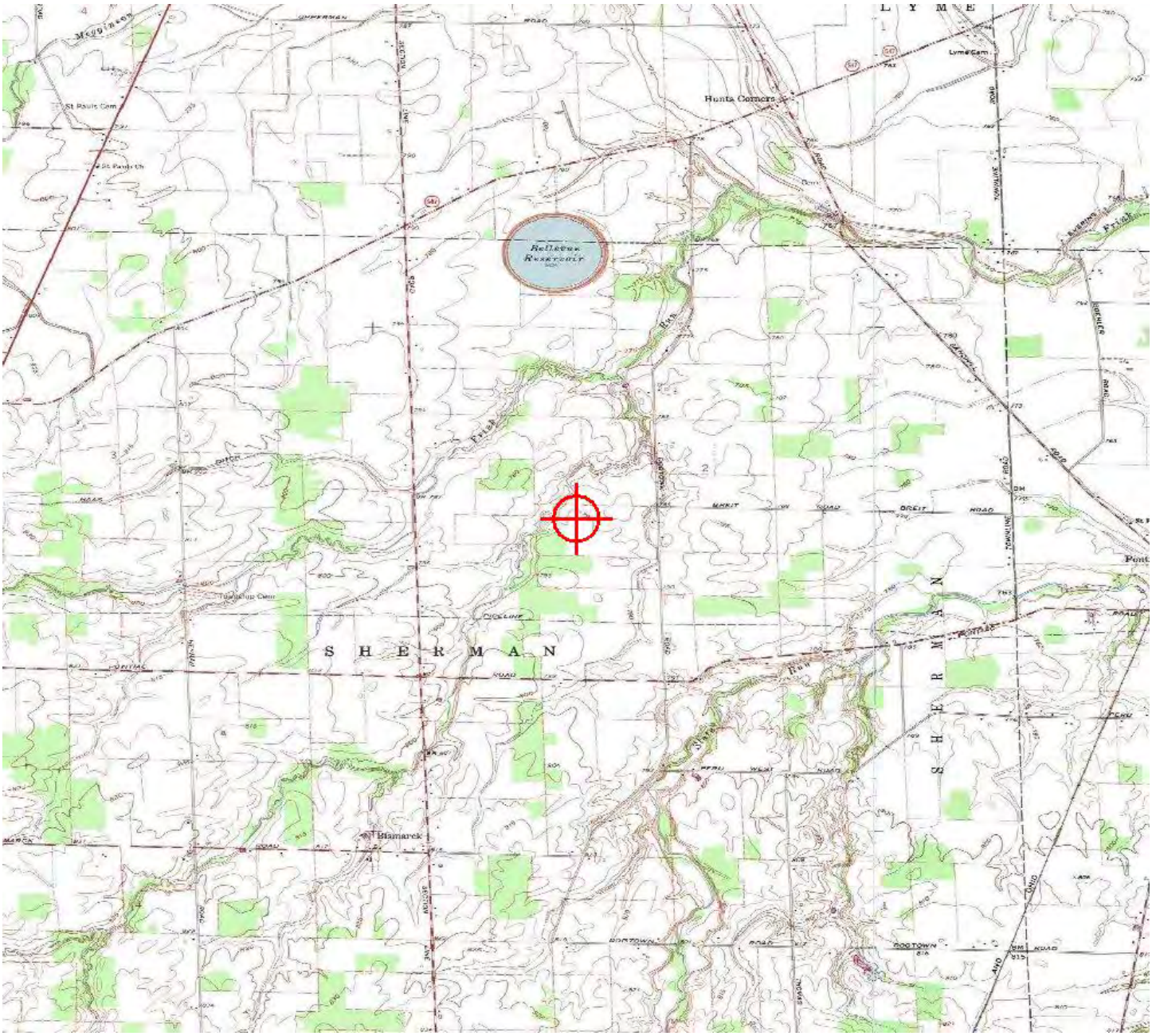
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

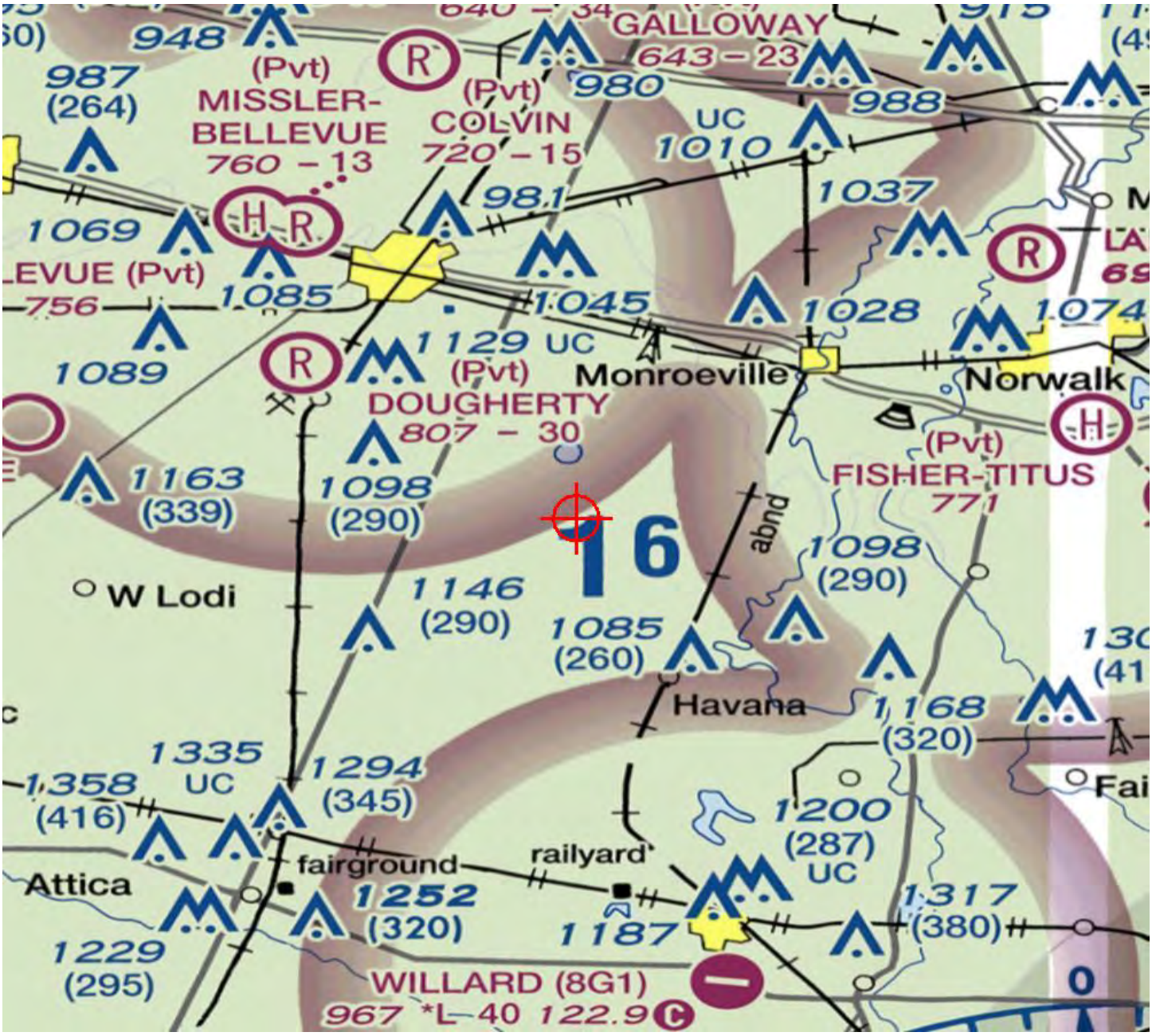
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11944-OE

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WILLARD (8G1)
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11945-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T45
Location:	Bellevue, OH
Latitude:	41-11-15.83N NAD 83
Longitude:	82-46-30.13W
Heights:	792 feet site elevation (SE)
	659 feet above ground level (AGL)
	1451 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11945-OE.

Signature Control No: 392869097-430570600 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

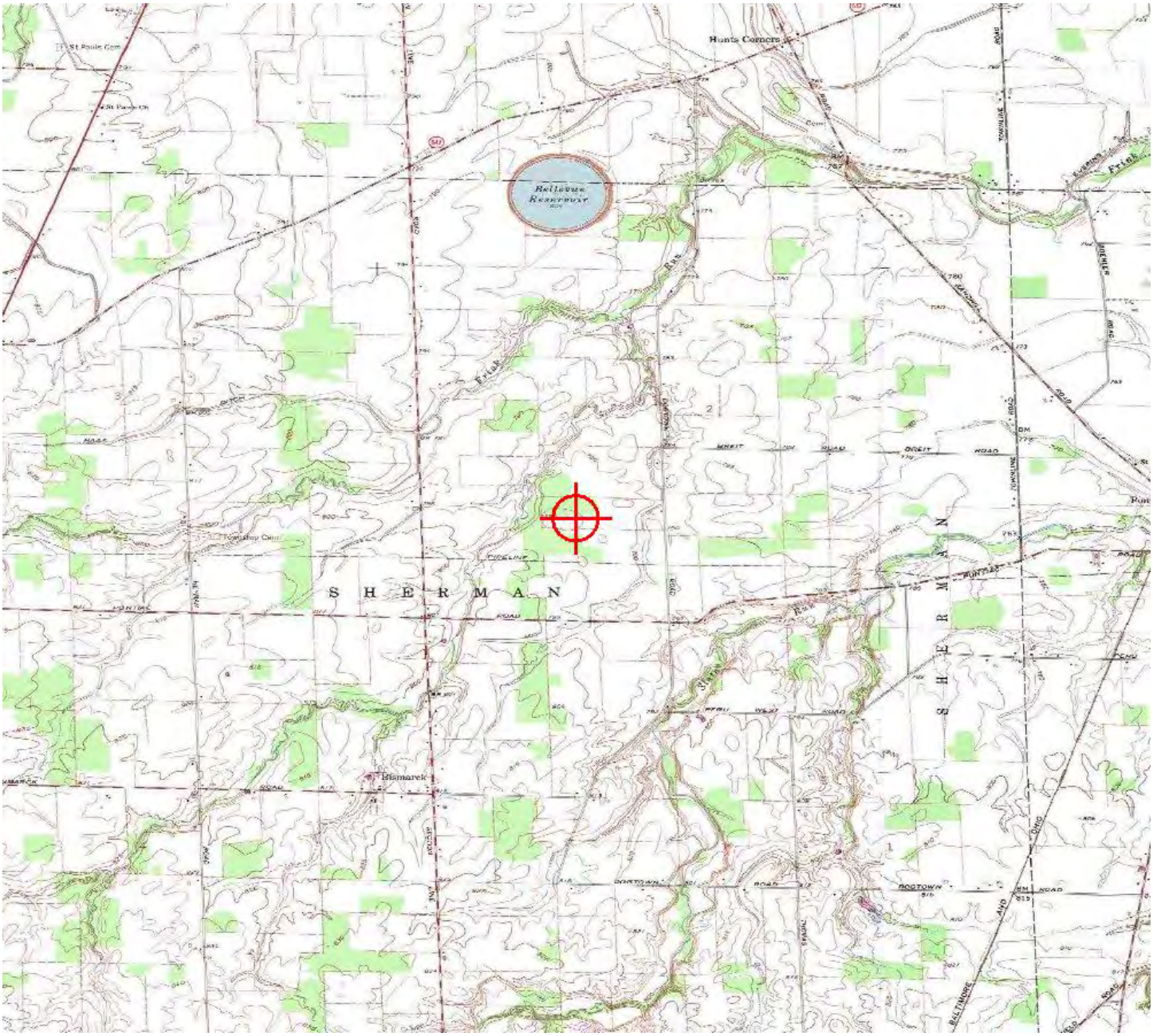
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

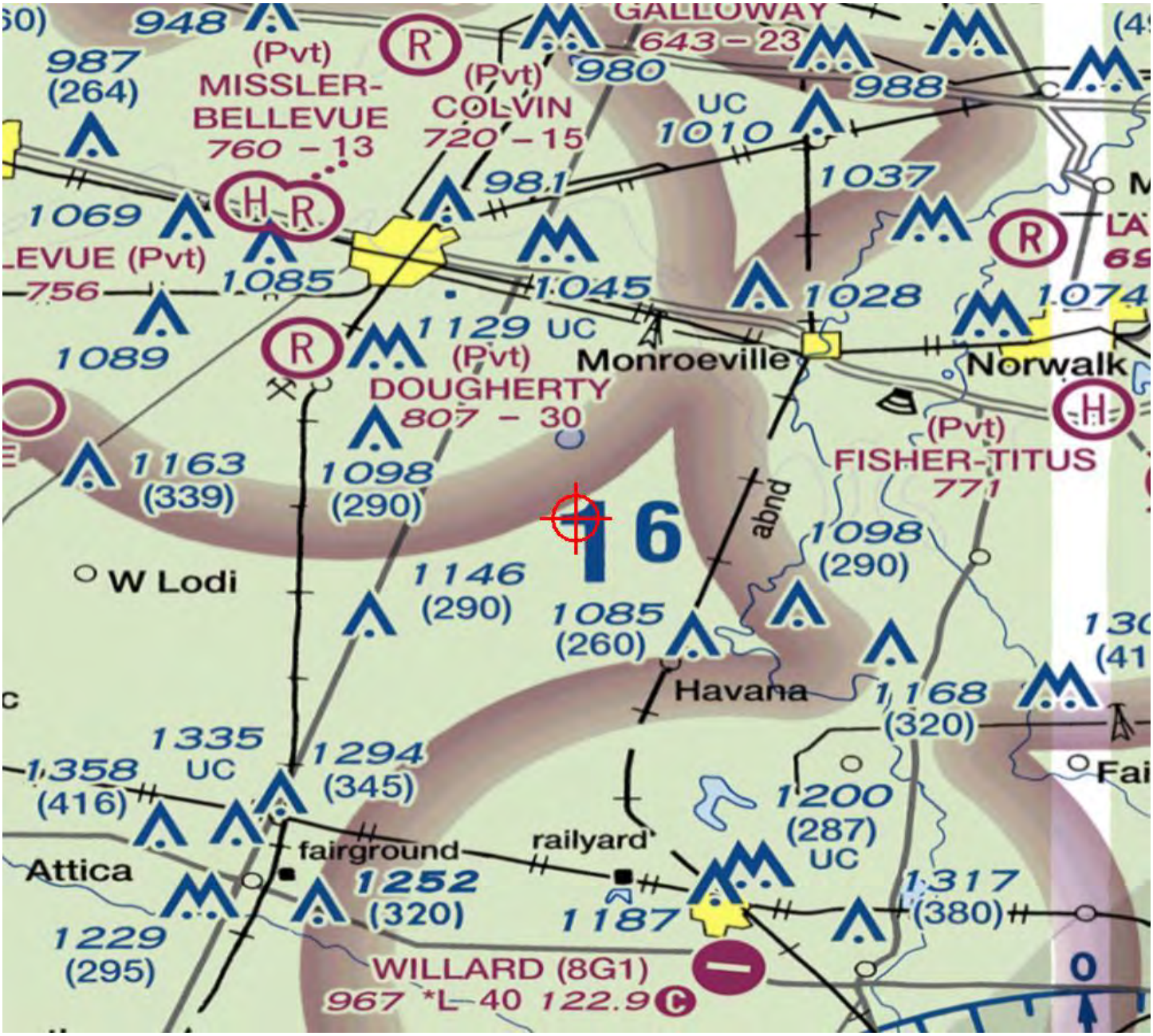
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11945-OE

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DOUGHERTY
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Monroeville
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11946-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T46
Location:	Bellevue, OH
Latitude:	41-10-54.73N NAD 83
Longitude:	82-46-54.79W
Heights:	796 feet site elevation (SE)
	659 feet above ground level (AGL)
	1455 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11946-OE.

Signature Control No: 392869098-430570610 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
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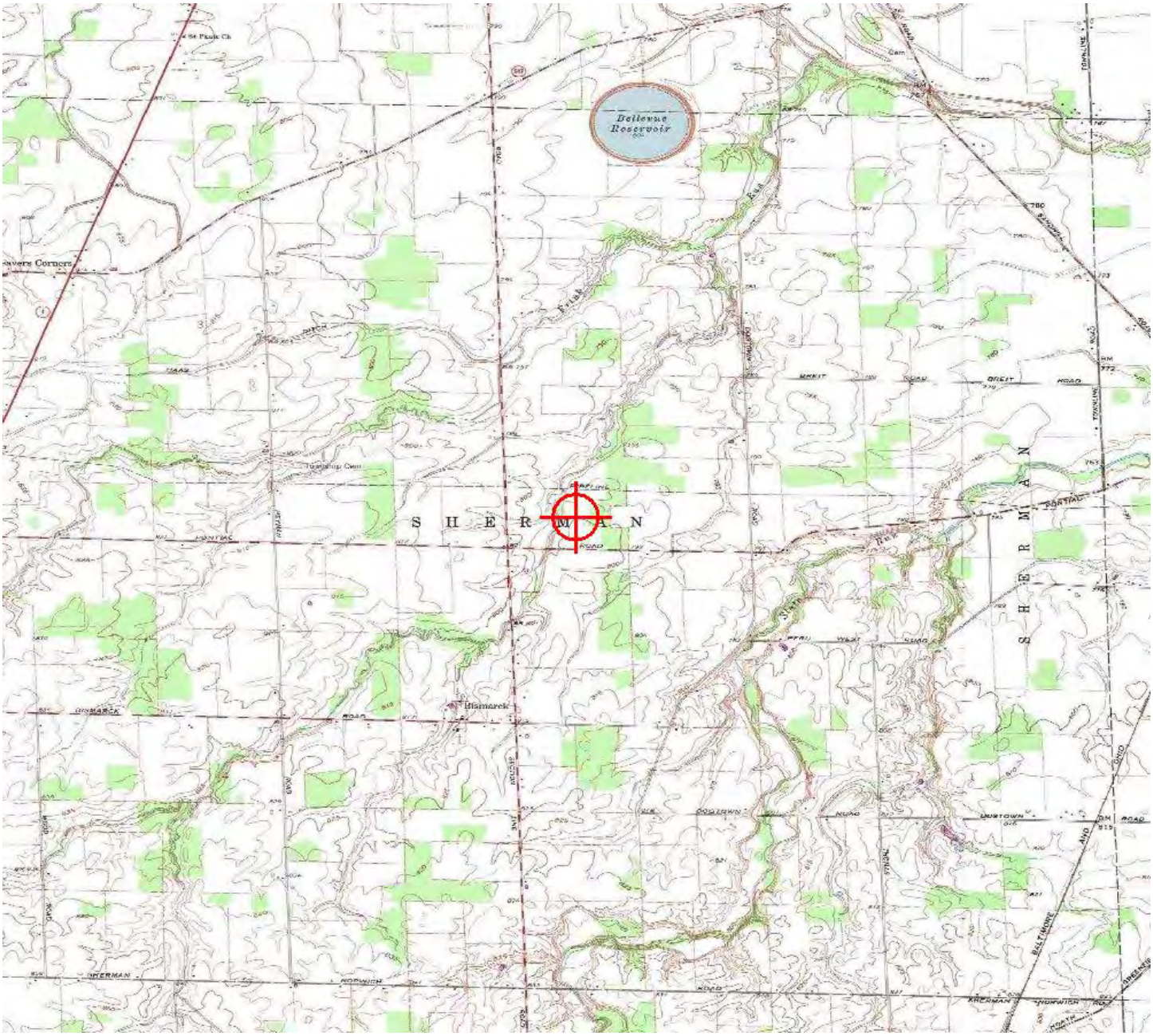
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

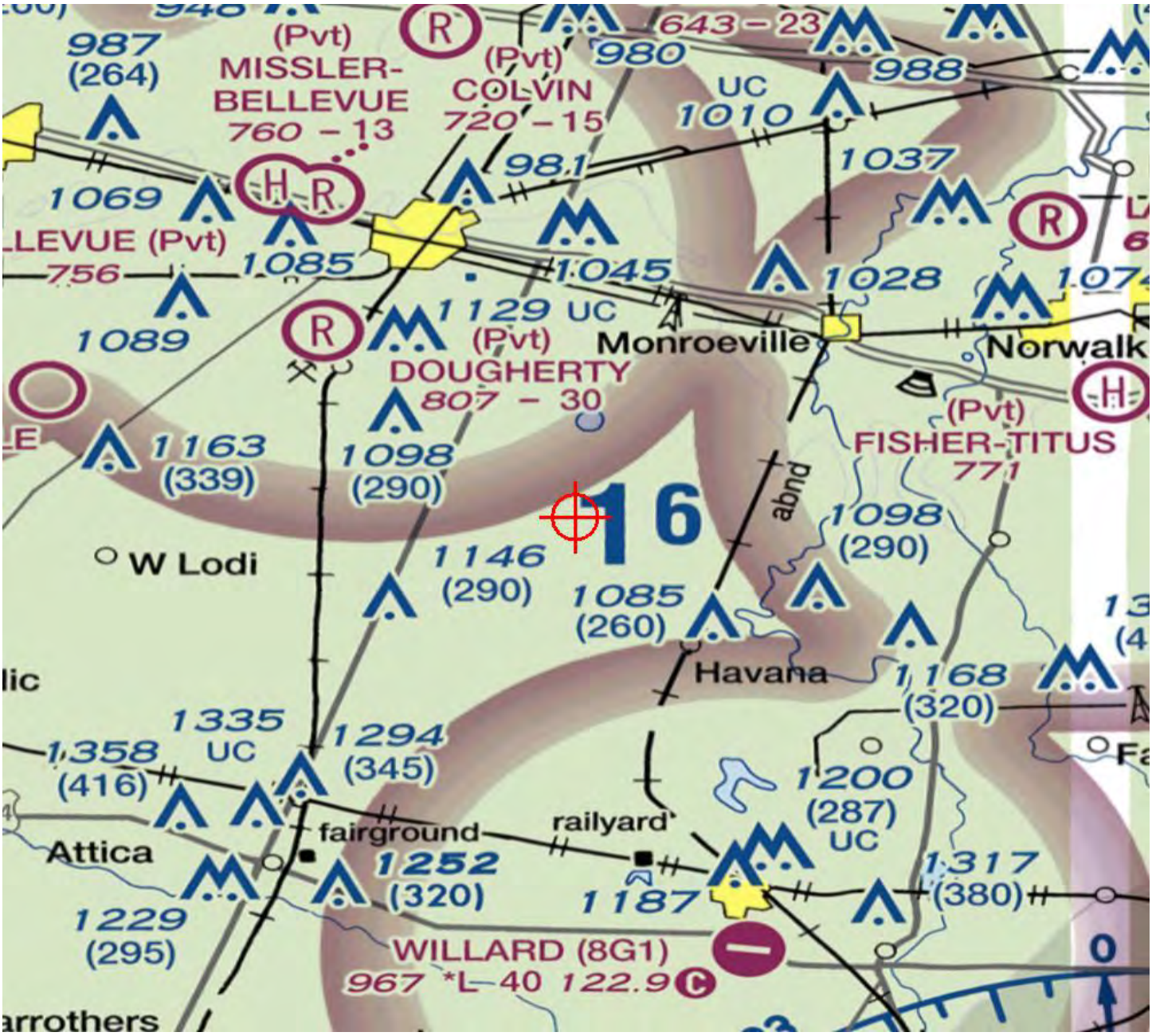
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11946-OE

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DOUGHERTY
807 – 30
Monroeville
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11947-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T47
Location:	Bellevue, OH
Latitude:	41-10-35.69N NAD 83
Longitude:	82-49-46.04W
Heights:	820 feet site elevation (SE)
	659 feet above ground level (AGL)
	1479 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11947-OE.

Signature Control No: 392869099-430570615 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

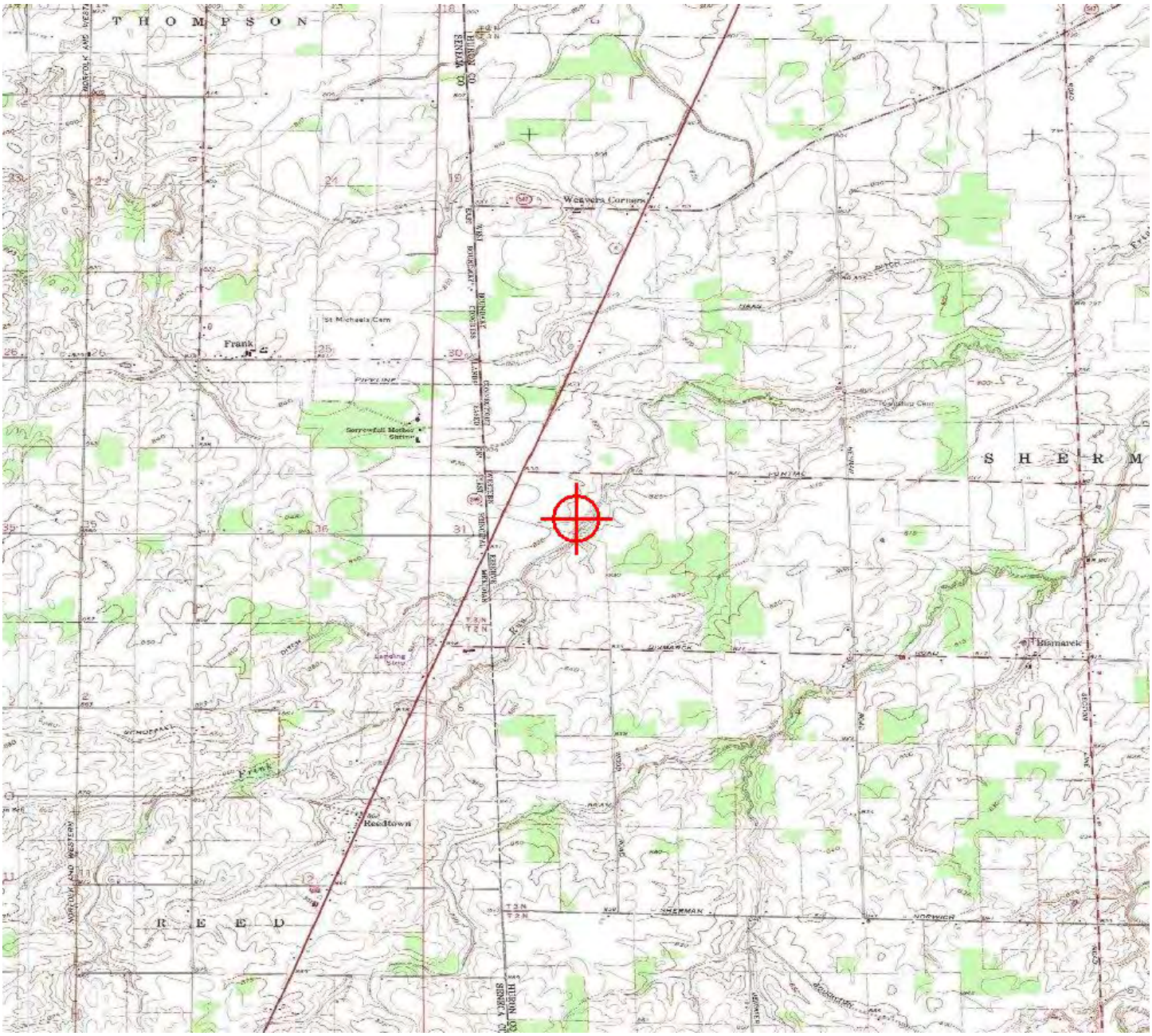
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11947-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11948-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T48
Location:	Bellevue, OH
Latitude:	41-09-17.21N NAD 83
Longitude:	82-48-41.34W
Heights:	836 feet site elevation (SE)
	659 feet above ground level (AGL)
	1495 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11948-OE.

Signature Control No: 392869101-430570650 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

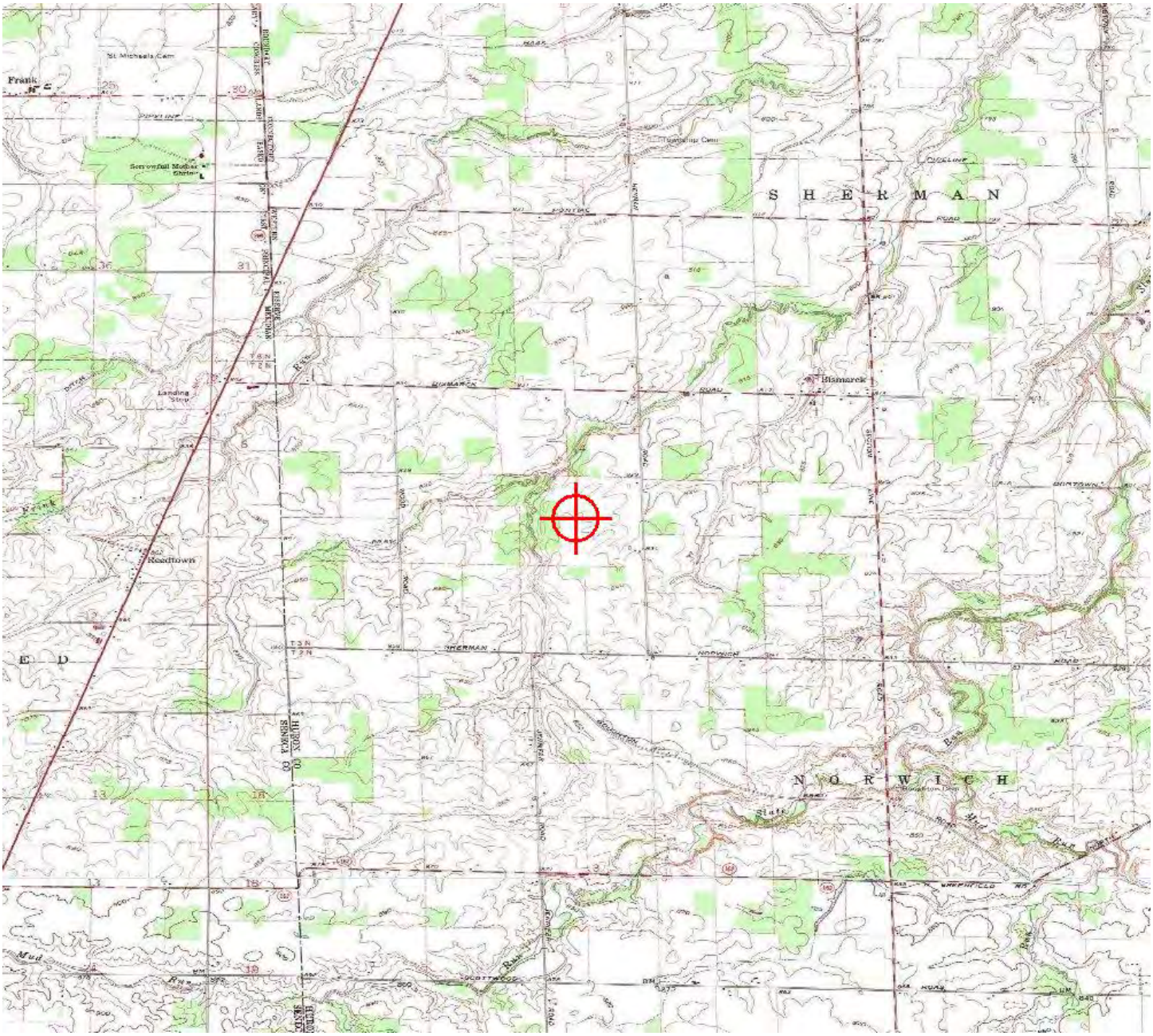
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

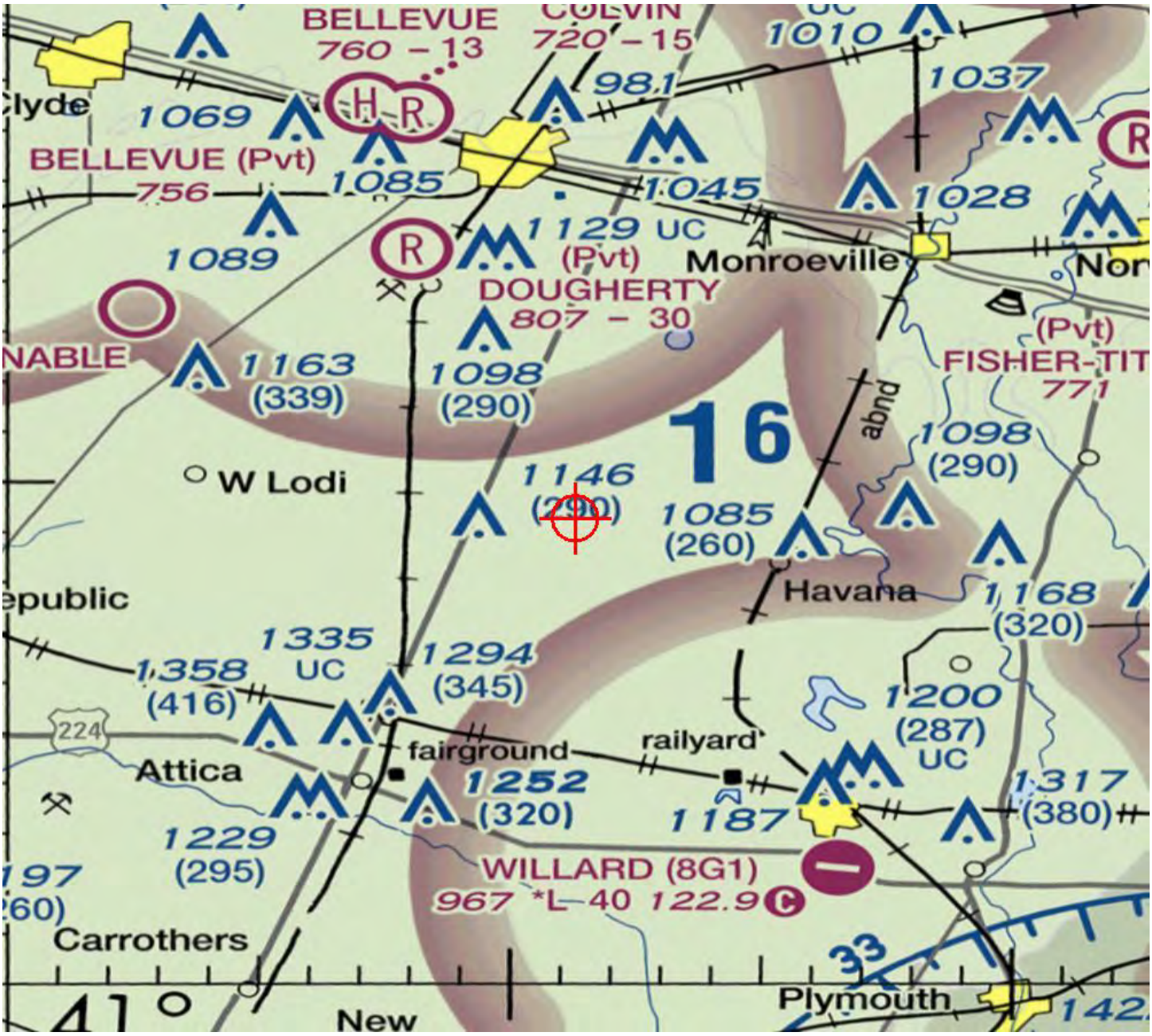
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11948-OE




BELLEVUE
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COLVIN
720 – 15
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98.1
1069
BELLEVUE (Pvt)
756
1085
1045
1028
1089
1129 UC
(Pvt)
Monroeville
DOUGHERTY
807 – 30
(Pvt)
FISHER-TIT
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Havana
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(320)
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(416)
1294
(345)
1200
(287)
UC
224
fairground
railyard
Attica
1252
(320)
1187
1317
(380)
1229
(295)
WILLARD (8G1)
967 *L–40 122.9
Carrothers
33
Plymouth
New

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11949-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T49
Location:	Bellevue, OH
Latitude:	41-09-06.18N NAD 83
Longitude:	82-46-53.24W
Heights:	828 feet site elevation (SE)
	659 feet above ground level (AGL)
	1487 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11949-OE.

Signature Control No: 392869102-430570654 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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2018-WTE-11967-OE
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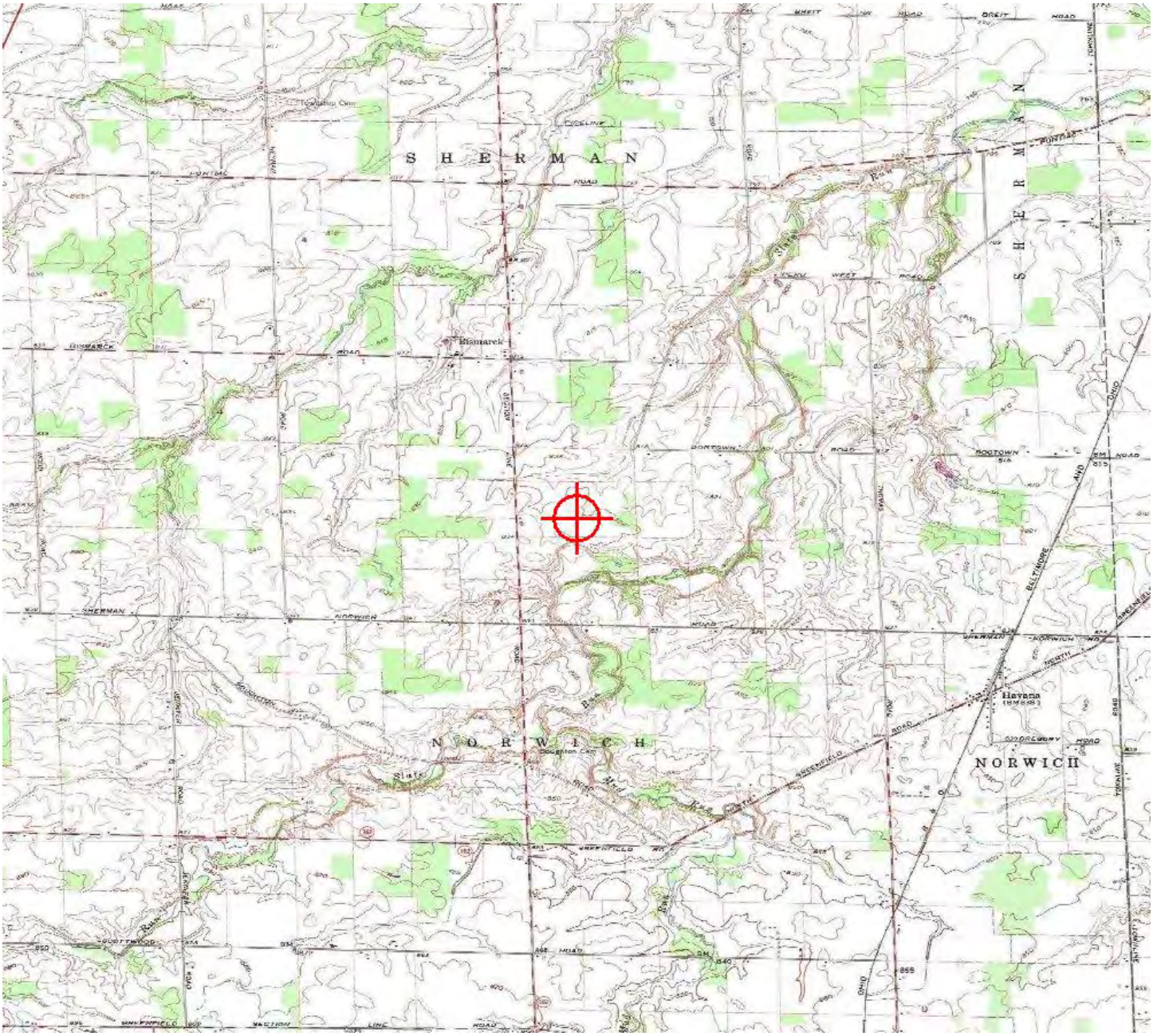
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

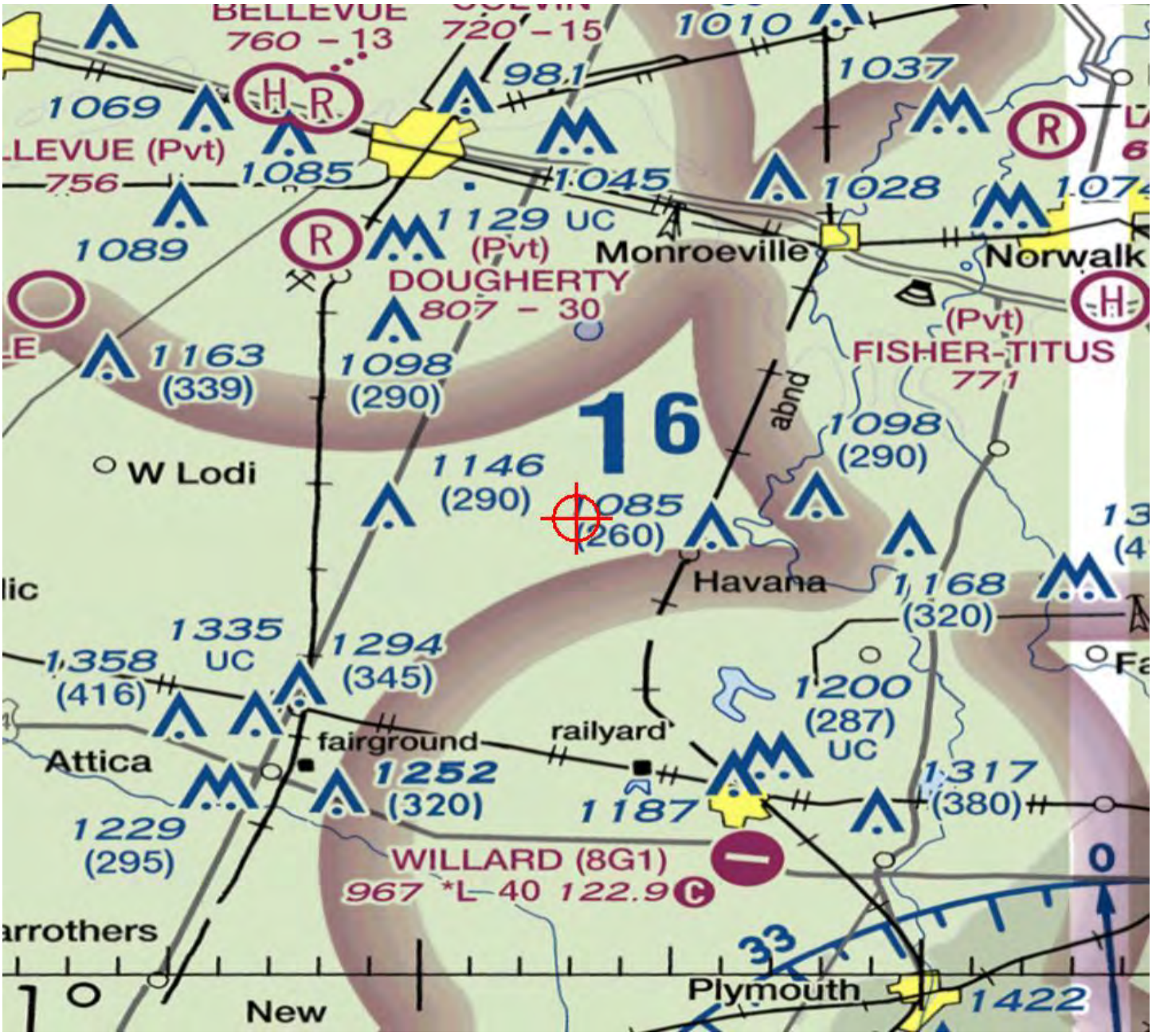
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11949-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11951-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T50
Location:	Bellevue, OH
Latitude:	41-09-00.95N NAD 83
Longitude:	82-49-20.03W
Heights:	844 feet site elevation (SE)
	659 feet above ground level (AGL)
	1503 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11951-OE.

Signature Control No: 392869104-430561927 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

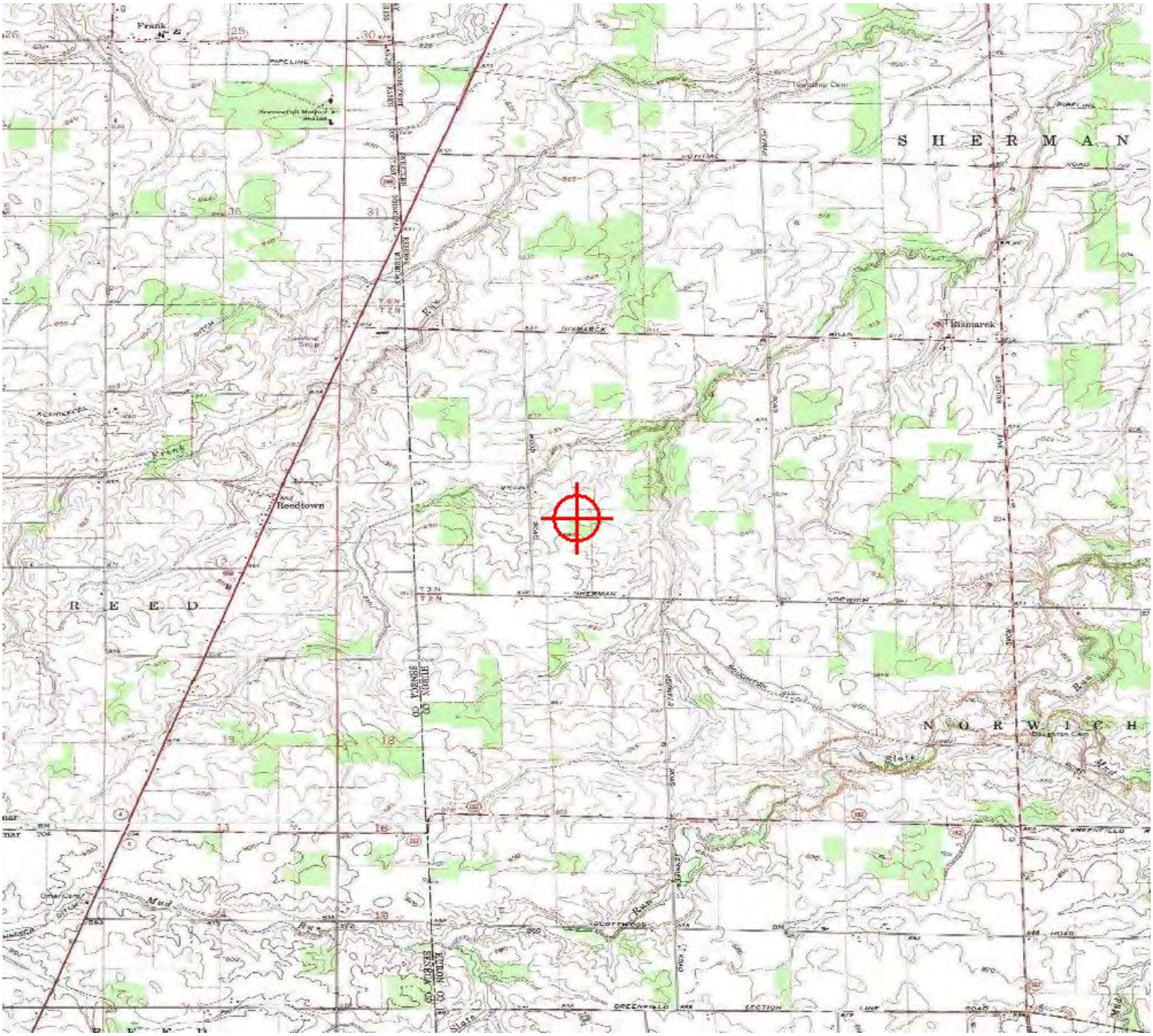
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

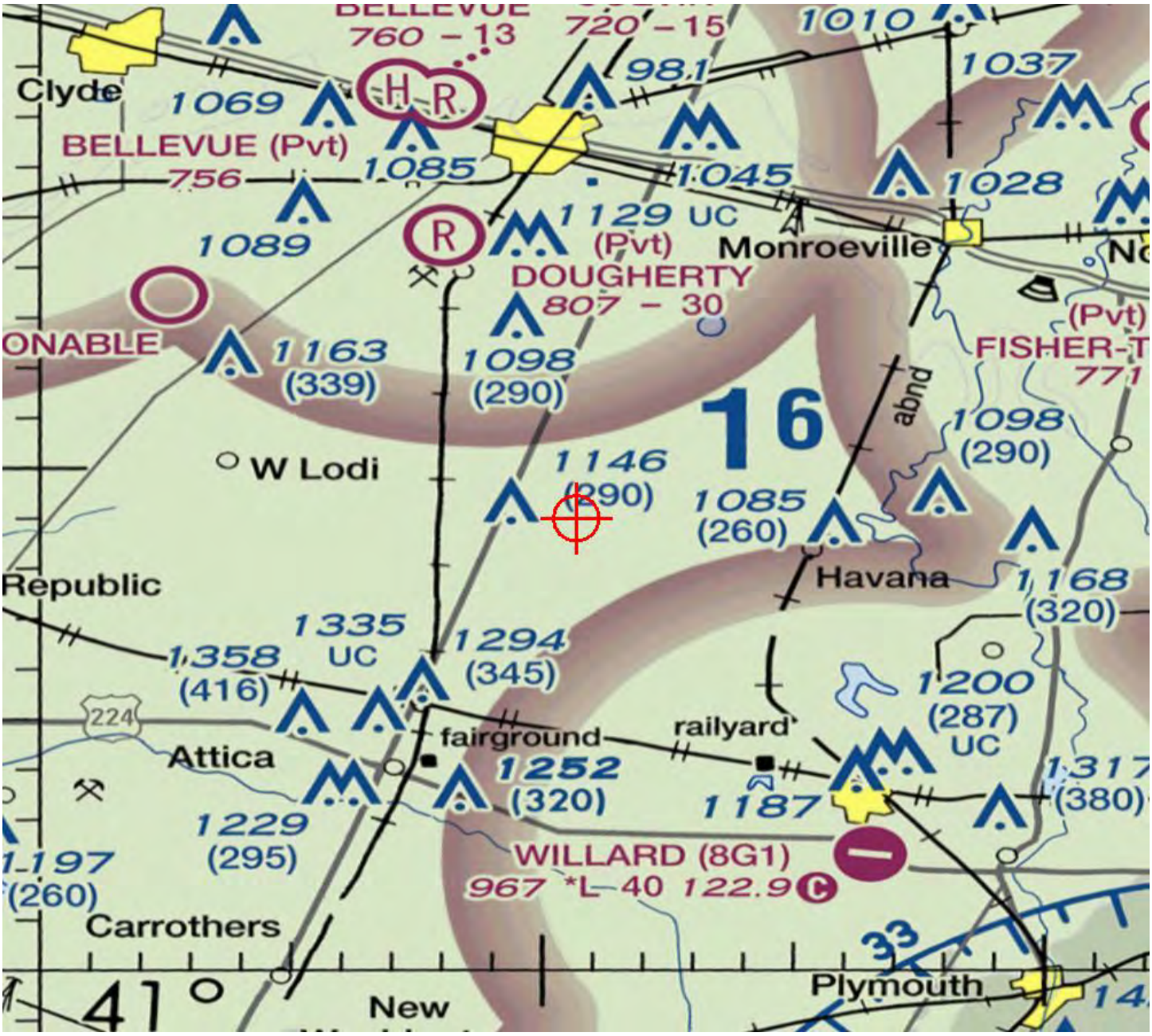
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11951-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11952-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T51
Location:	Bellevue, OH
Latitude:	41-08-54.22N NAD 83
Longitude:	82-48-42.36W
Heights:	842 feet site elevation (SE)
	659 feet above ground level (AGL)
	1501 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11952-OE.

Signature Control No: 392869105-430561929 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
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2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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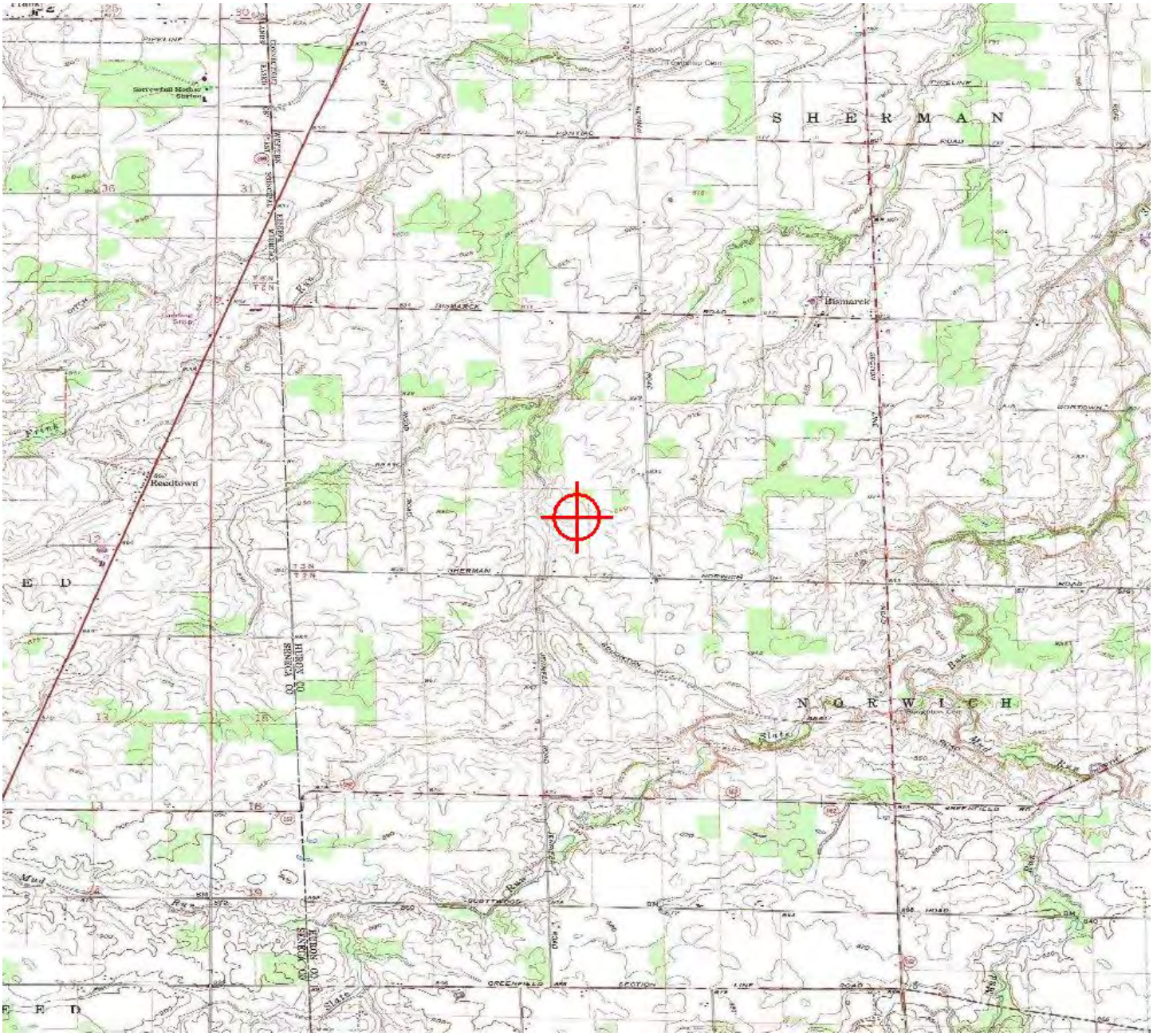
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

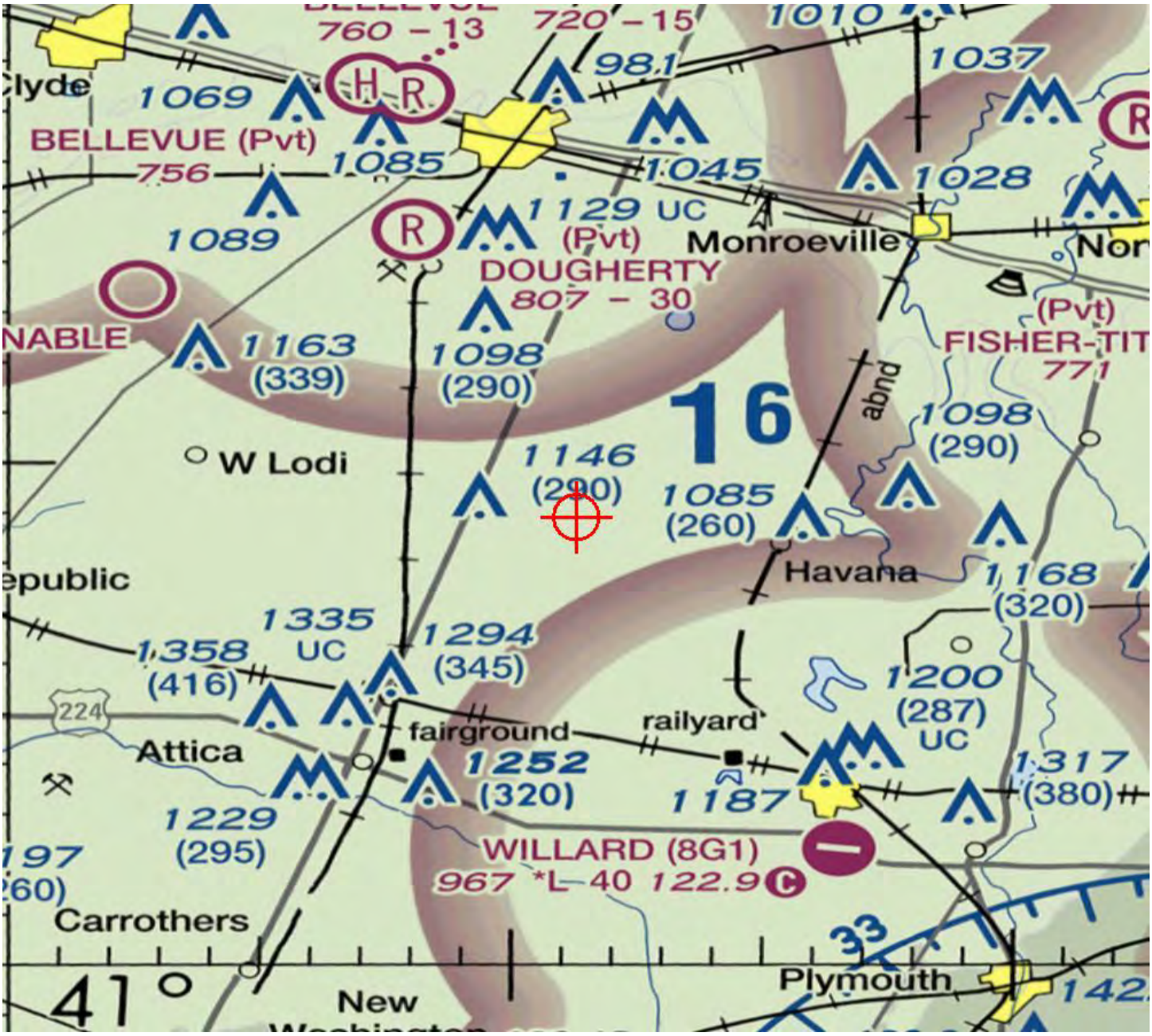
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11952-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11953-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T52
Location:	Bellevue, OH
Latitude:	41-08-31.18N NAD 83
Longitude:	82-49-57.60W
Heights:	862 feet site elevation (SE)
	659 feet above ground level (AGL)
	1521 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11953-OE.

Signature Control No: 392869106-430561923 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

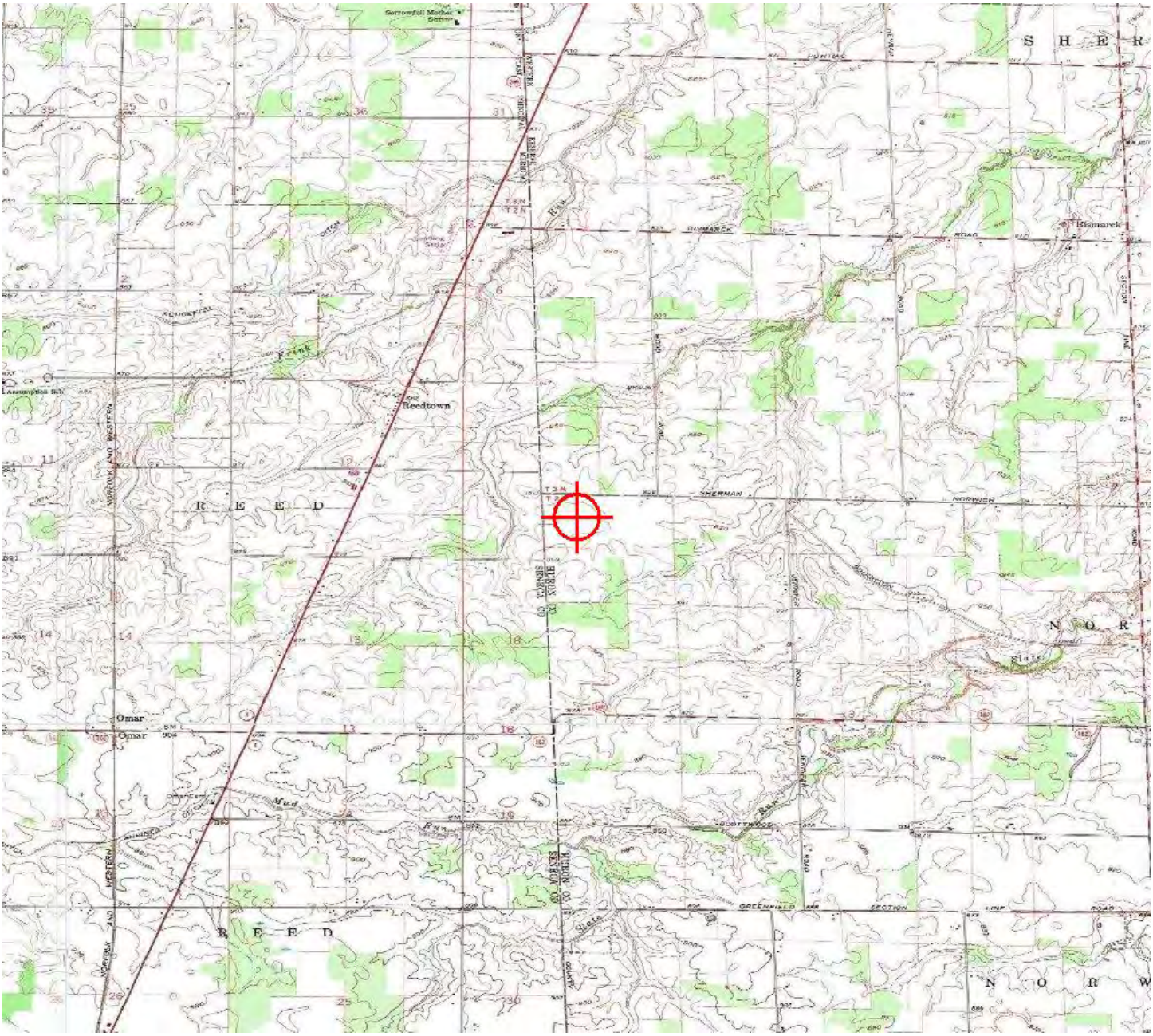
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11953-OE



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Obstruction Evaluation Group
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Aeronautical Study No.
2018-WTE-11954-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T53
Location:	Bellevue, OH
Latitude:	41-08-19.44N NAD 83
Longitude:	82-49-57.20W
Heights:	864 feet site elevation (SE)
	659 feet above ground level (AGL)
	1523 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11954-OE.

Signature Control No: 392869107-430561924 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

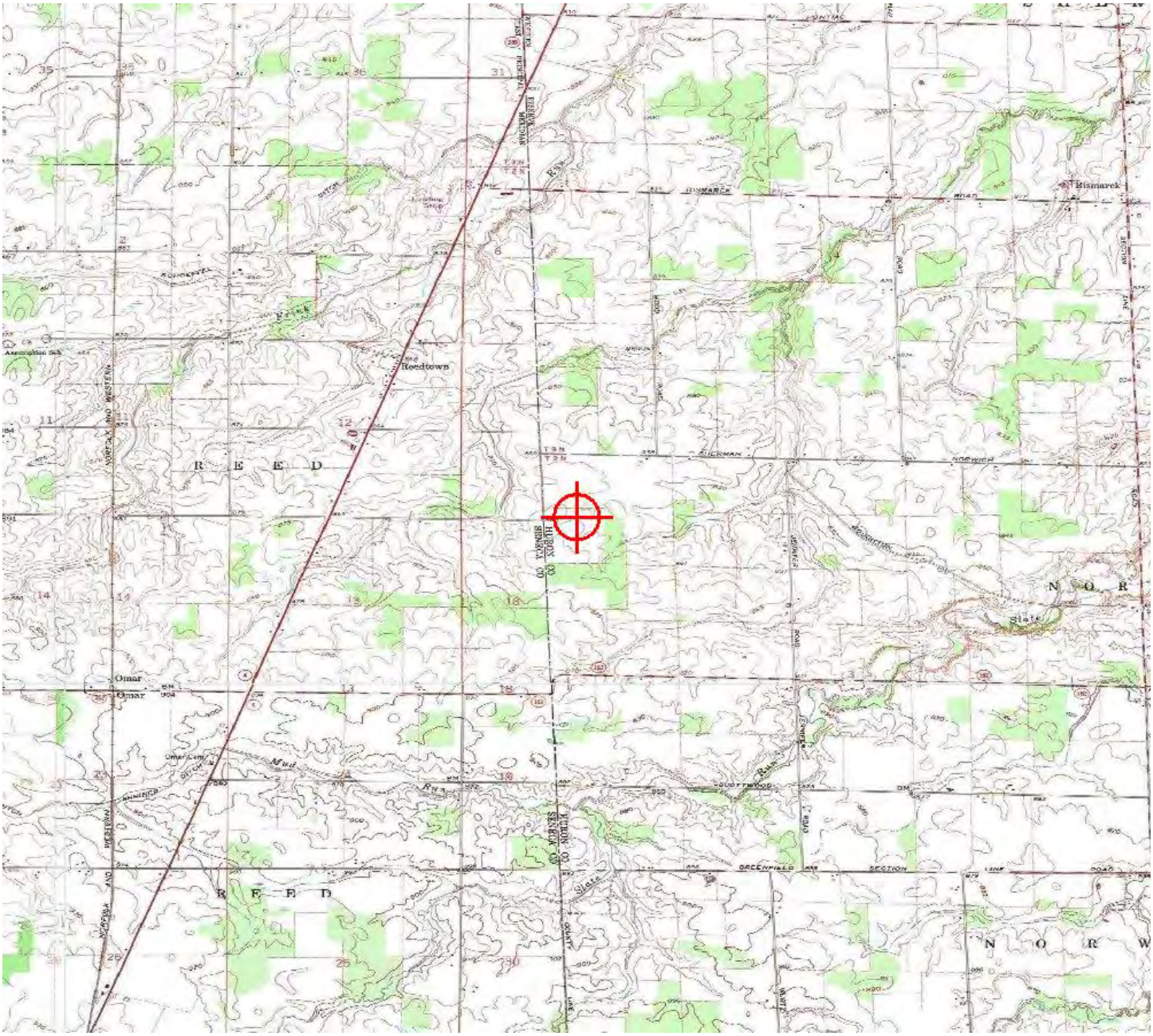
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11954-OE



Sectional Map for ASN 2018-WTE-11954-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11955-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T54
Location:	Bellevue, OH
Latitude:	41-08-20.55N NAD 83
Longitude:	82-46-14.82W
Heights:	834 feet site elevation (SE)
	659 feet above ground level (AGL)
	1493 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11955-OE.

Signature Control No: 392869108-430570656 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

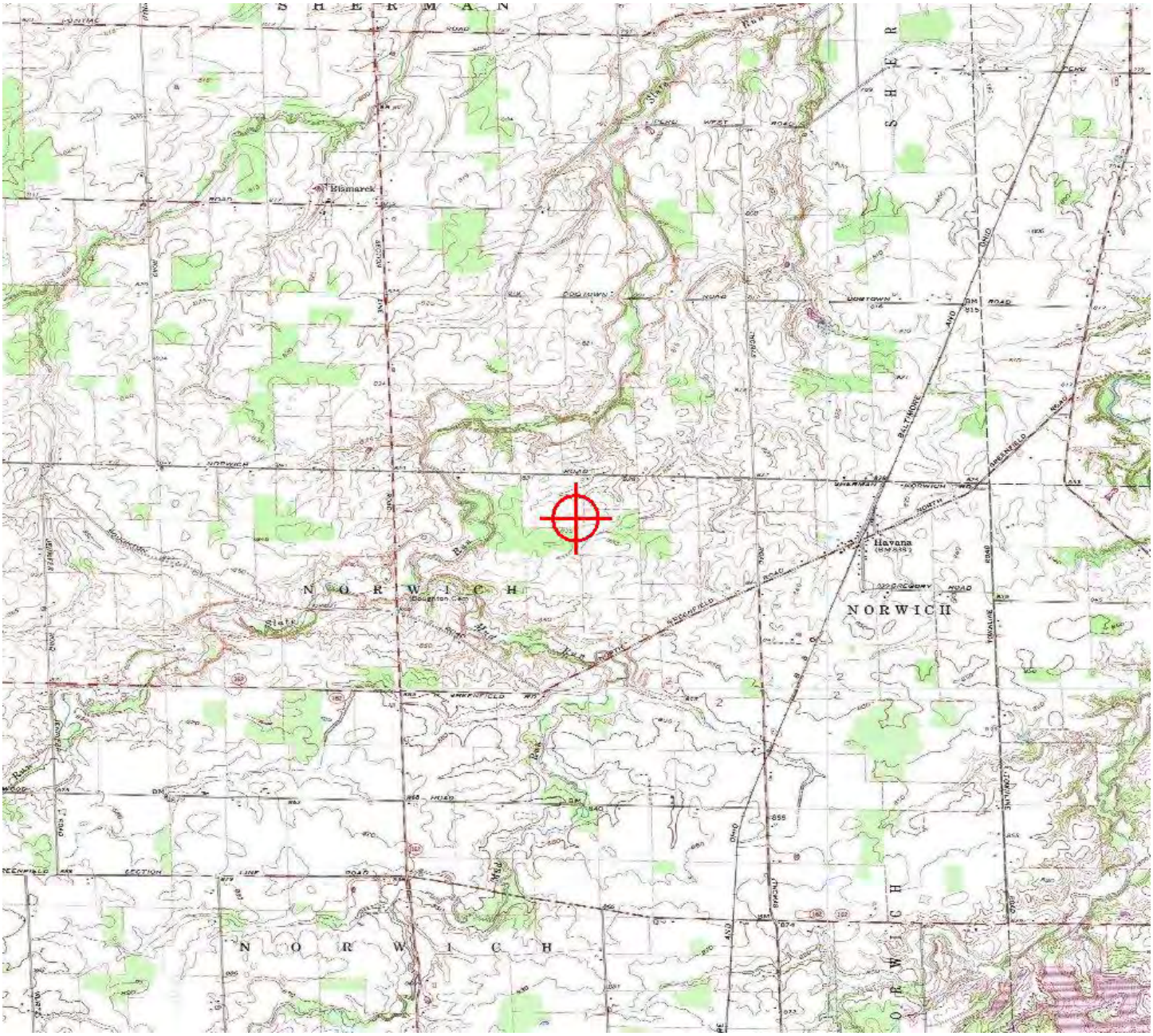
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

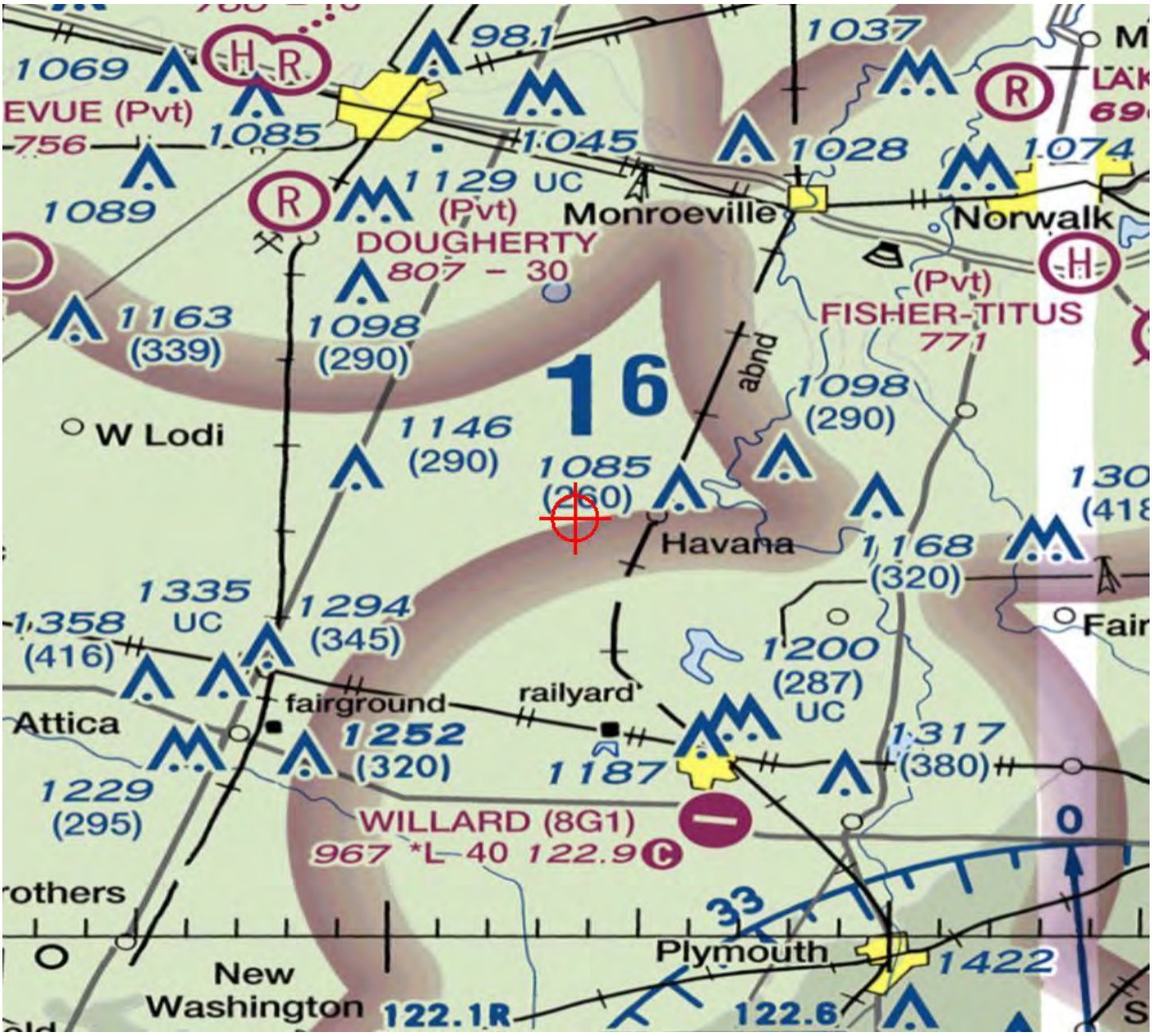
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11955-OE



Sectional Map for ASN 2018-WTE-11955-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11956-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T55
Location:	Bellevue, OH
Latitude:	41-08-15.32N NAD 83
Longitude:	82-46-36.45W
Heights:	836 feet site elevation (SE)
	659 feet above ground level (AGL)
	1495 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11956-OE.

Signature Control No: 392869109-430570662 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

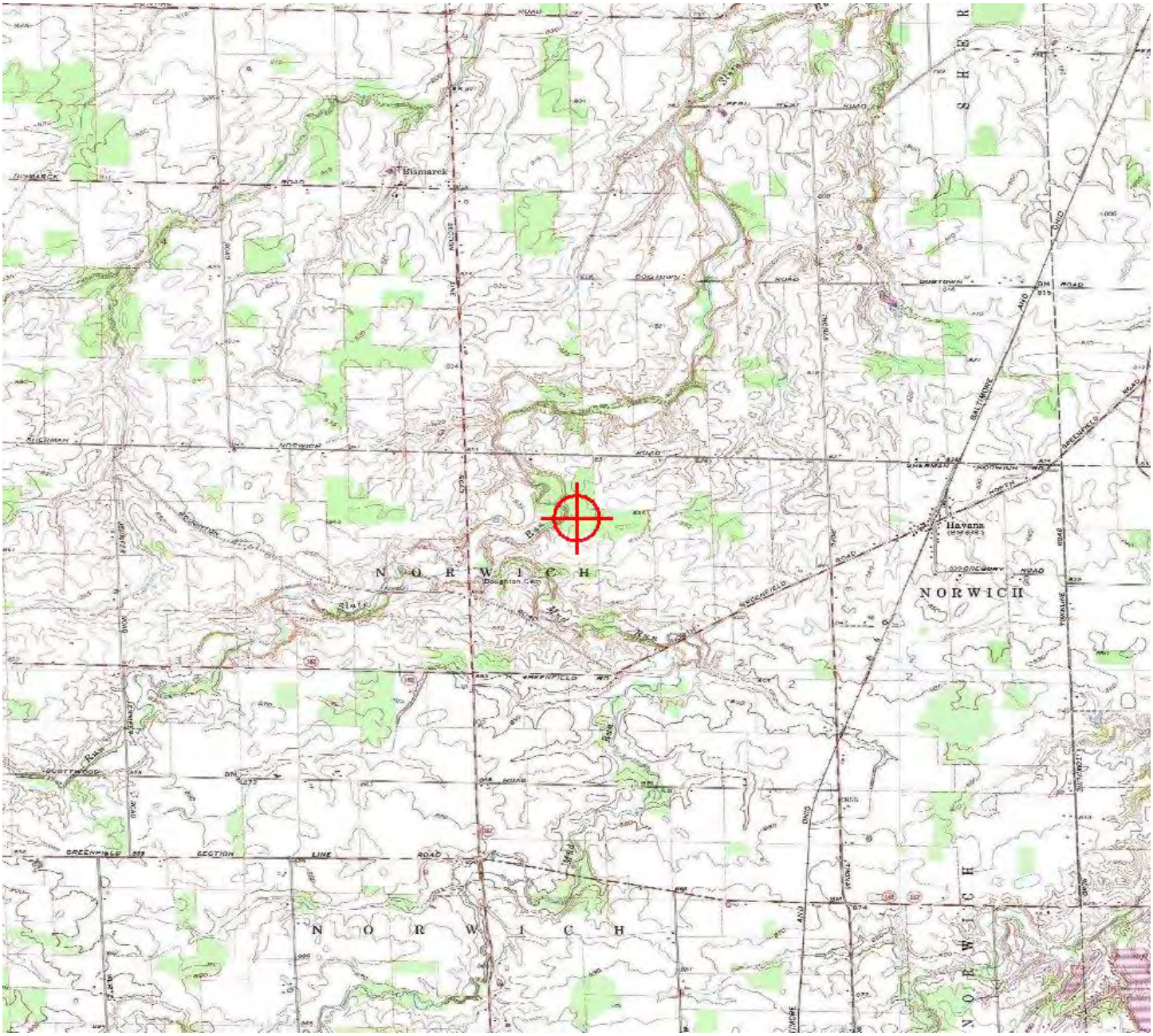
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

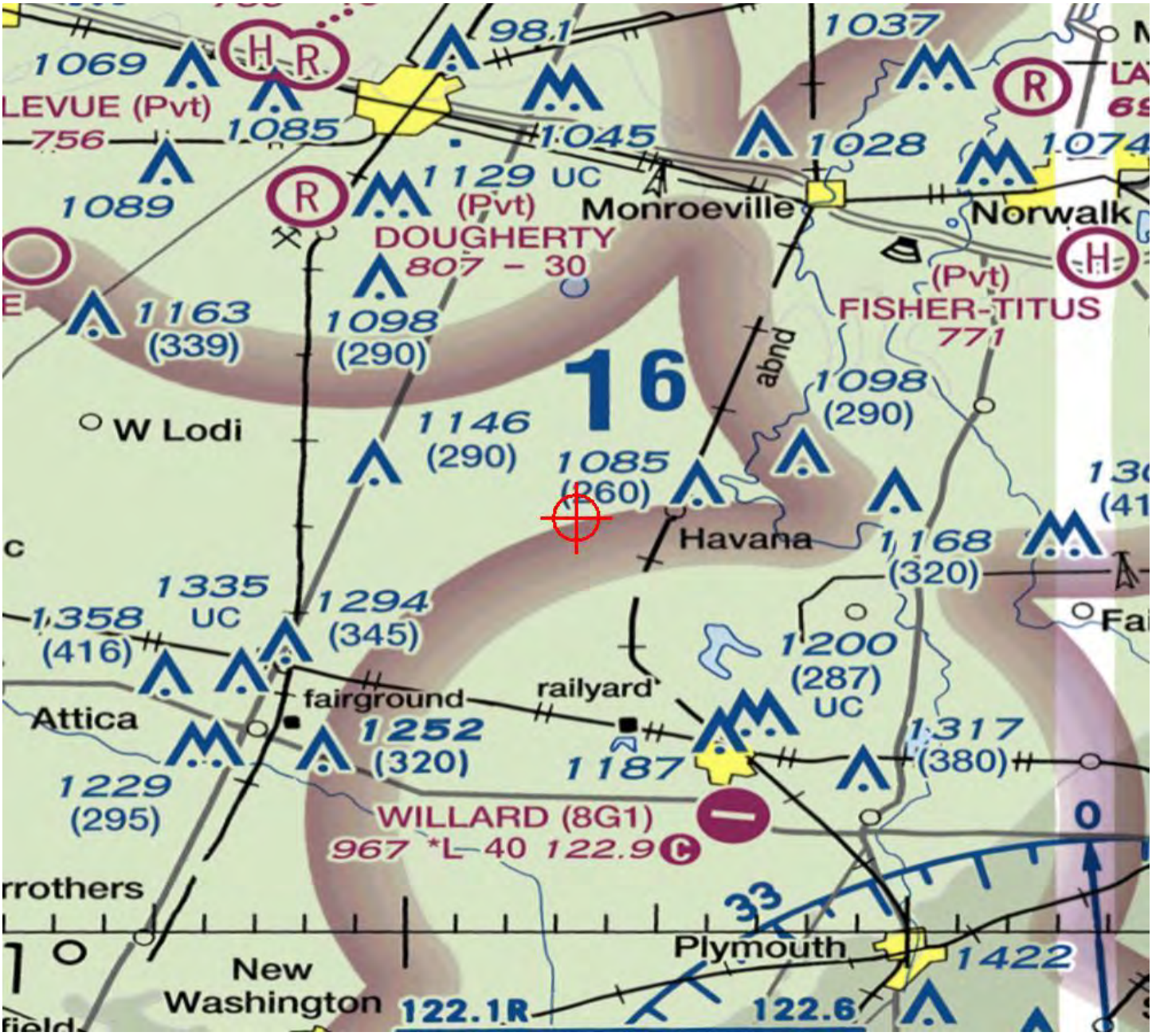
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11956-OE



Sectional Map for ASN 2018-WTE-11956-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11957-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T56
Location:	Bellevue, OH
Latitude:	41-08-13.84N NAD 83
Longitude:	82-47-29.27W
Heights:	850 feet site elevation (SE)
	659 feet above ground level (AGL)
	1509 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11957-OE.

Signature Control No: 392869110-430561925 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

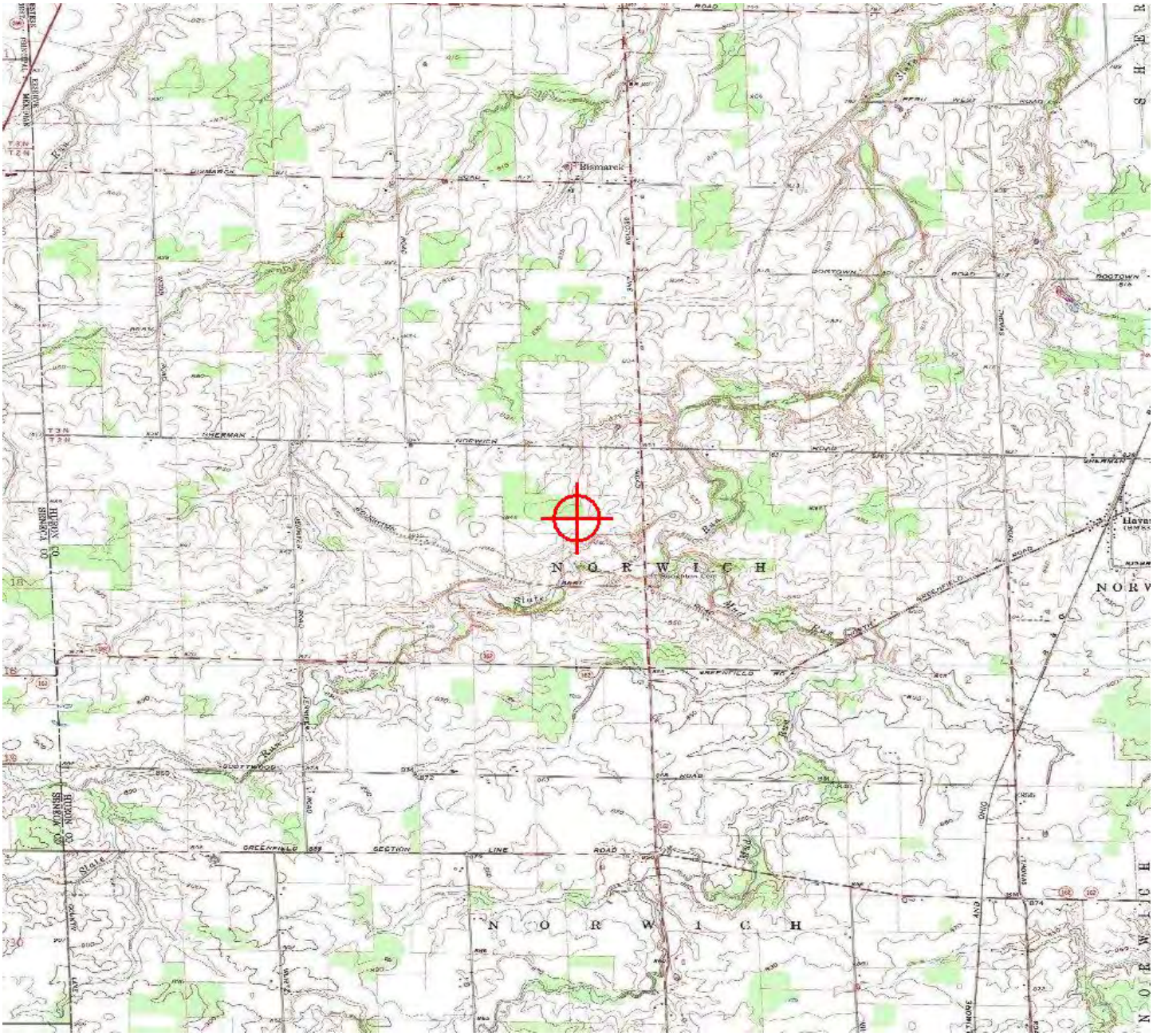
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

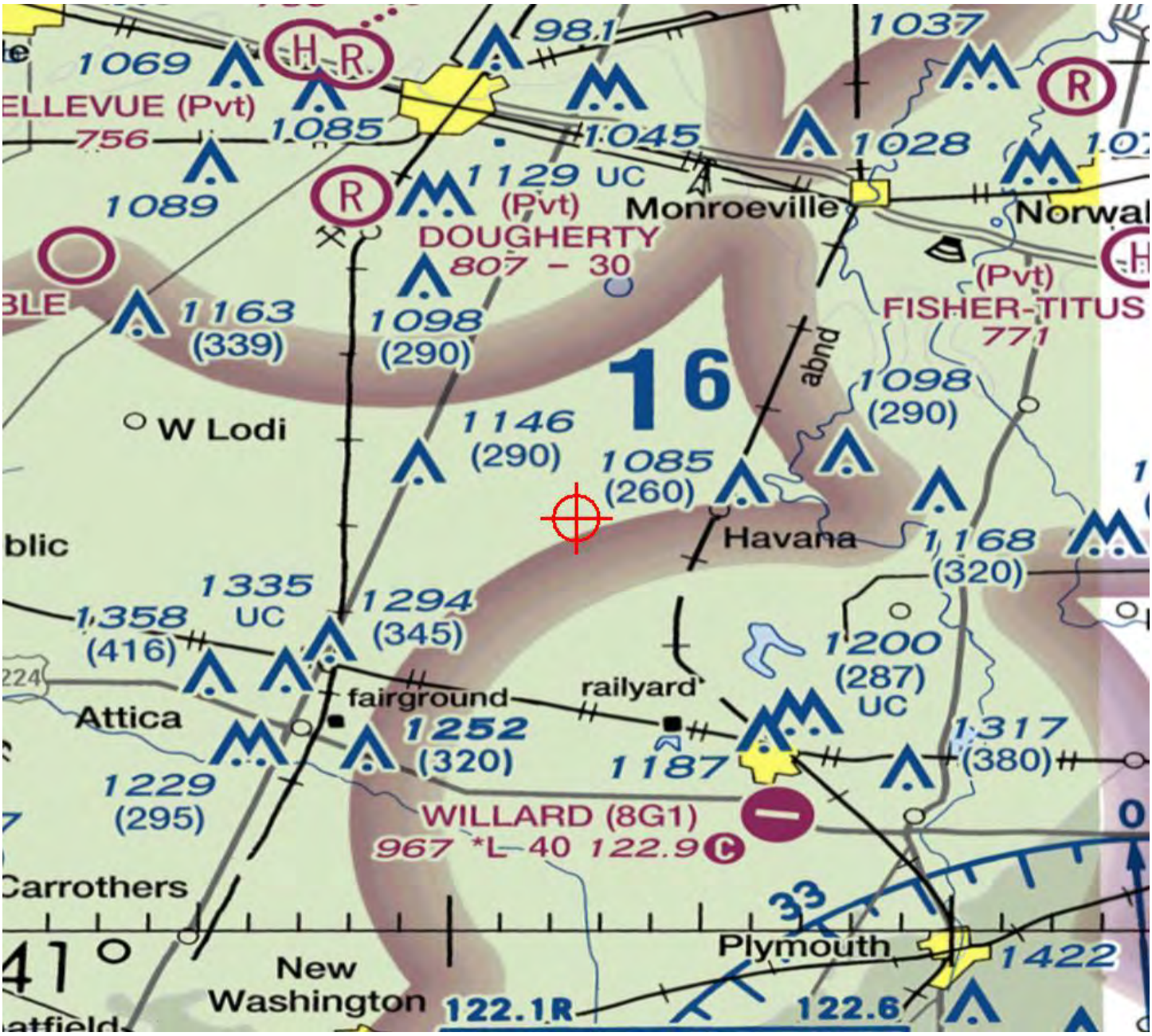
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11957-OE


NORWICH
NORWICH
GREENFIELD
SECTION LINE ROAD
SHERMAN
NORWICH ROAD
BOGTOWN ROAD
Bismarck
Slate
Slate
Slate Run
Flats
Flats
Flats

Sectional Map for ASN 2018-WTE-11957-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11958-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T57
Location:	Bellevue, OH
Latitude:	41-08-10.51N NAD 83
Longitude:	82-49-32.23W
Heights:	858 feet site elevation (SE)
	659 feet above ground level (AGL)
	1517 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11958-OE.

Signature Control No: 392869111-430570672 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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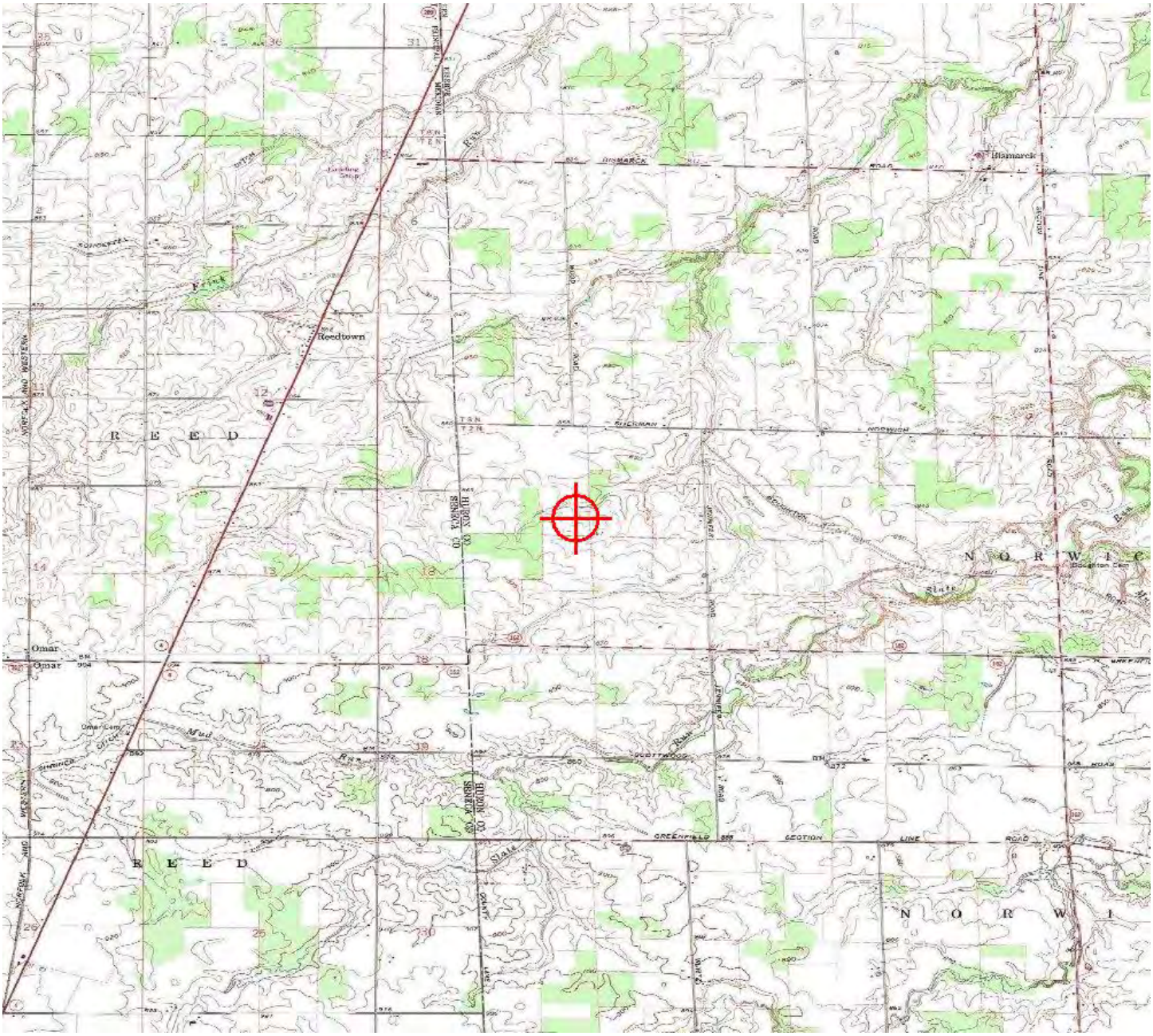
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

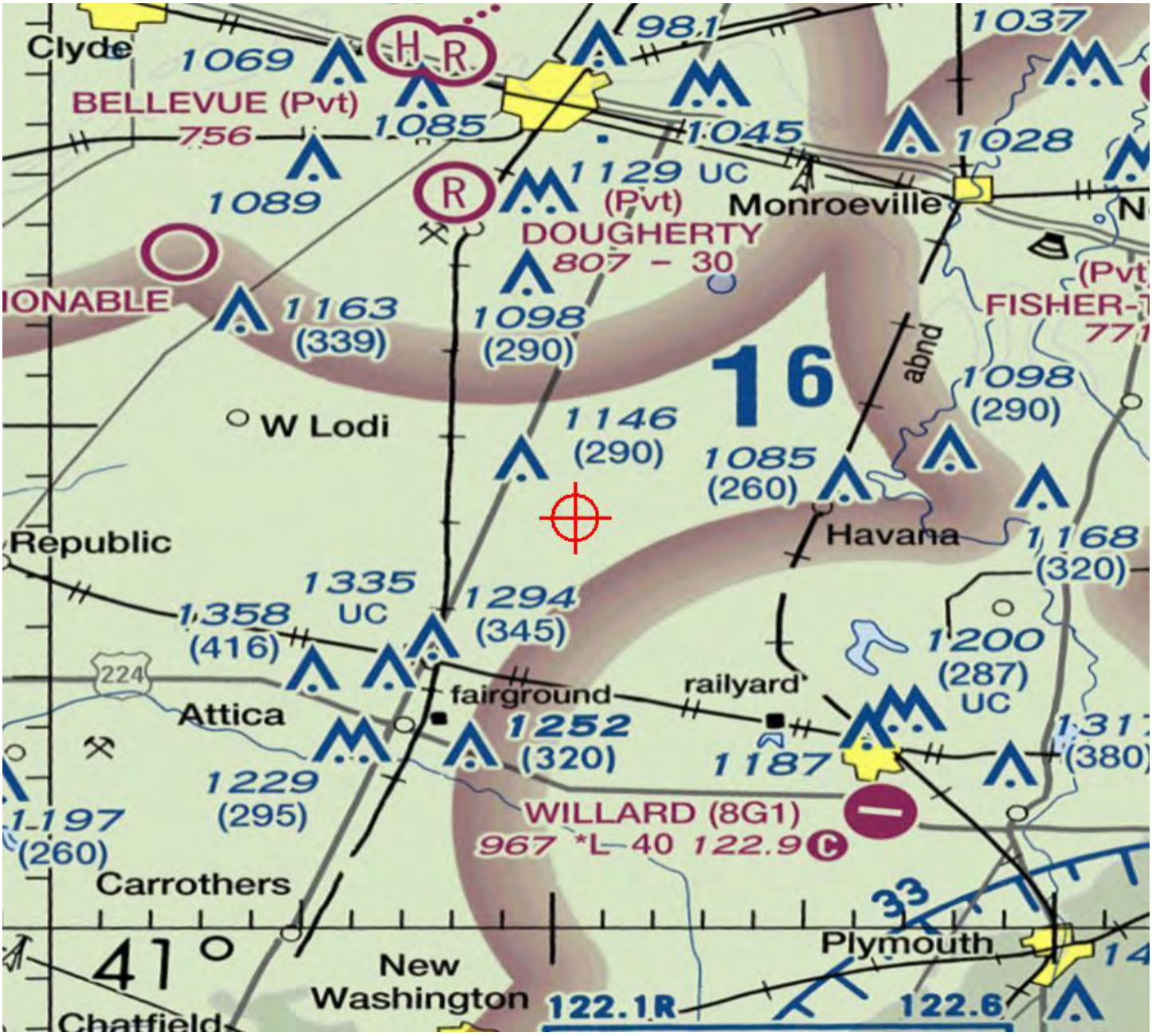
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11958-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11959-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T58
Location:	Bellevue, OH
Latitude:	41-07-57.73N NAD 83
Longitude:	82-46-08.52W
Heights:	840 feet site elevation (SE)
	659 feet above ground level (AGL)
	1499 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11959-OE.

Signature Control No: 392869112-430570684 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
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2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

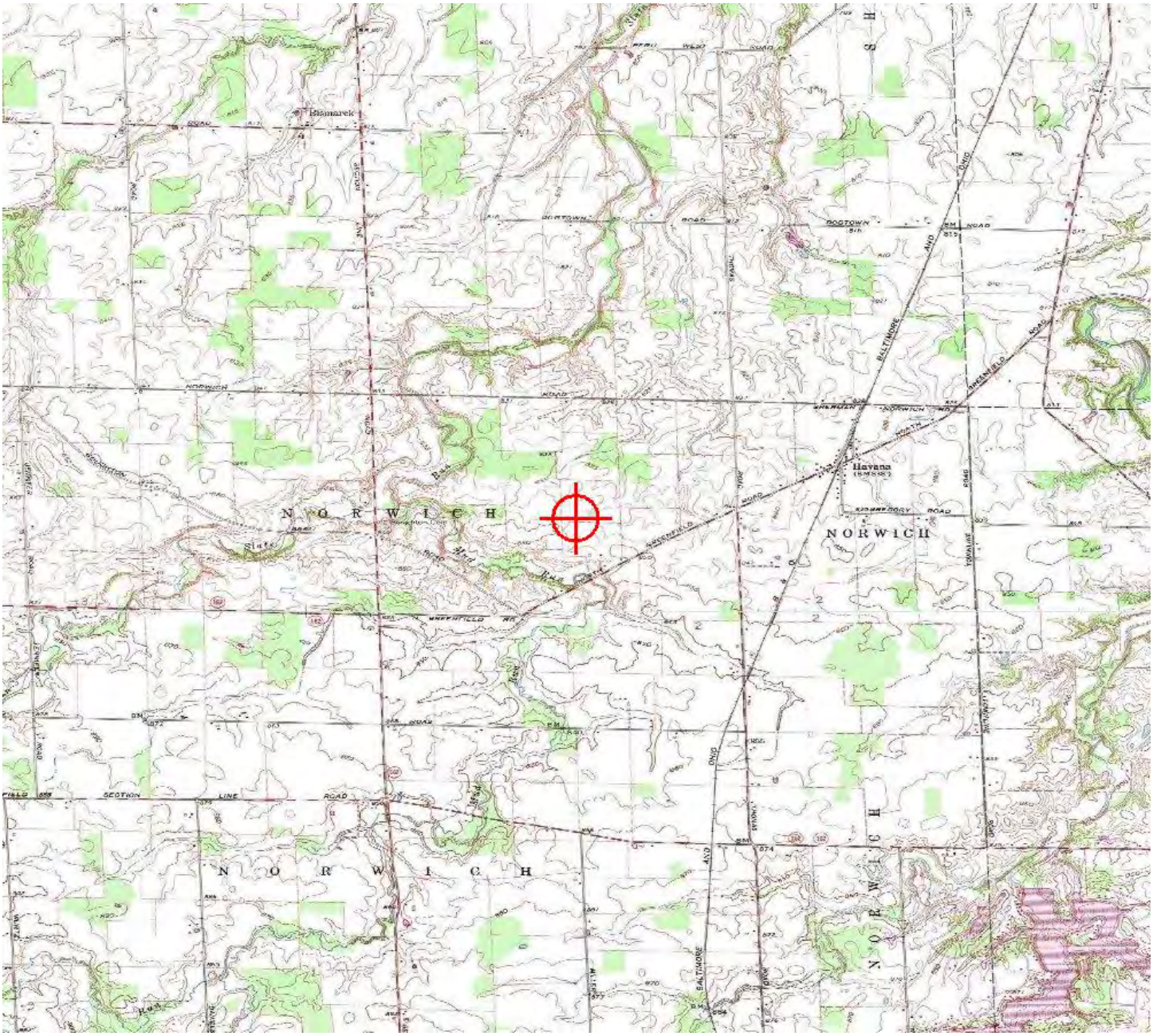
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

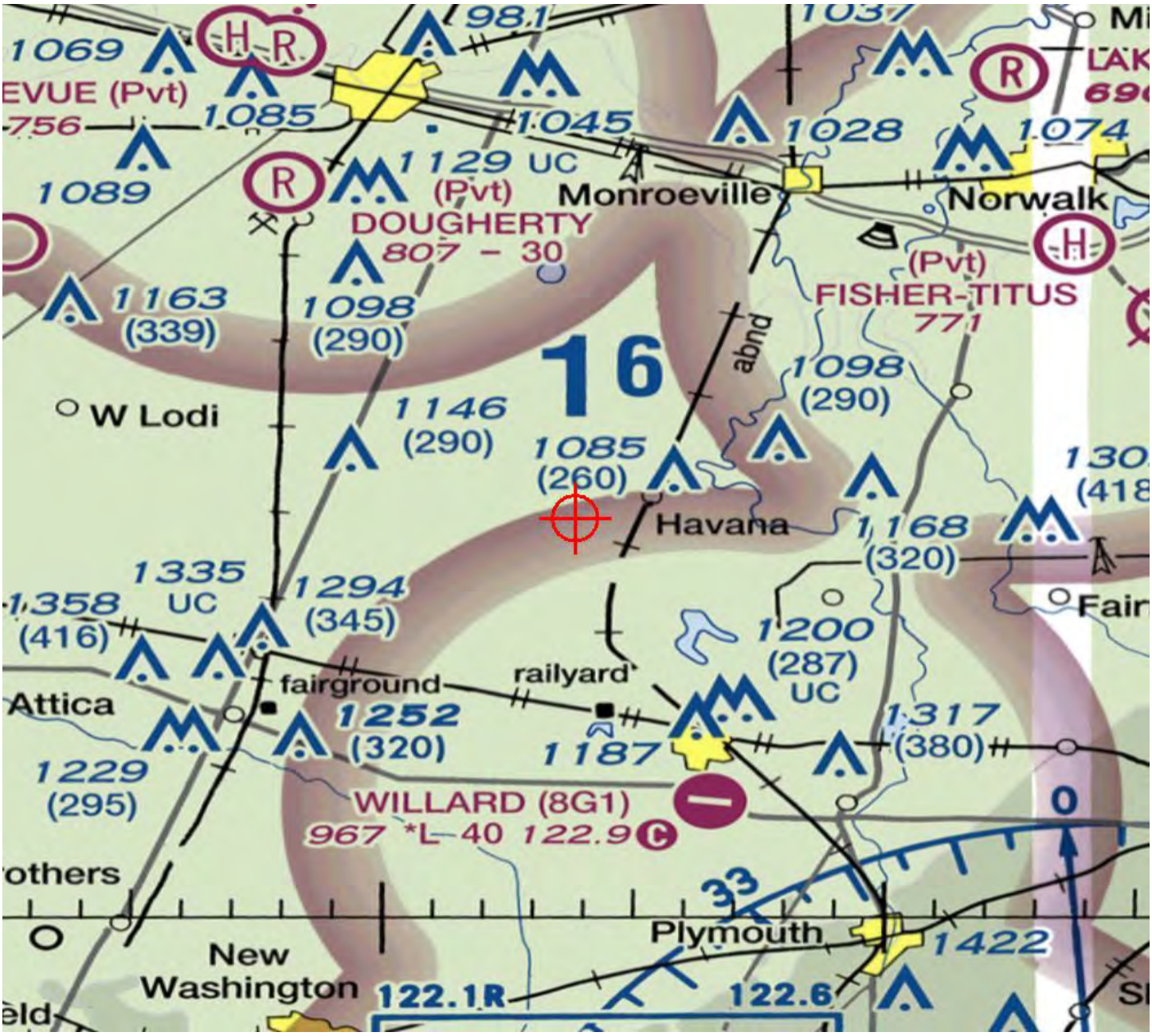
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11959-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11960-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T59
Location:	Bellevue, OH
Latitude:	41-07-50.95N NAD 83
Longitude:	82-49-19.41W
Heights:	860 feet site elevation (SE)
	659 feet above ground level (AGL)
	1519 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11960-OE.

Signature Control No: 392869113-430570691 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

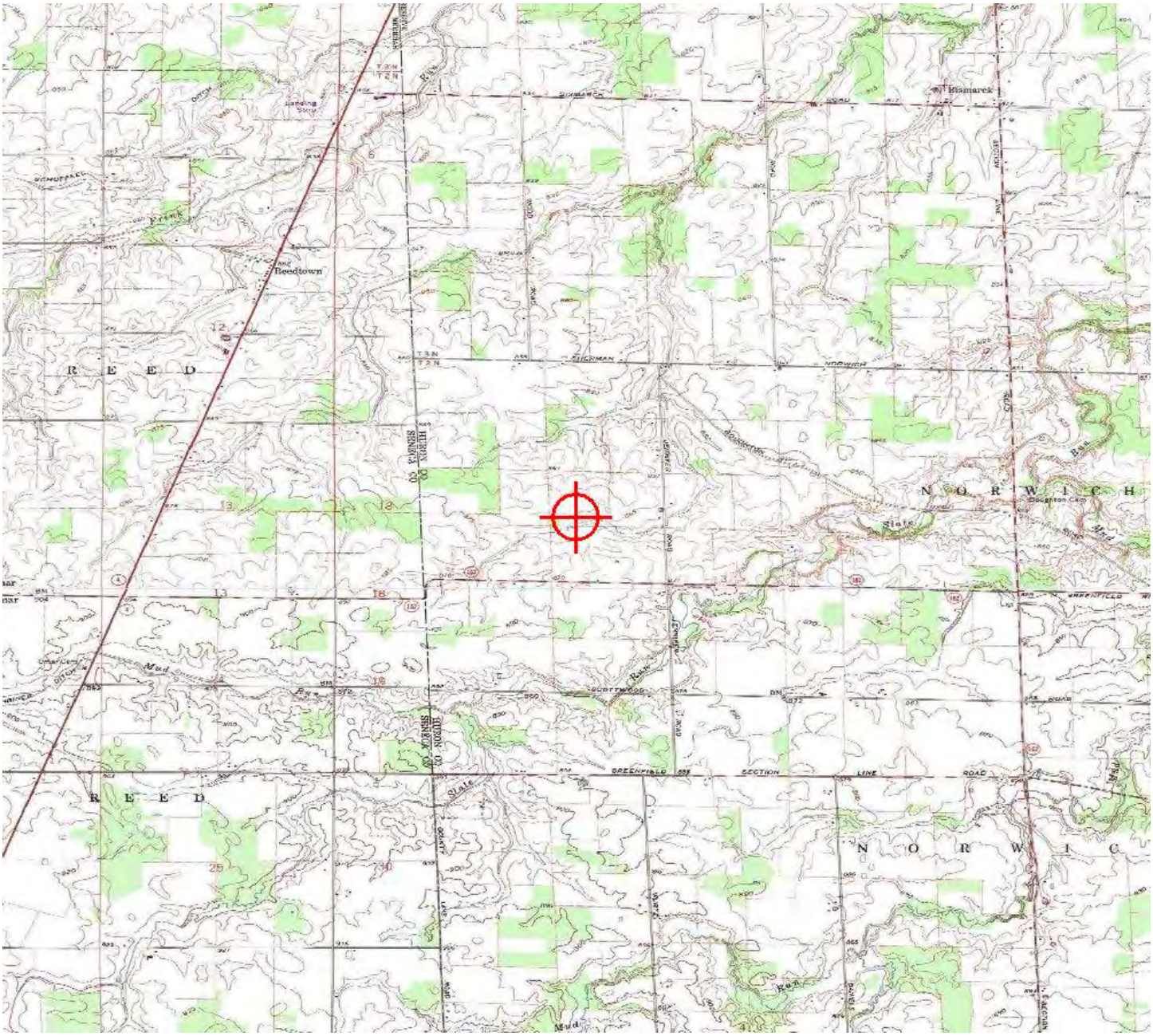
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

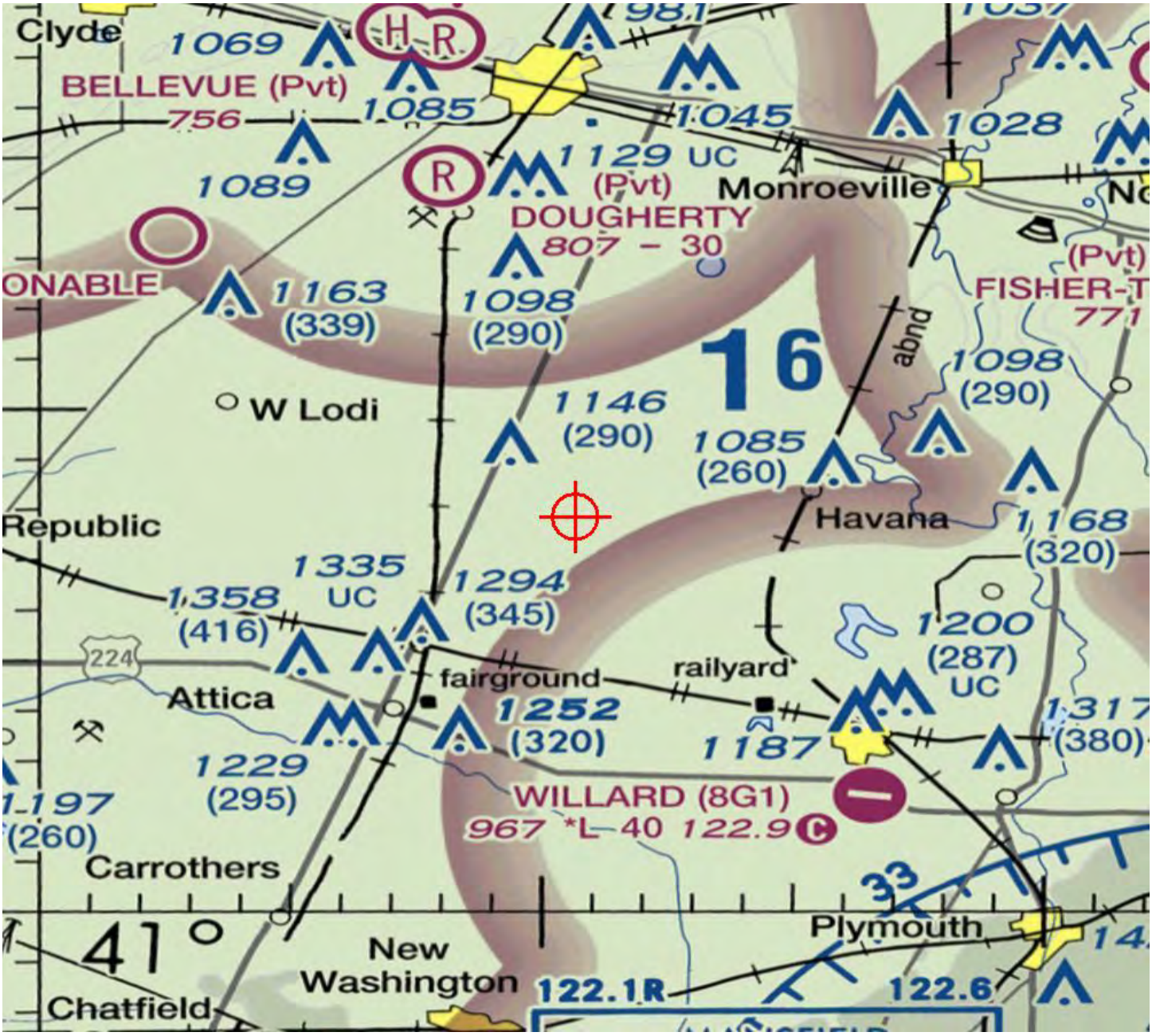
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11960-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11962-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T60
Location:	Bellevue, OH
Latitude:	41-06-56.14N NAD 83
Longitude:	82-44-39.92W
Heights:	854 feet site elevation (SE)
	659 feet above ground level (AGL)
	1513 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11962-OE.

Signature Control No: 392869115-430561935 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

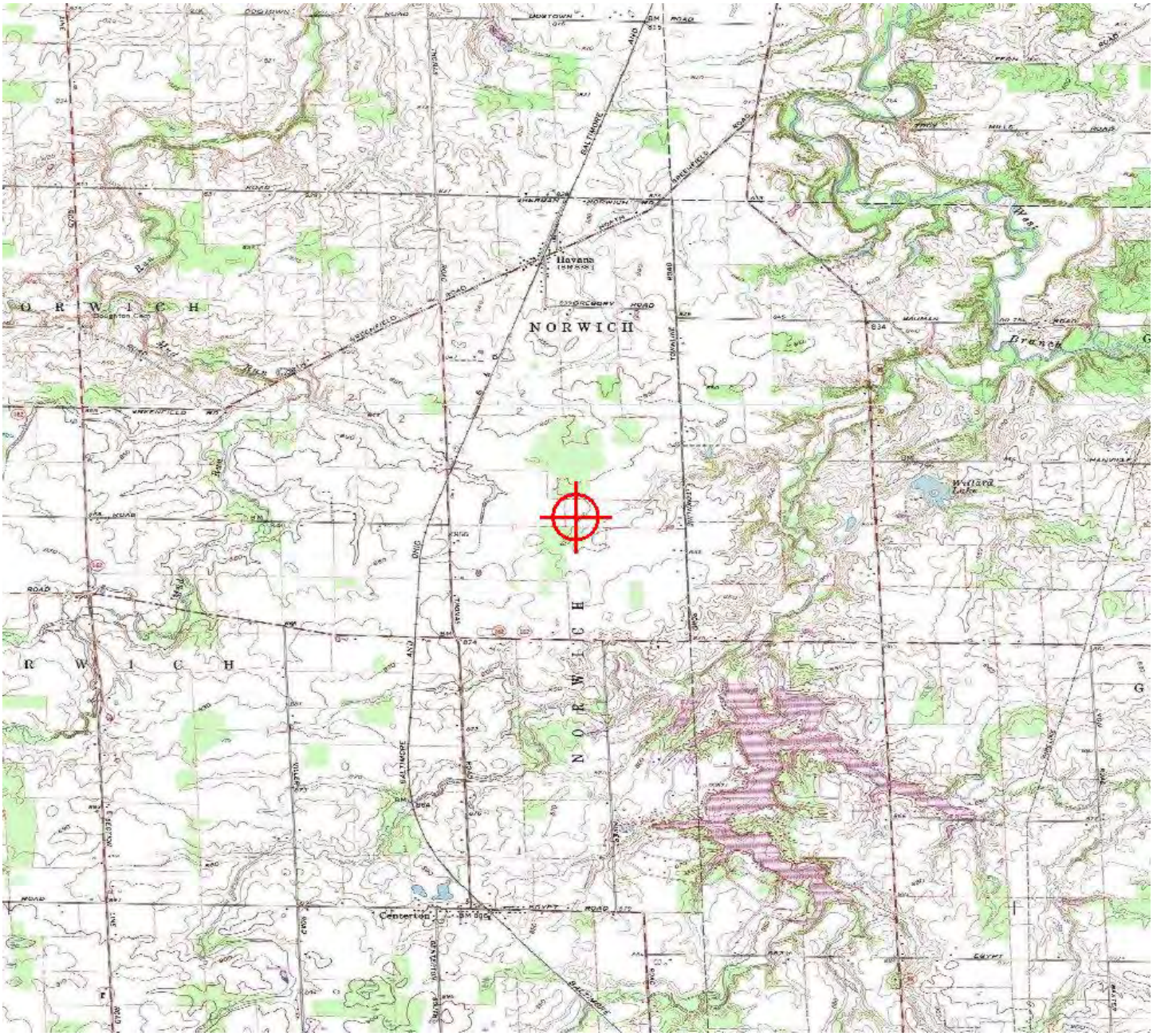
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

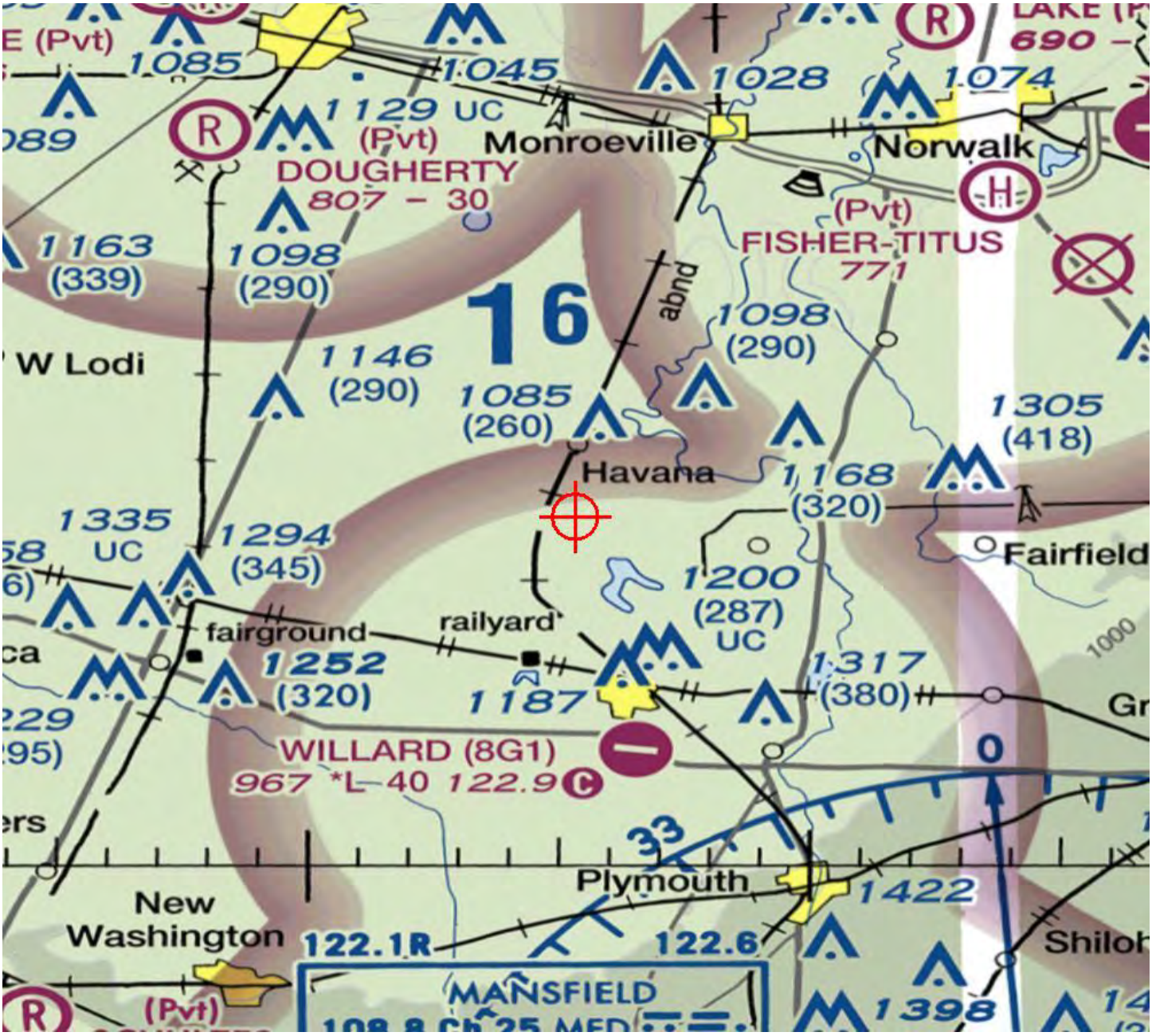
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11962-OE



Sectional Map for ASN 2018-WTE-11962-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11963-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T61
Location:	Bellevue, OH
Latitude:	41-06-49.98N NAD 83
Longitude:	82-48-33.74W
Heights:	880 feet site elevation (SE)
	659 feet above ground level (AGL)
	1539 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11963-OE.

Signature Control No: 392869116-430561942 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

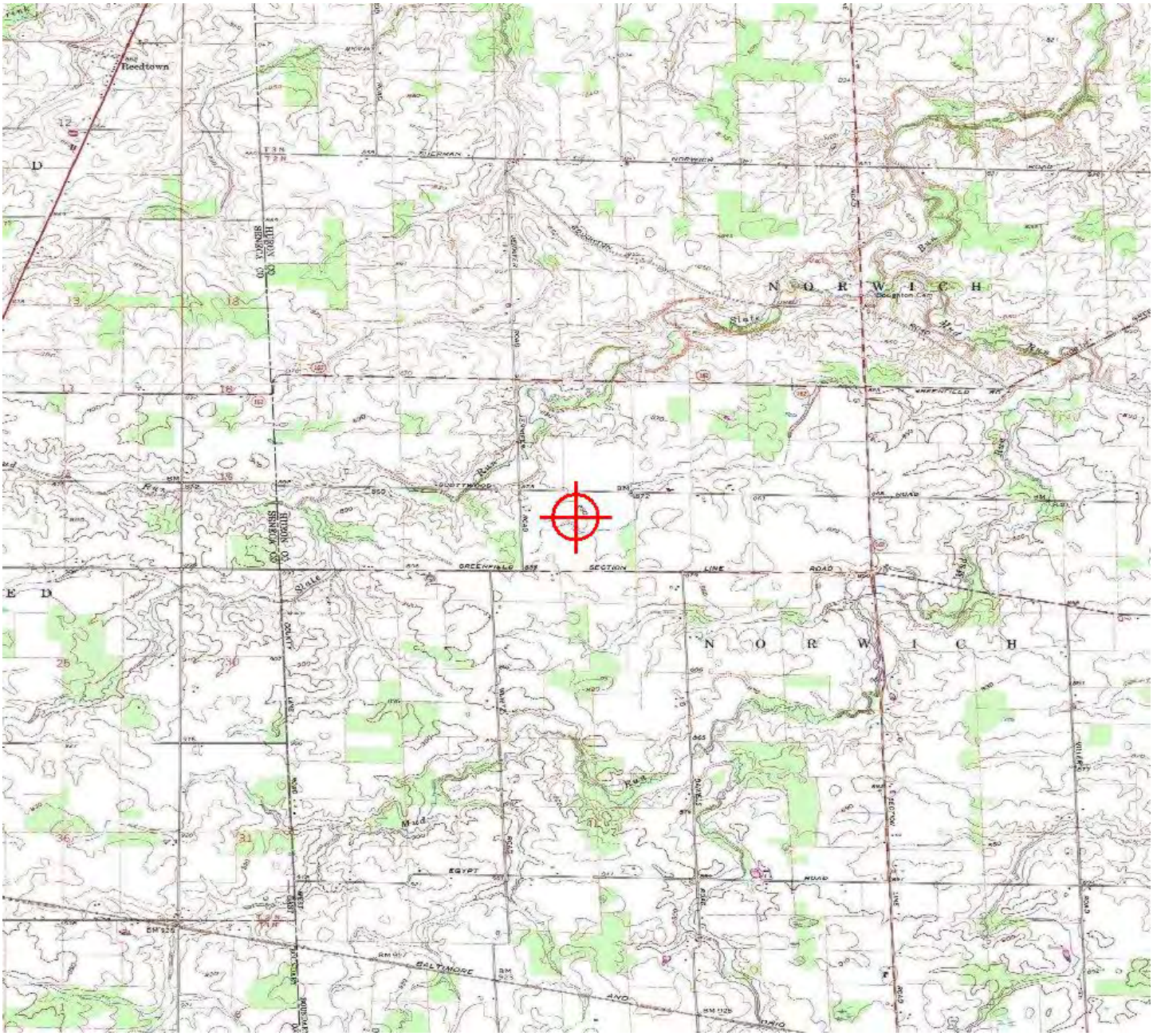
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

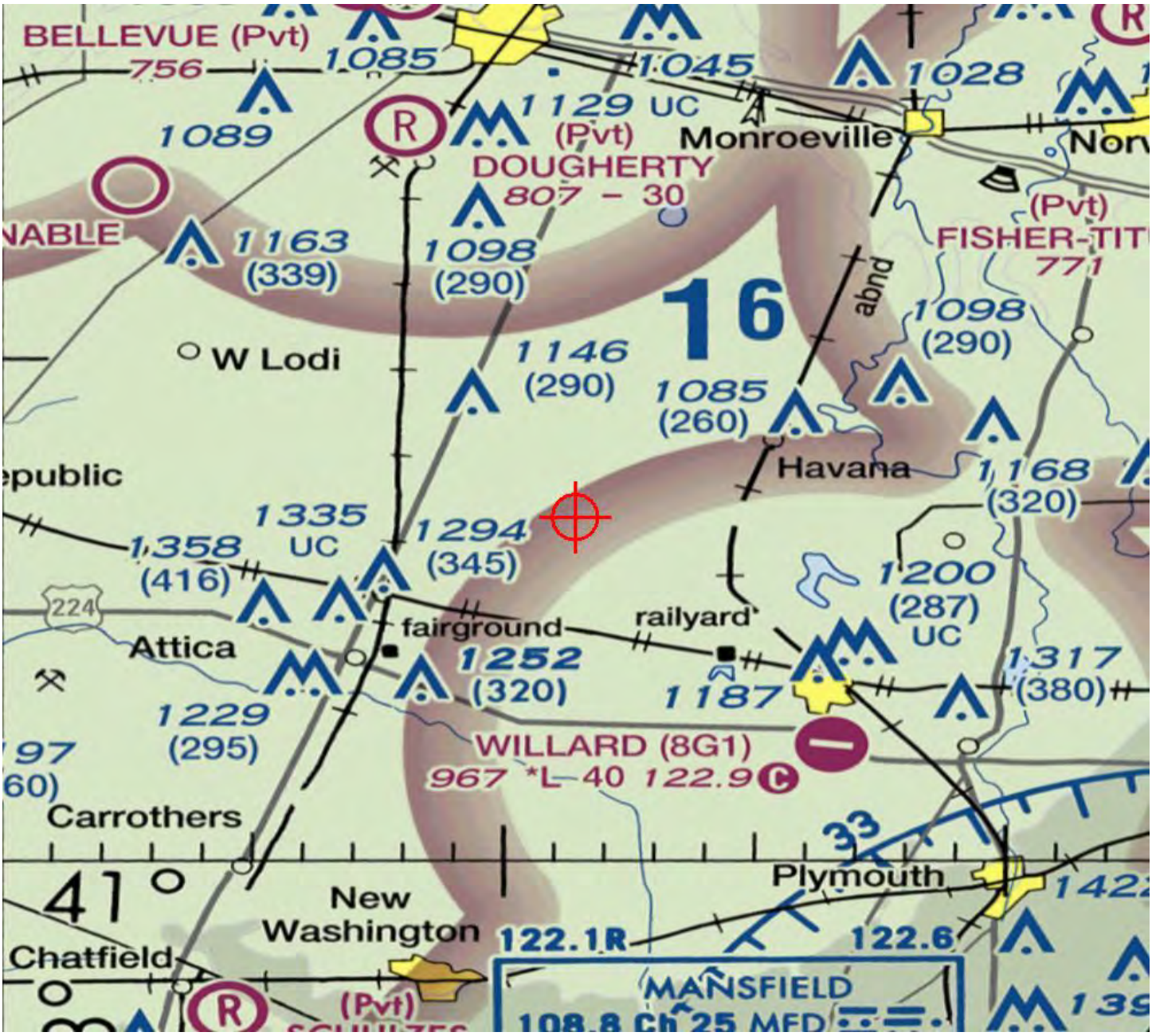
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11963-OE



Sectional Map for ASN 2018-WTE-11963-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11964-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T62
Location:	Bellevue, OH
Latitude:	41-06-39.47N NAD 83
Longitude:	82-44-39.47W
Heights:	860 feet site elevation (SE)
	659 feet above ground level (AGL)
	1519 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11964-OE.

Signature Control No: 392869117-430561934 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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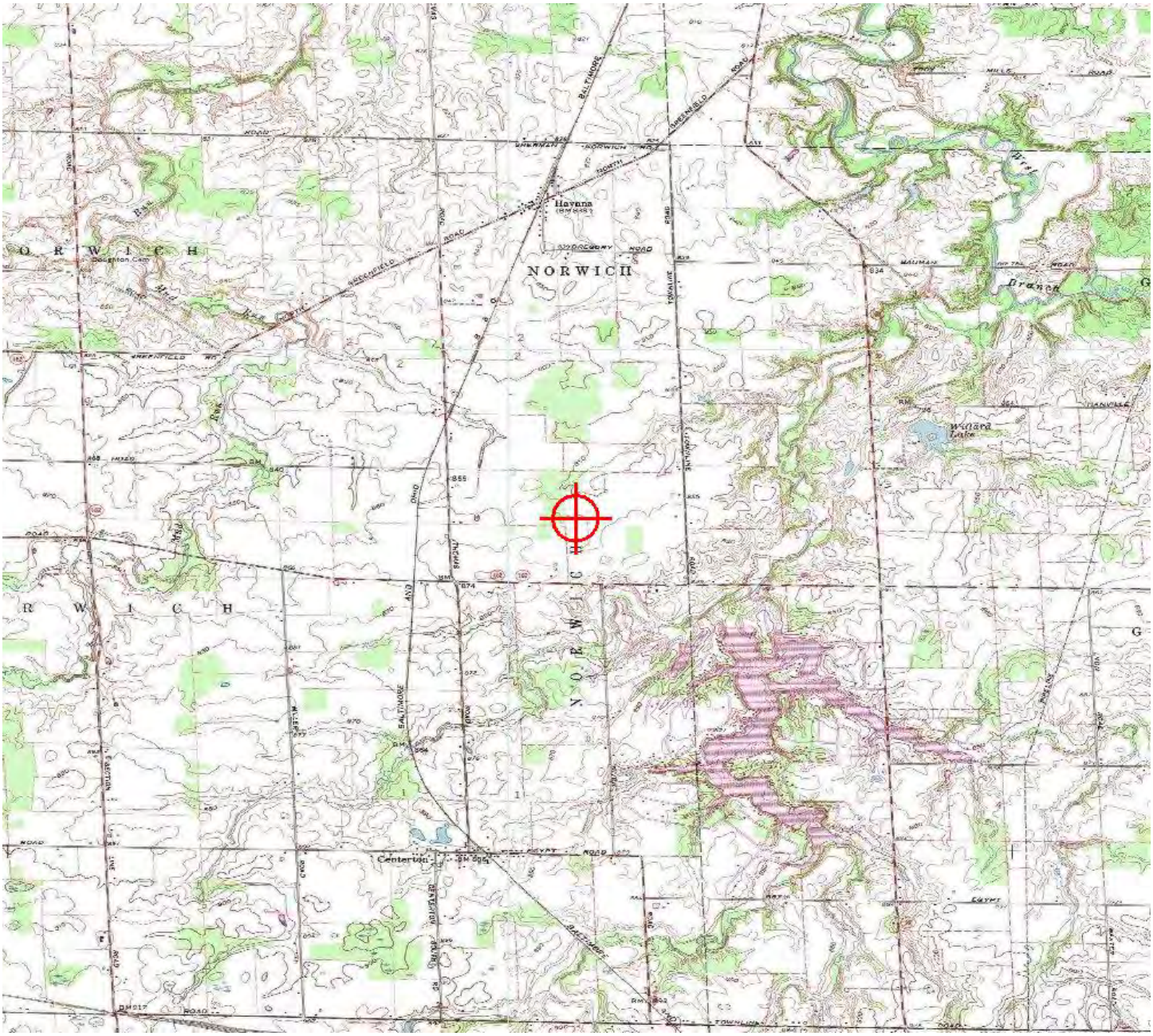
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

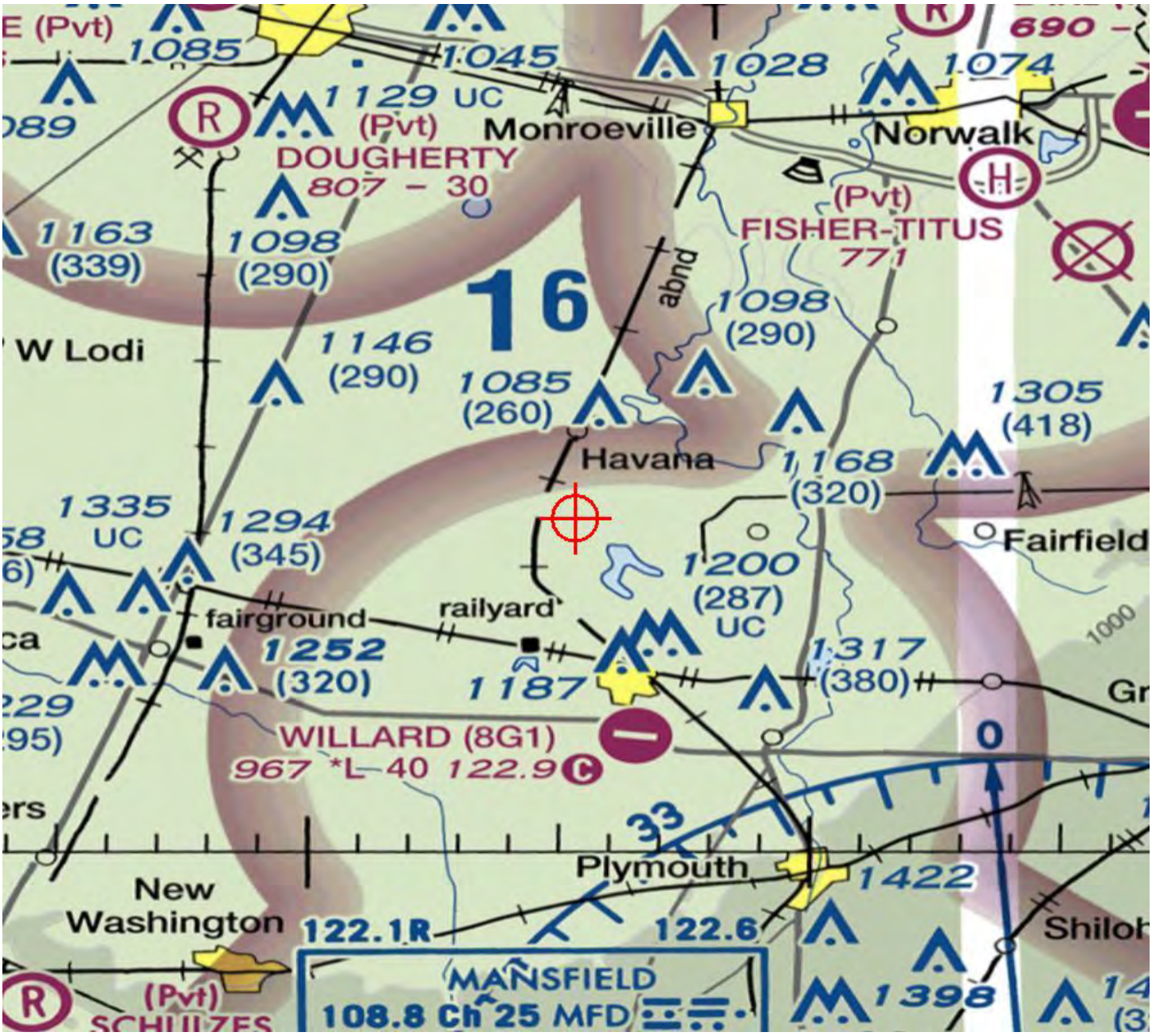
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11964-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11965-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T63
Location:	Bellevue, OH
Latitude:	41-06-27.36N NAD 83
Longitude:	82-48-25.46W
Heights:	886 feet site elevation (SE)
	659 feet above ground level (AGL)
	1545 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11965-OE.

Signature Control No: 392869118-430561930 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

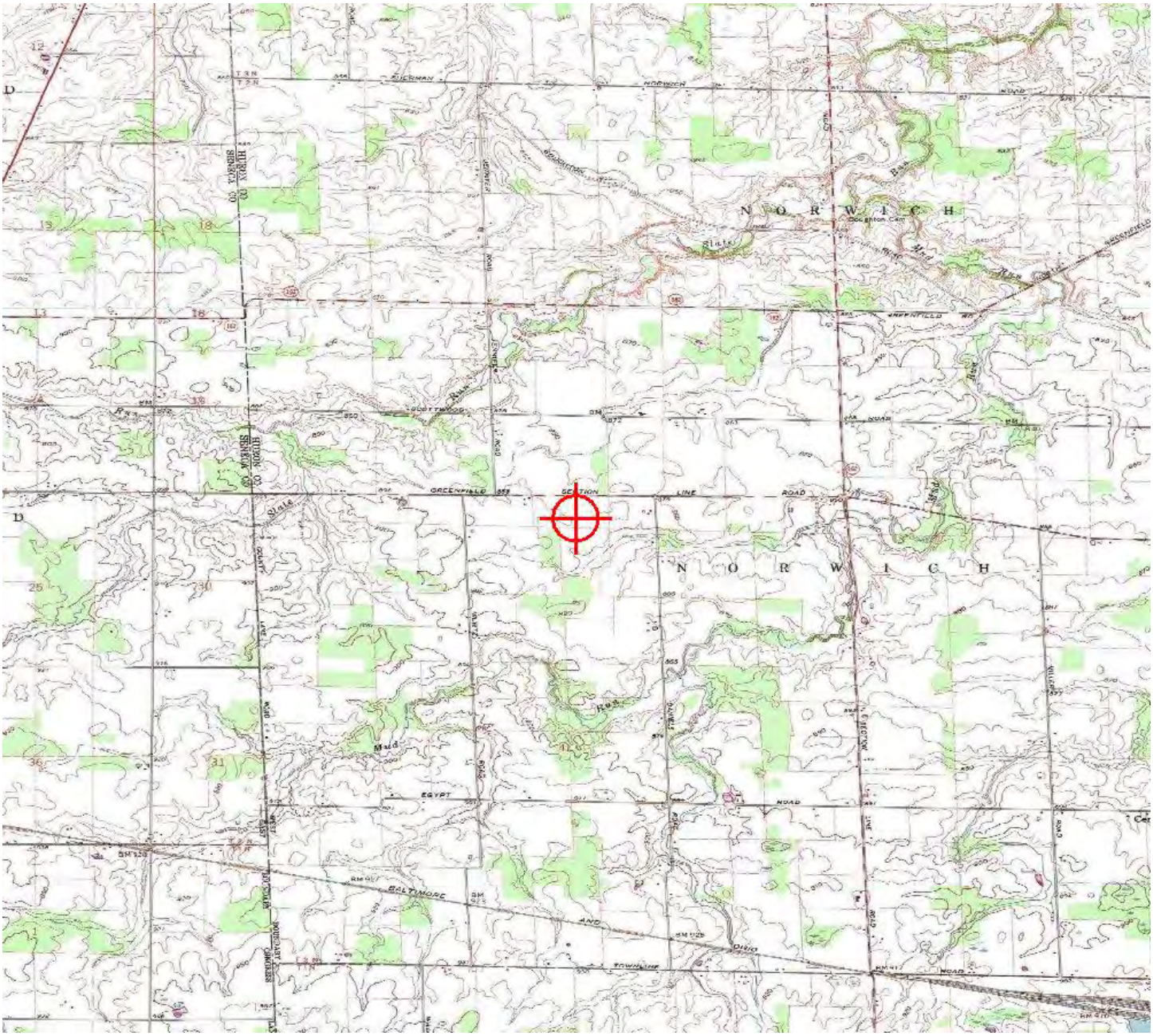
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

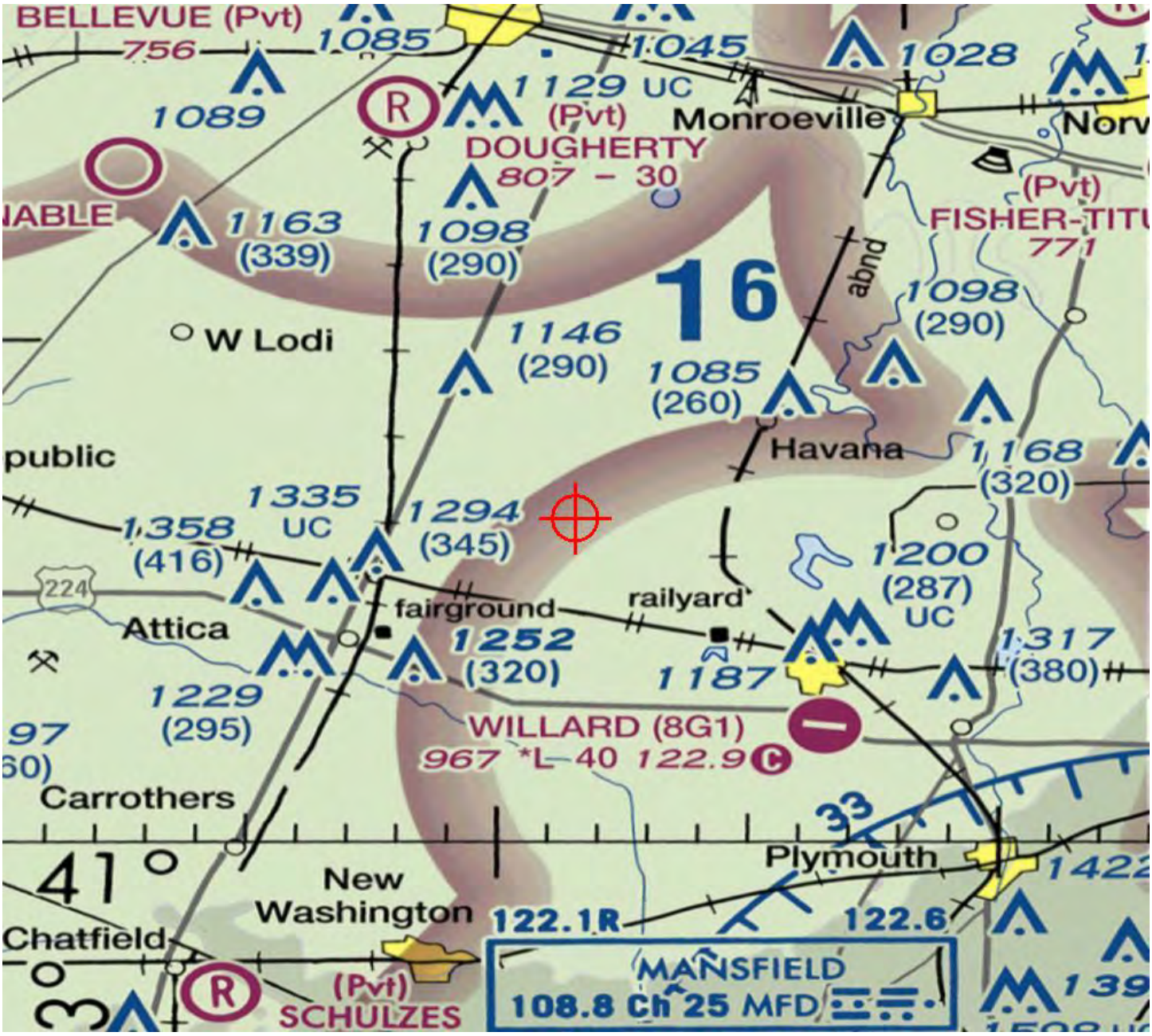
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11965-OE

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SCHULZES

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11966-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T64
Location:	Bellevue, OH
Latitude:	41-05-54.65N NAD 83
Longitude:	82-49-40.26W
Heights:	902 feet site elevation (SE)
	659 feet above ground level (AGL)
	1561 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11966-OE.

Signature Control No: 392869119-430561928 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

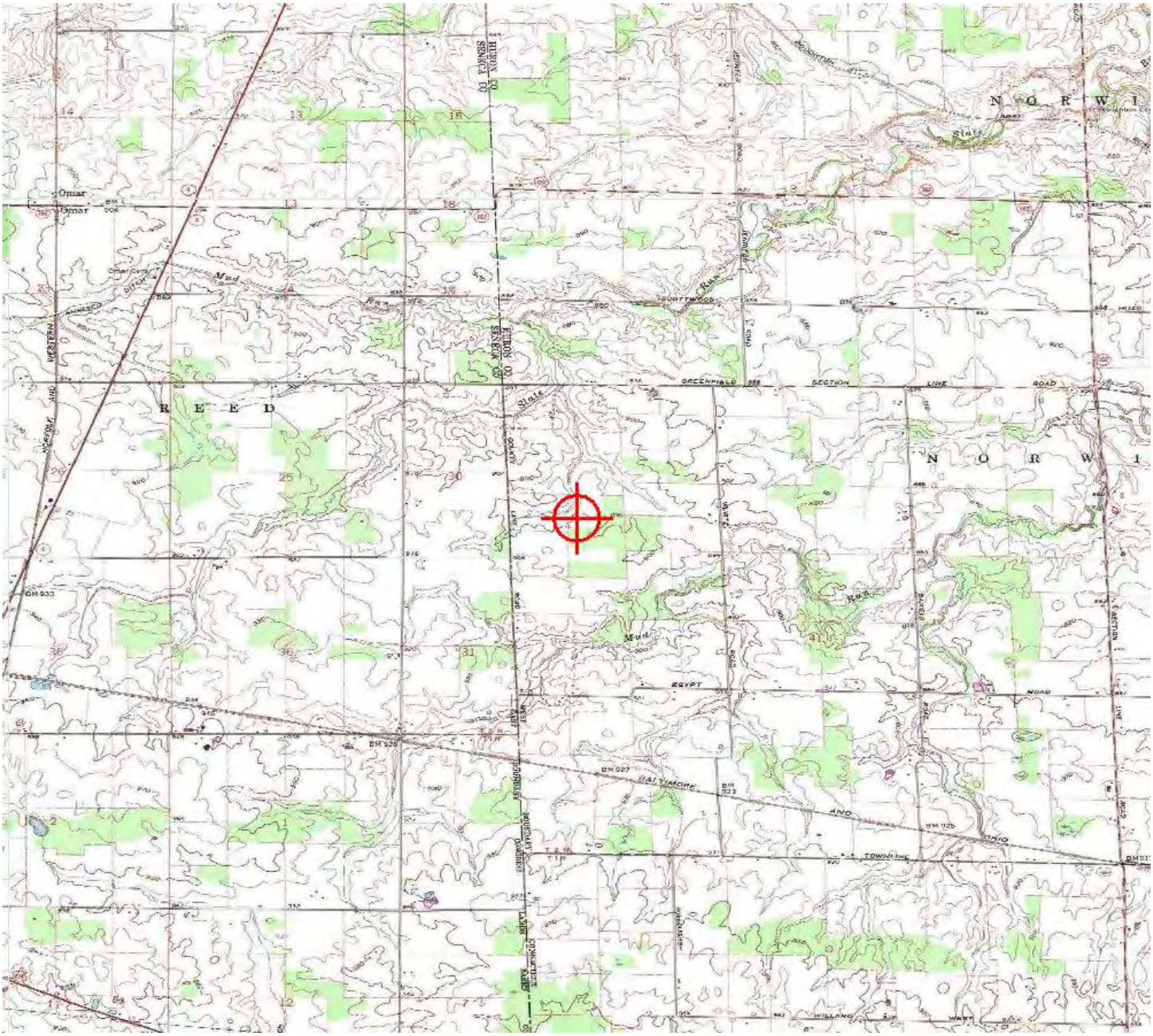
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11966-OE



Sectional Map for ASN 2018-WTE-11966-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11967-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T65
Location:	Bellevue, OH
Latitude:	41-05-47.68N NAD 83
Longitude:	82-48-24.50W
Heights:	894 feet site elevation (SE)
	659 feet above ground level (AGL)
	1553 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 56 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/21/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11967-OE.

Signature Control No: 392869120-430559834 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

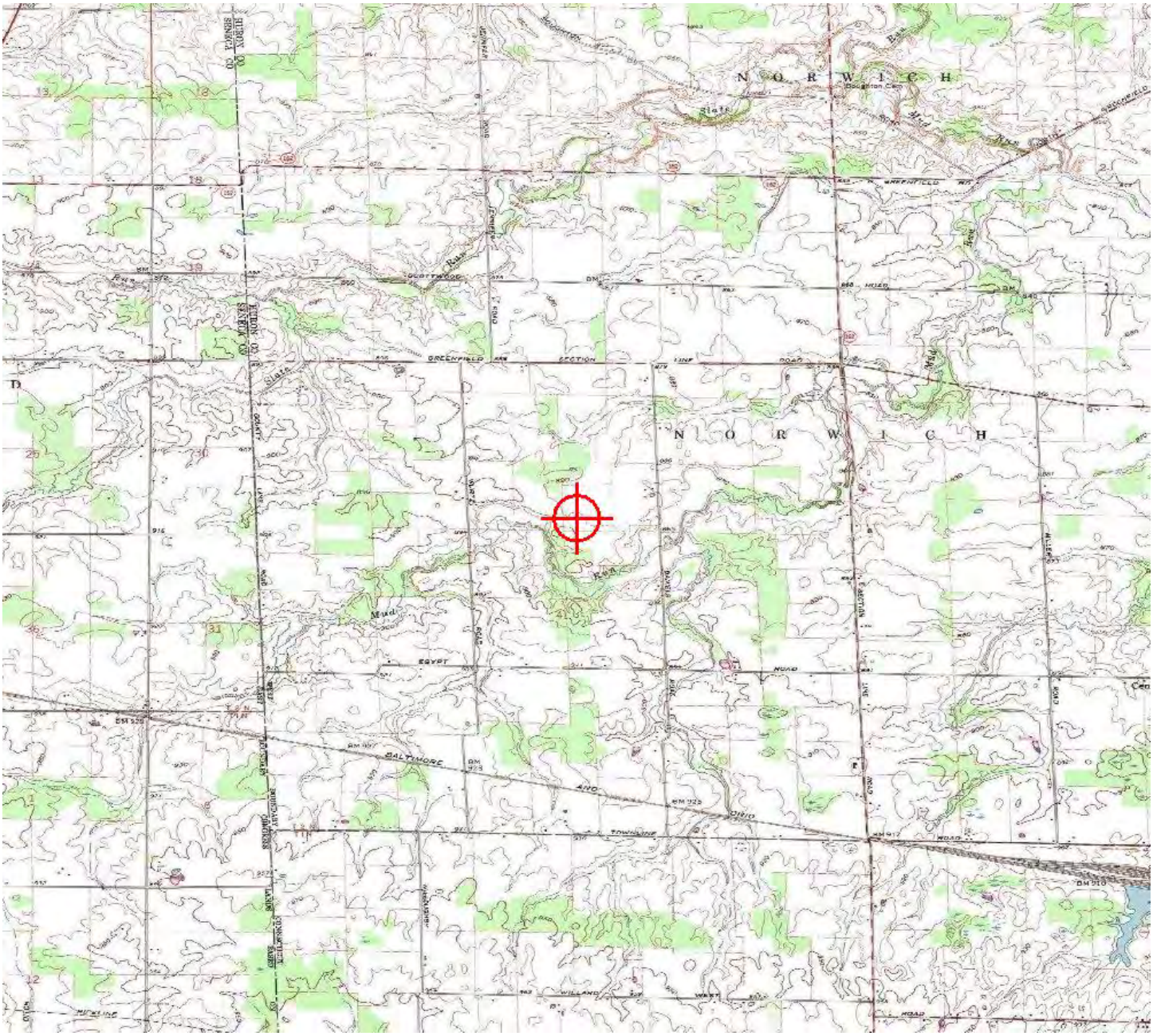
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11967-OE



Sectional Map for ASN 2018-WTE-11967-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11968-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T66
Location:	Bellevue, OH
Latitude:	41-05-44.33N NAD 83
Longitude:	82-45-49.33W
Heights:	878 feet site elevation (SE)
	659 feet above ground level (AGL)
	1537 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11968-OE.

Signature Control No: 392869121-430561941 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

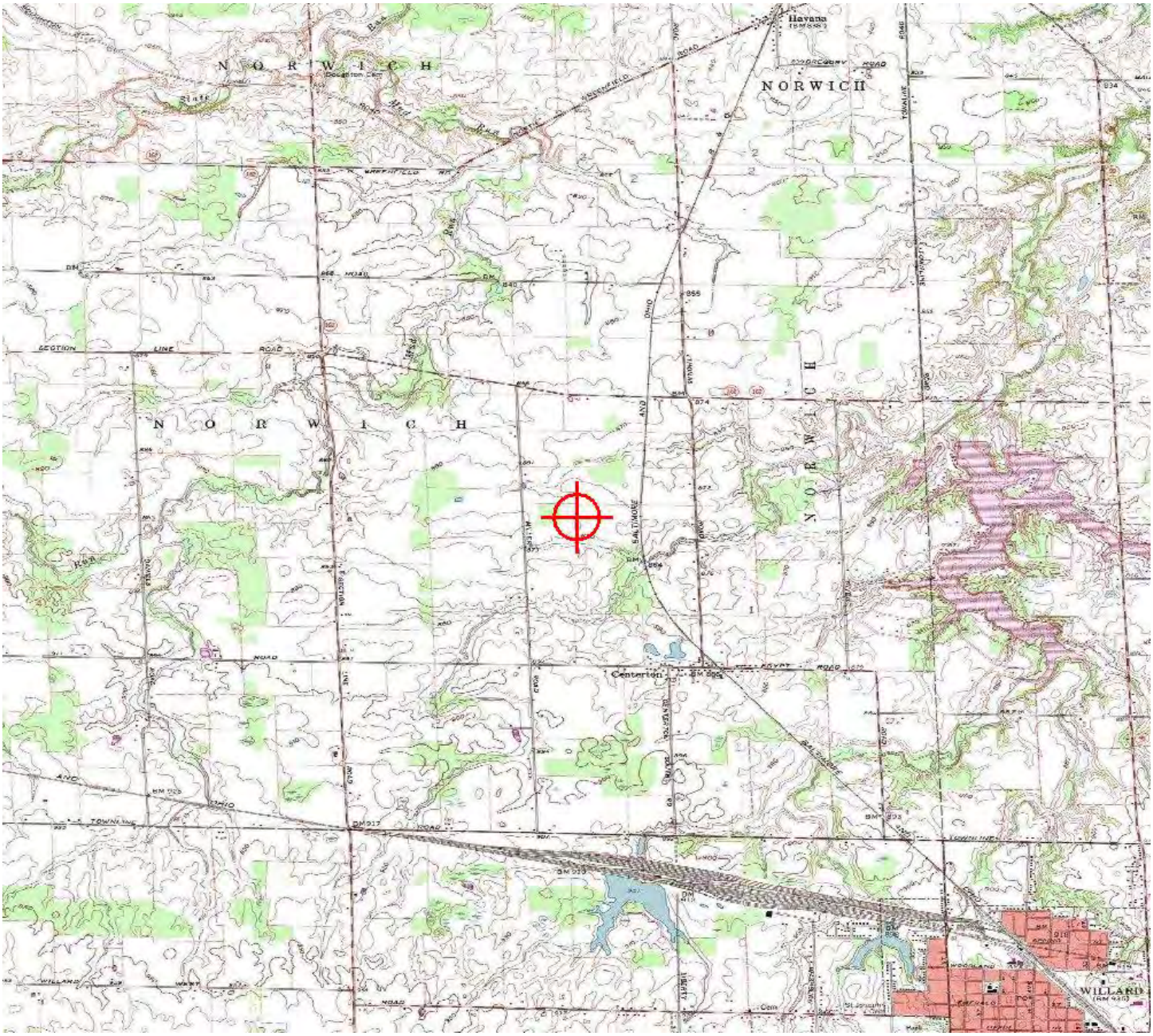
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

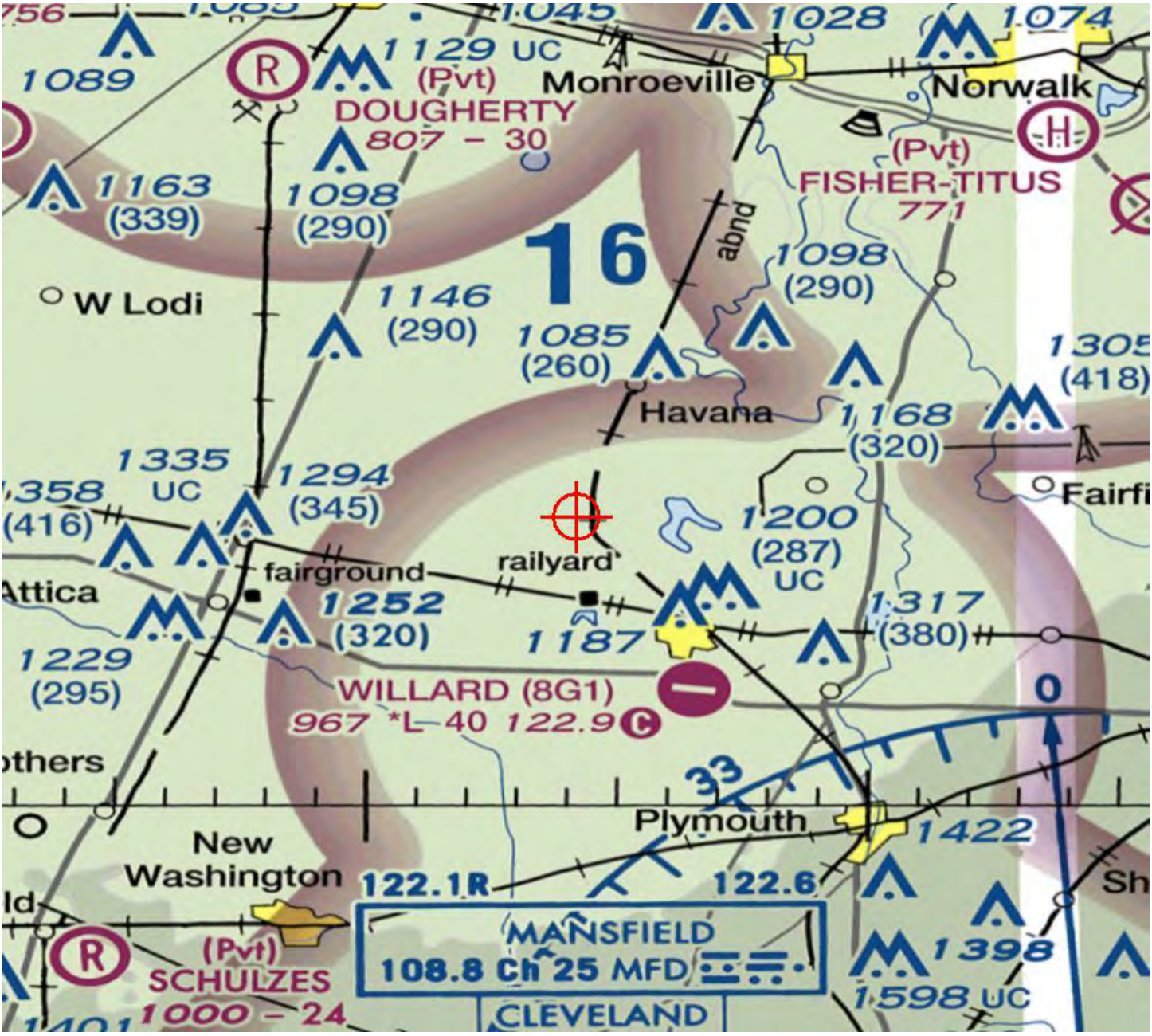
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11968-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11969-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T67
Location:	Bellevue, OH
Latitude:	41-05-39.35N NAD 83
Longitude:	82-46-14.28W
Heights:	876 feet site elevation (SE)
	607 feet above ground level (AGL)
	1483 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11969-OE.

Signature Control No: 392869122-430570700 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

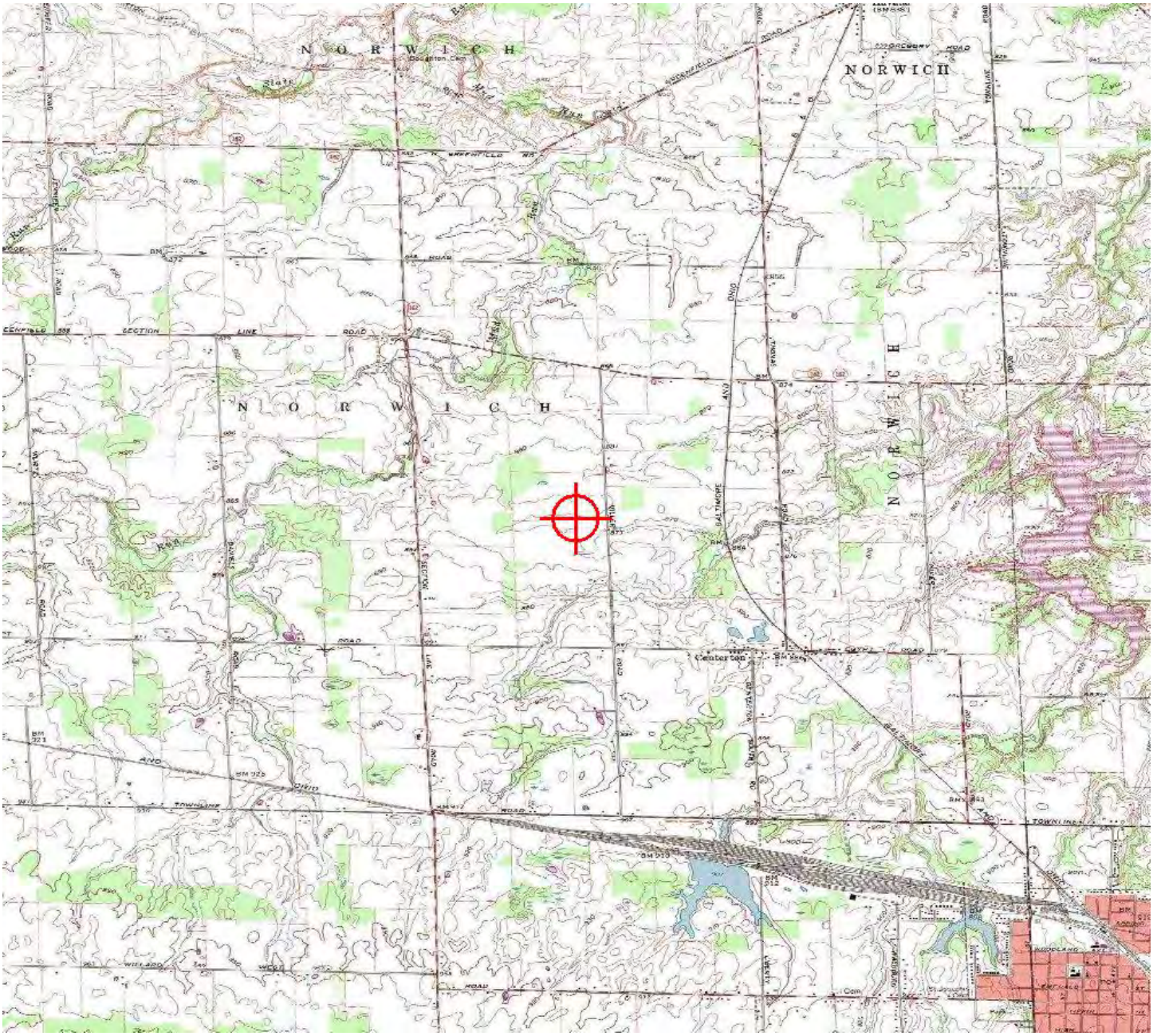
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11969-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11970-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T68
Location:	Bellevue, OH
Latitude:	41-05-33.76N NAD 83
Longitude:	82-46-38.70W
Heights:	882 feet site elevation (SE)
	659 feet above ground level (AGL)
	1541 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11970-OE.

Signature Control No: 392869123-430561954 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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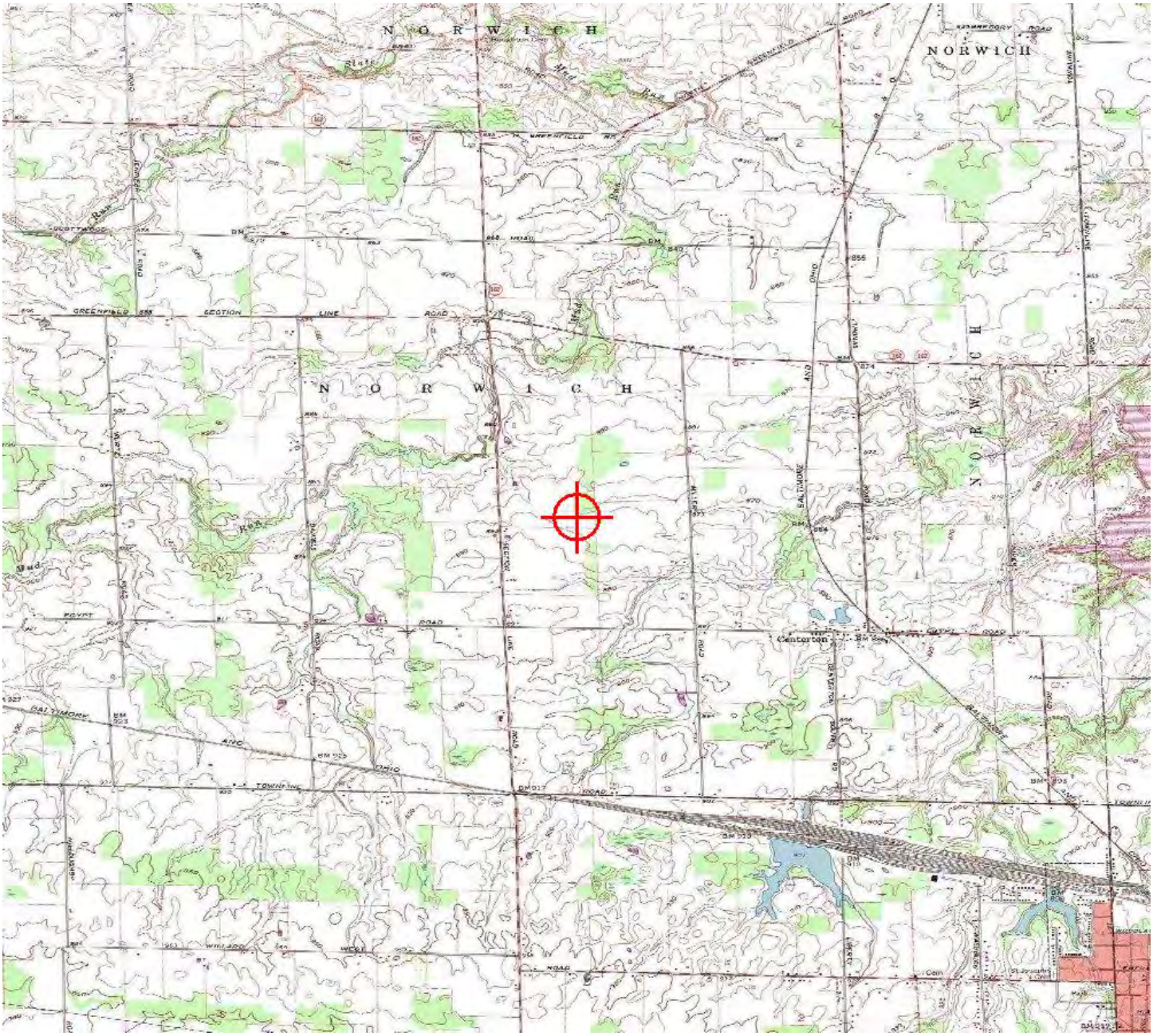
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

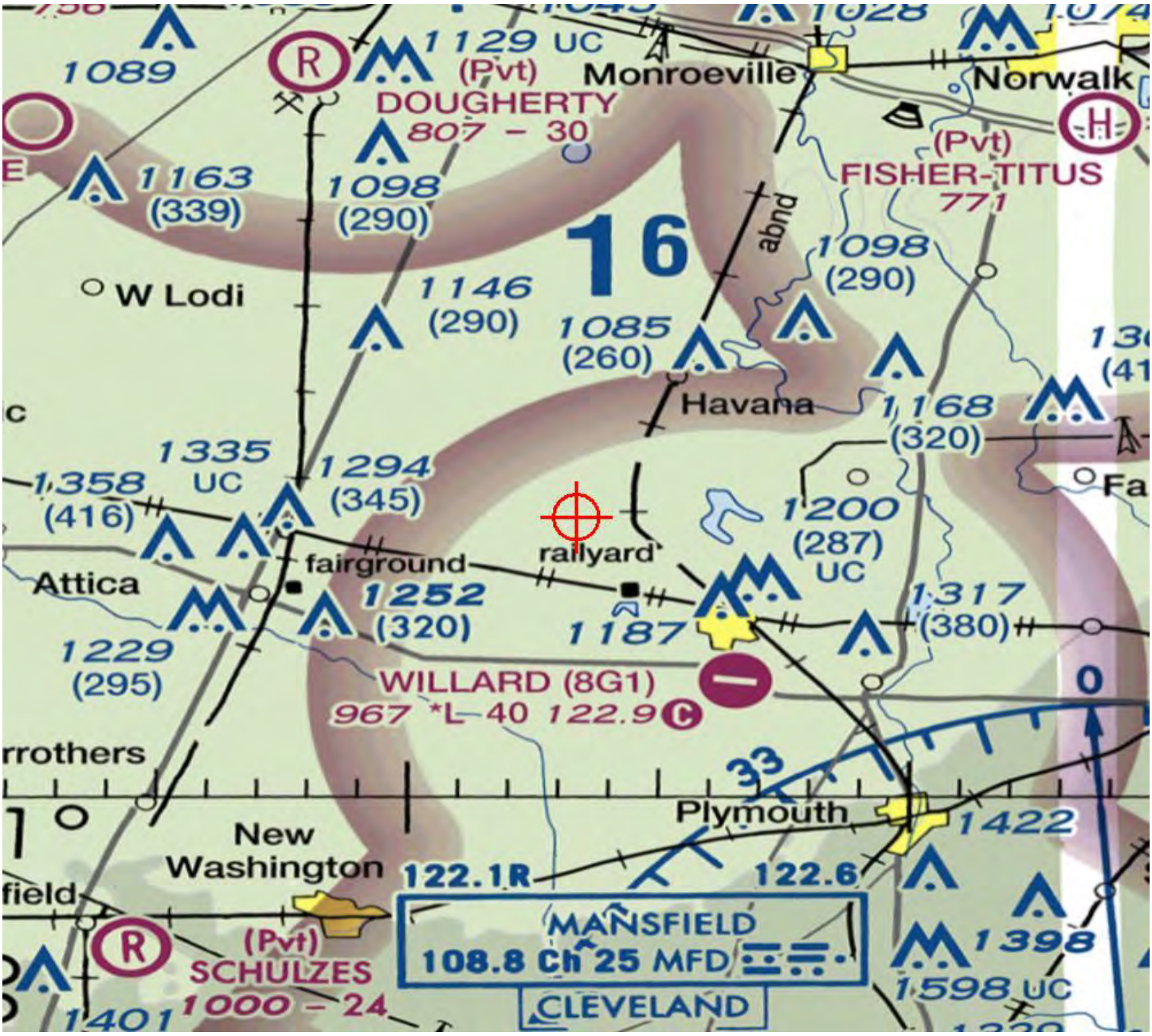
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11970-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11971-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T69
Location:	Bellevue, OH
Latitude:	41-05-30.09N NAD 83
Longitude:	82-47-20.16W
Heights:	888 feet site elevation (SE)
	659 feet above ground level (AGL)
	1547 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11971-OE.

Signature Control No: 392869124-430561946 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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2018-WTE-11967-OE
2018-WTE-11968-OE
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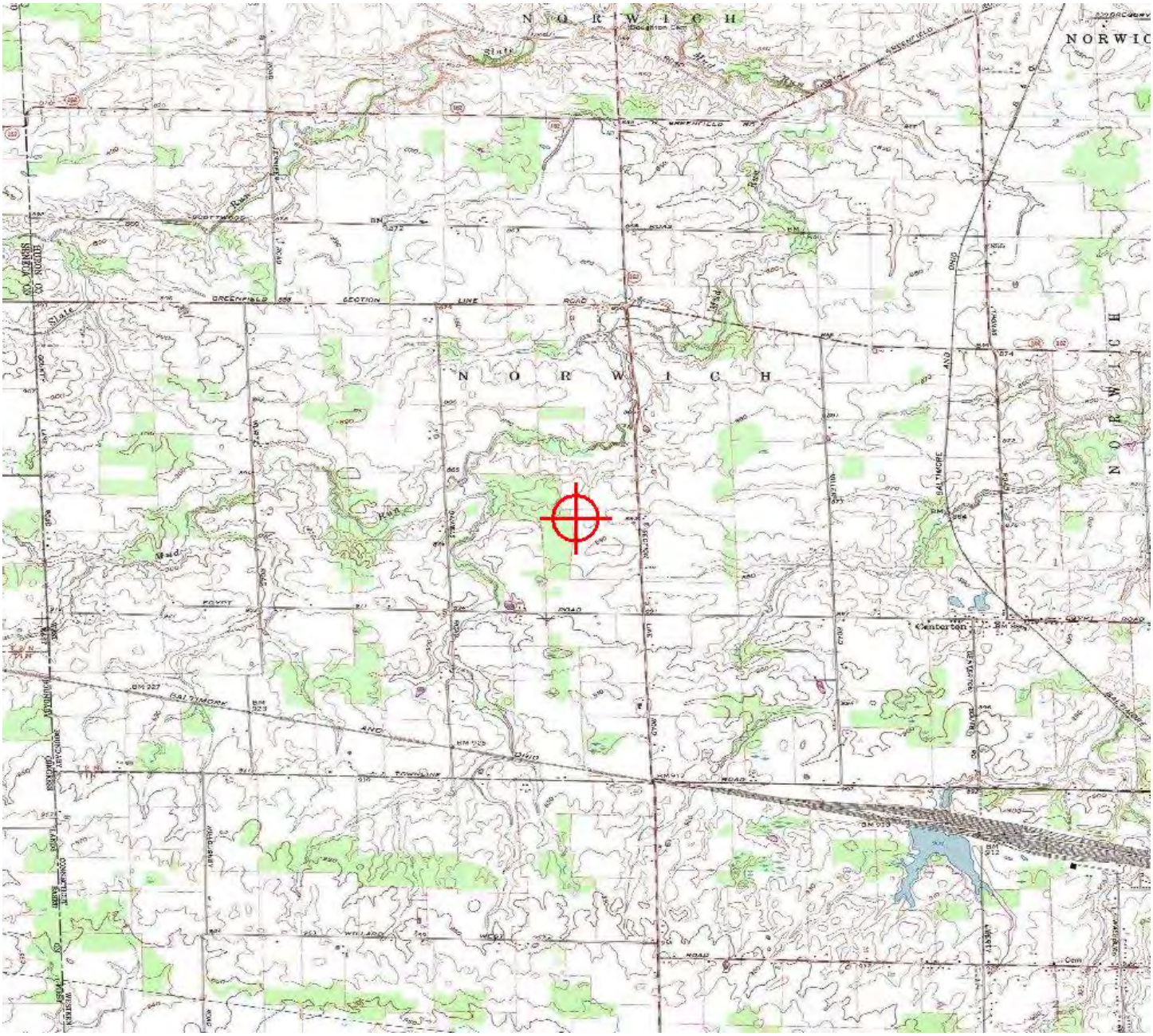
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

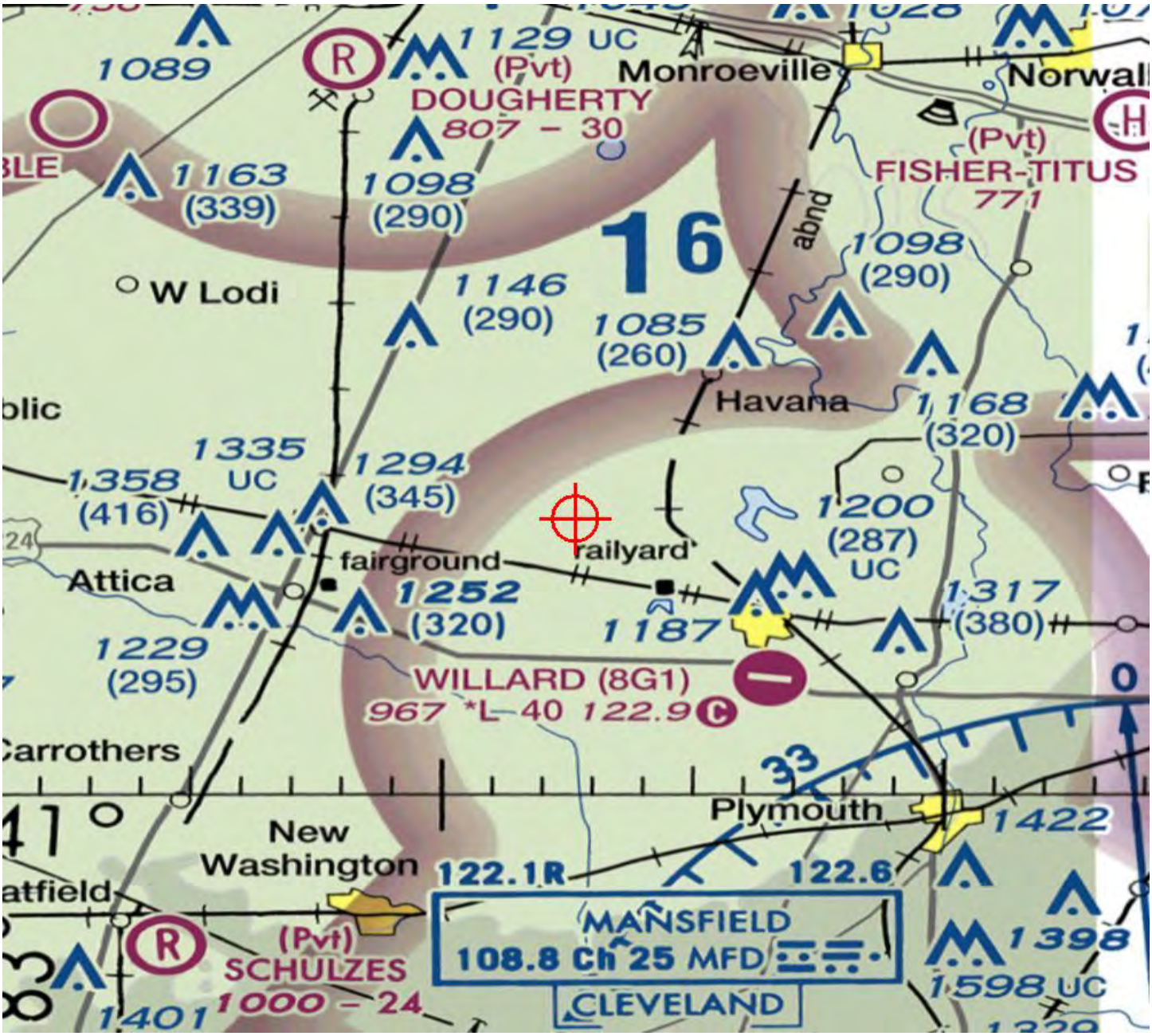
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11971-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11973-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T70
Location:	Bellevue, OH
Latitude:	41-05-17.21N NAD 83
Longitude:	82-49-04.73W
Heights:	904 feet site elevation (SE)
	607 feet above ground level (AGL)
	1511 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11973-OE.

Signature Control No: 392869126-430562006 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

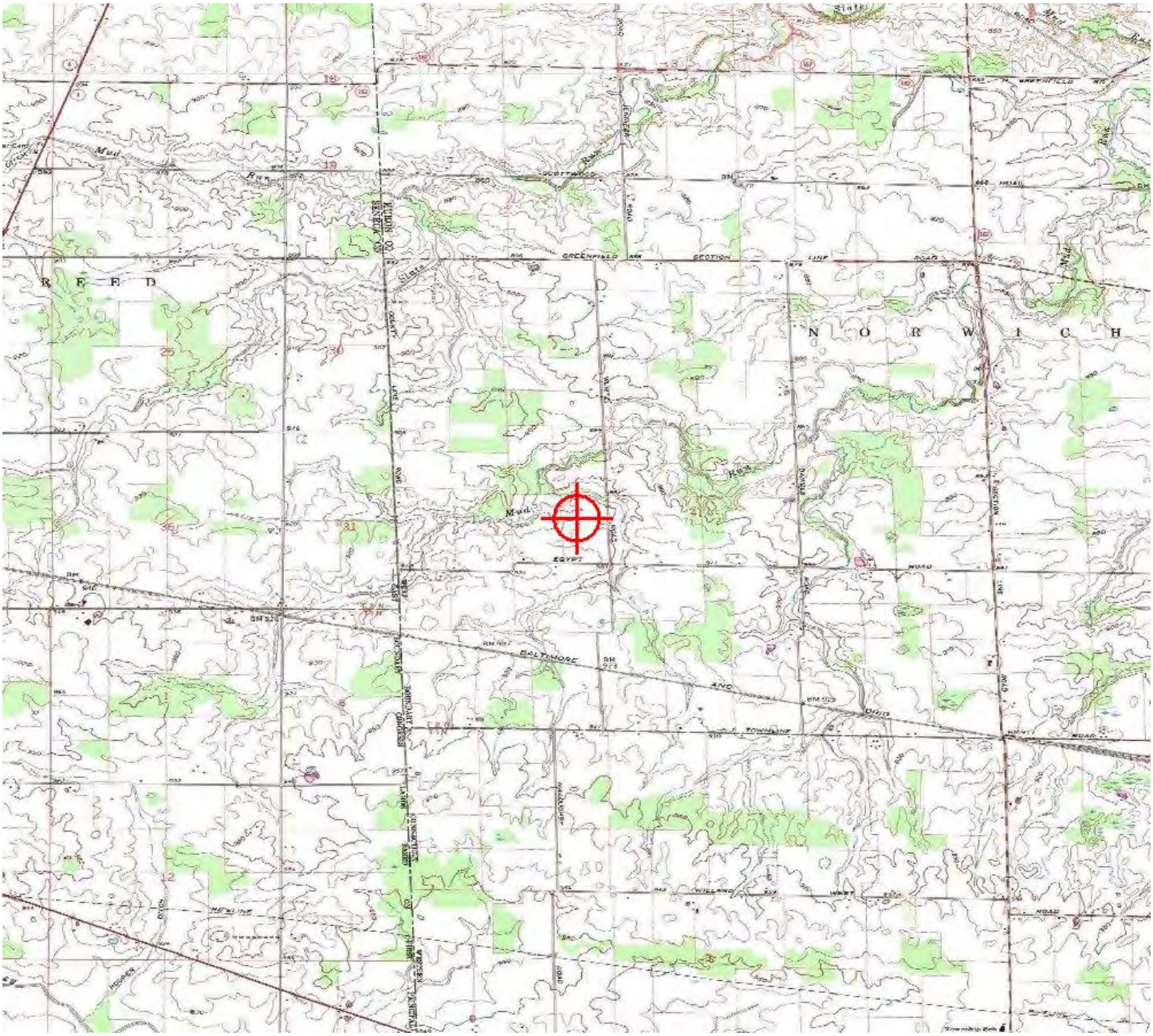
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11973-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11974-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T71
Location:	Bellevue, OH
Latitude:	41-05-13.47N NAD 83
Longitude:	82-46-37.25W
Heights:	882 feet site elevation (SE)
	659 feet above ground level (AGL)
	1541 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11974-OE.

Signature Control No: 392869127-430561953 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

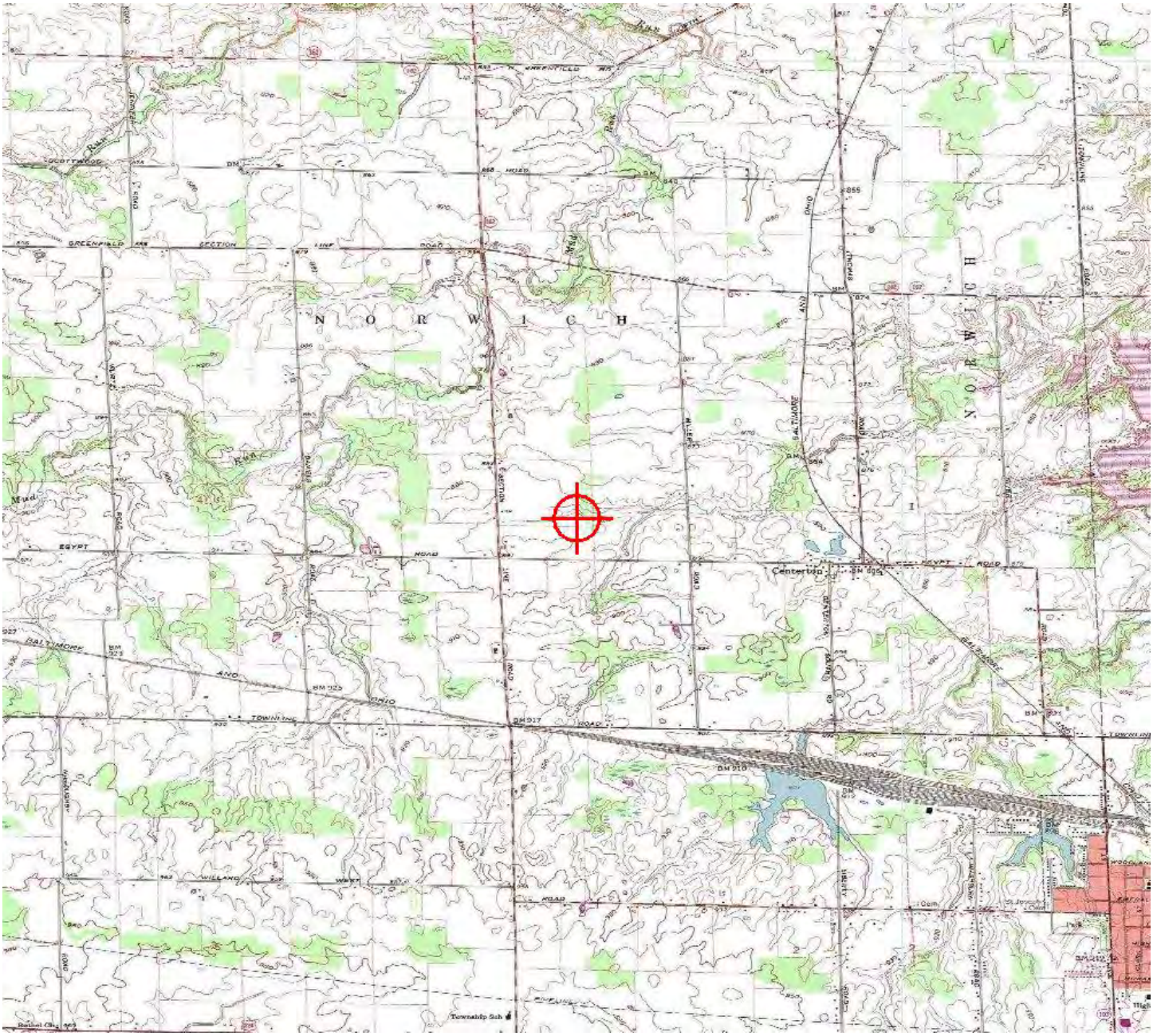
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

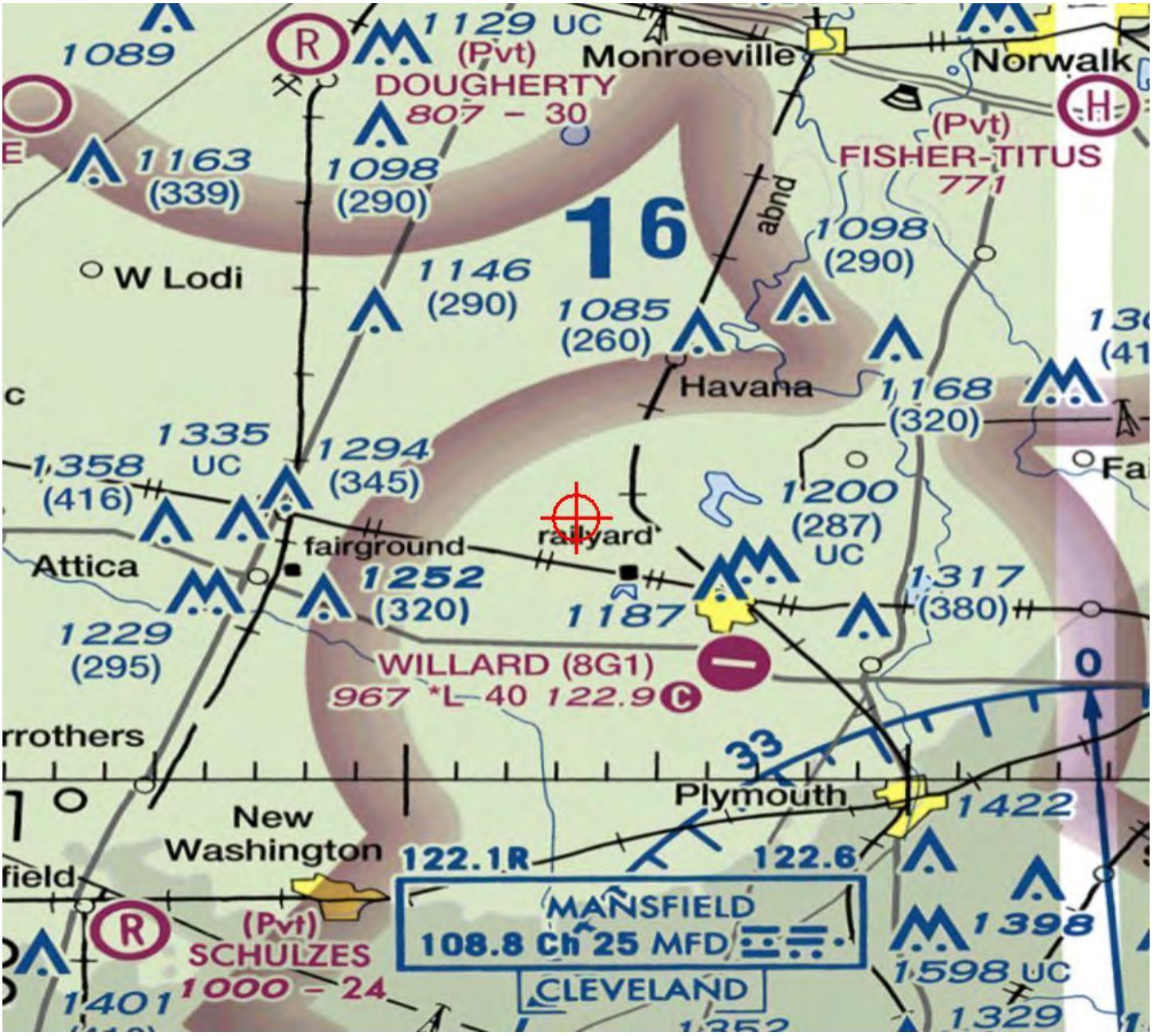
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11974-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11975-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T72
Location:	Bellevue, OH
Latitude:	41-19-02.70N NAD 83
Longitude:	82-47-24.36W
Heights:	718 feet site elevation (SE)
	659 feet above ground level (AGL)
	1377 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11975-OE.

Signature Control No: 392869128-430570704 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

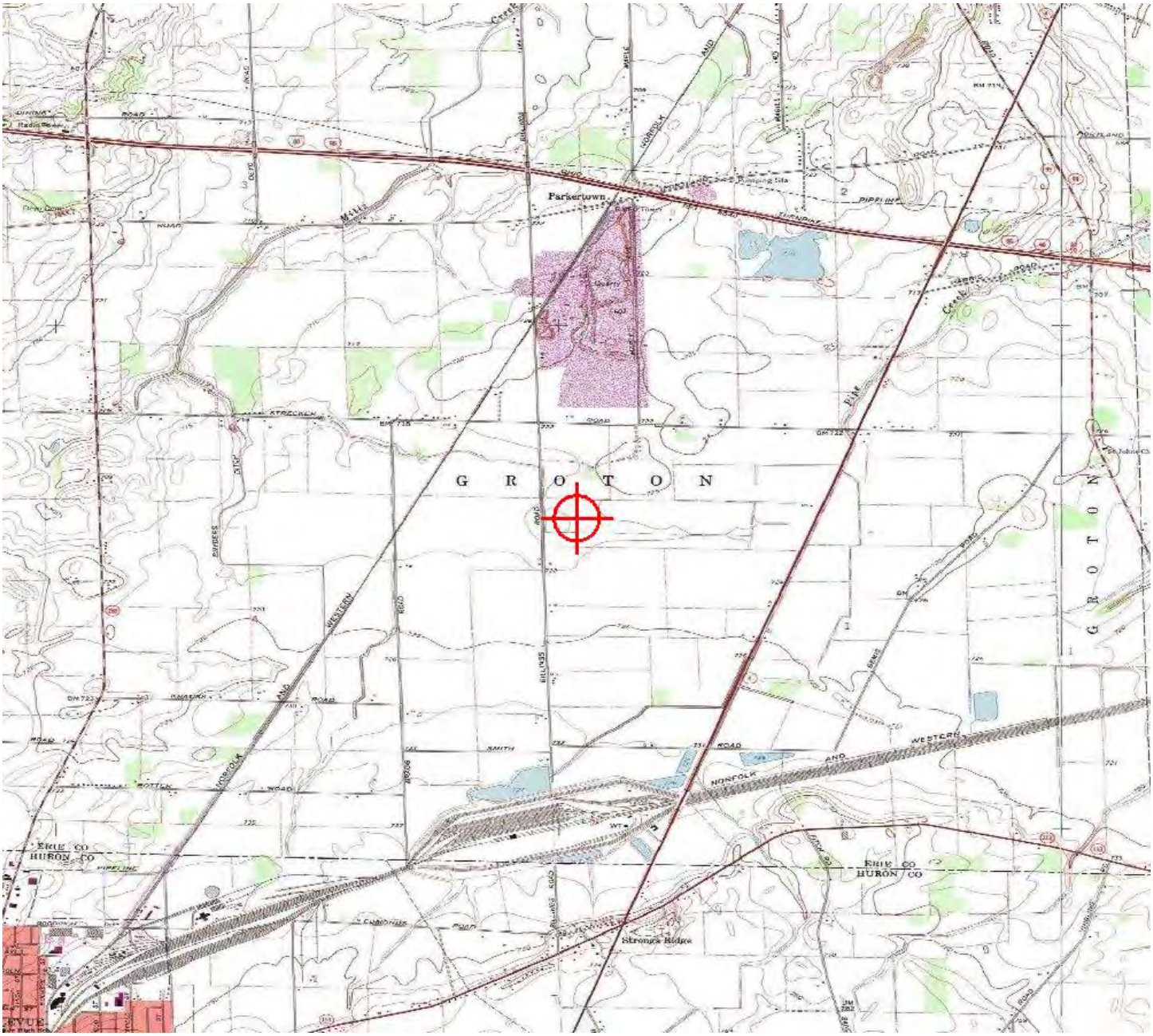
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

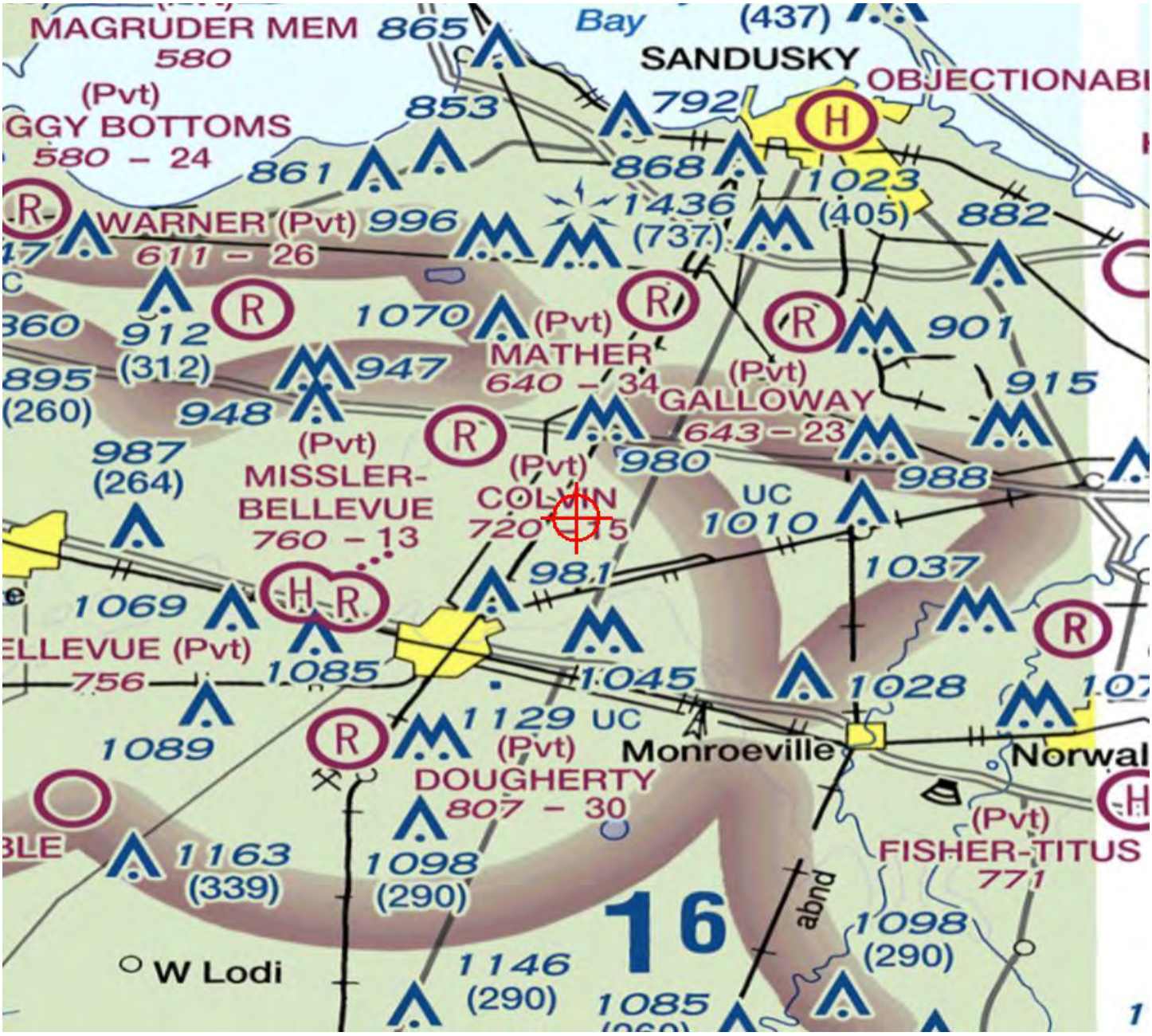
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11975-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11976-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T73
Location:	Bellevue, OH
Latitude:	41-18-35.43N NAD 83
Longitude:	82-48-57.49W
Heights:	722 feet site elevation (SE)
	659 feet above ground level (AGL)
	1381 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11976-OE.

Signature Control No: 392869129-430570705 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

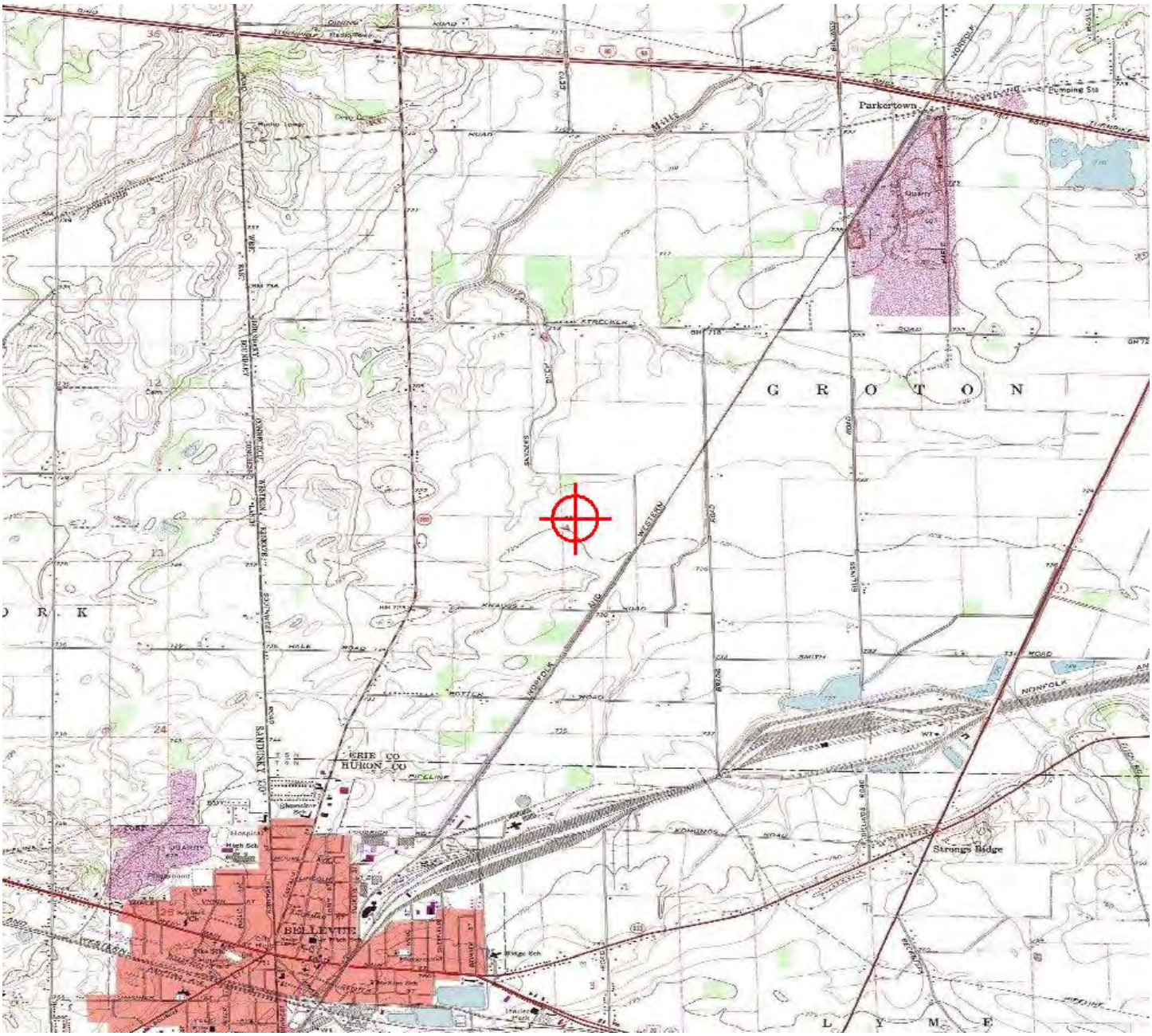
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

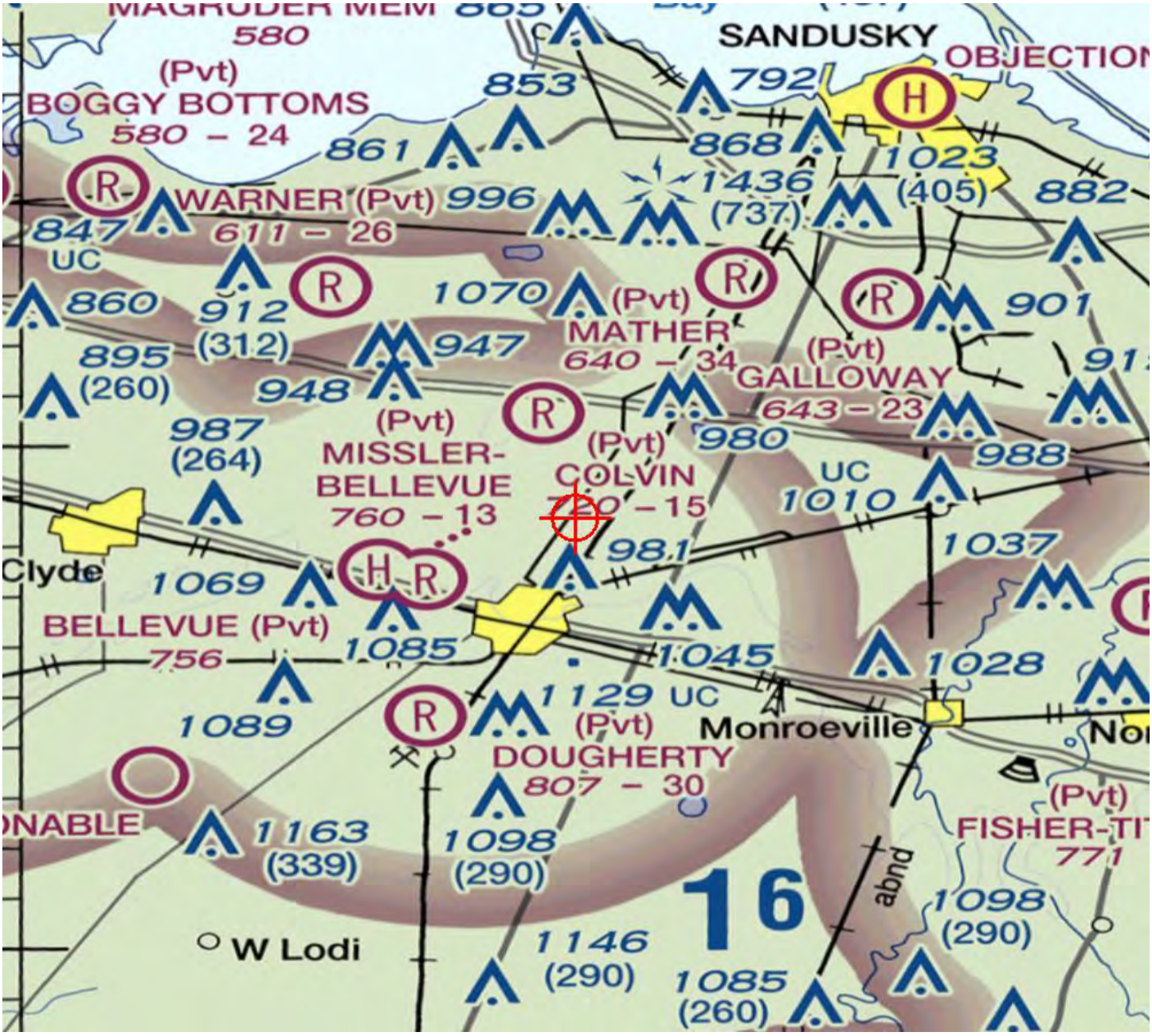
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11976-OE



Sectional Map for ASN 2018-WTE-11976-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11977-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T74
Location:	Bellevue, OH
Latitude:	41-18-25.38N NAD 83
Longitude:	82-49-04.39W
Heights:	720 feet site elevation (SE)
	659 feet above ground level (AGL)
	1379 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11977-OE.

Signature Control No: 392869130-430570710 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

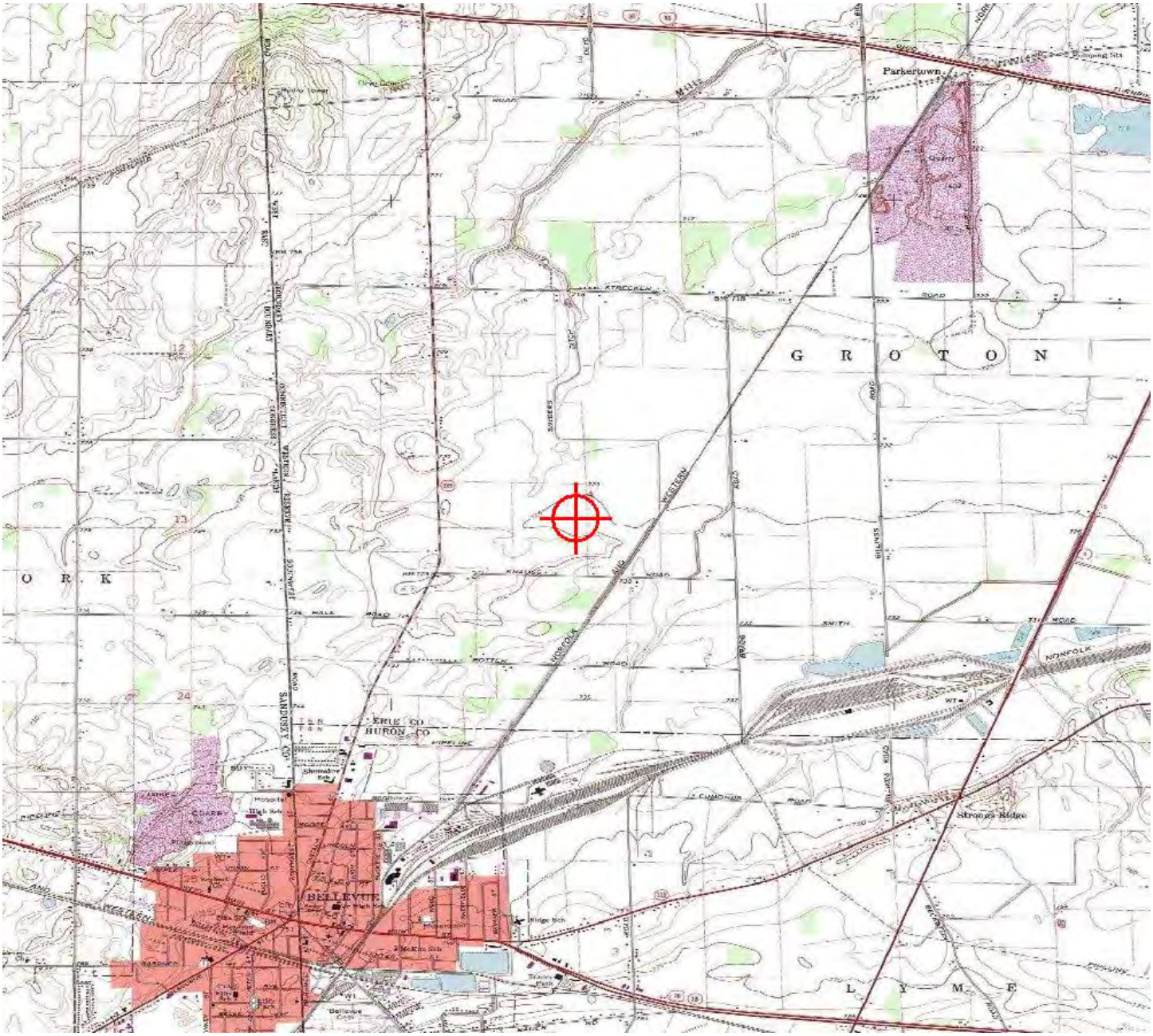
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

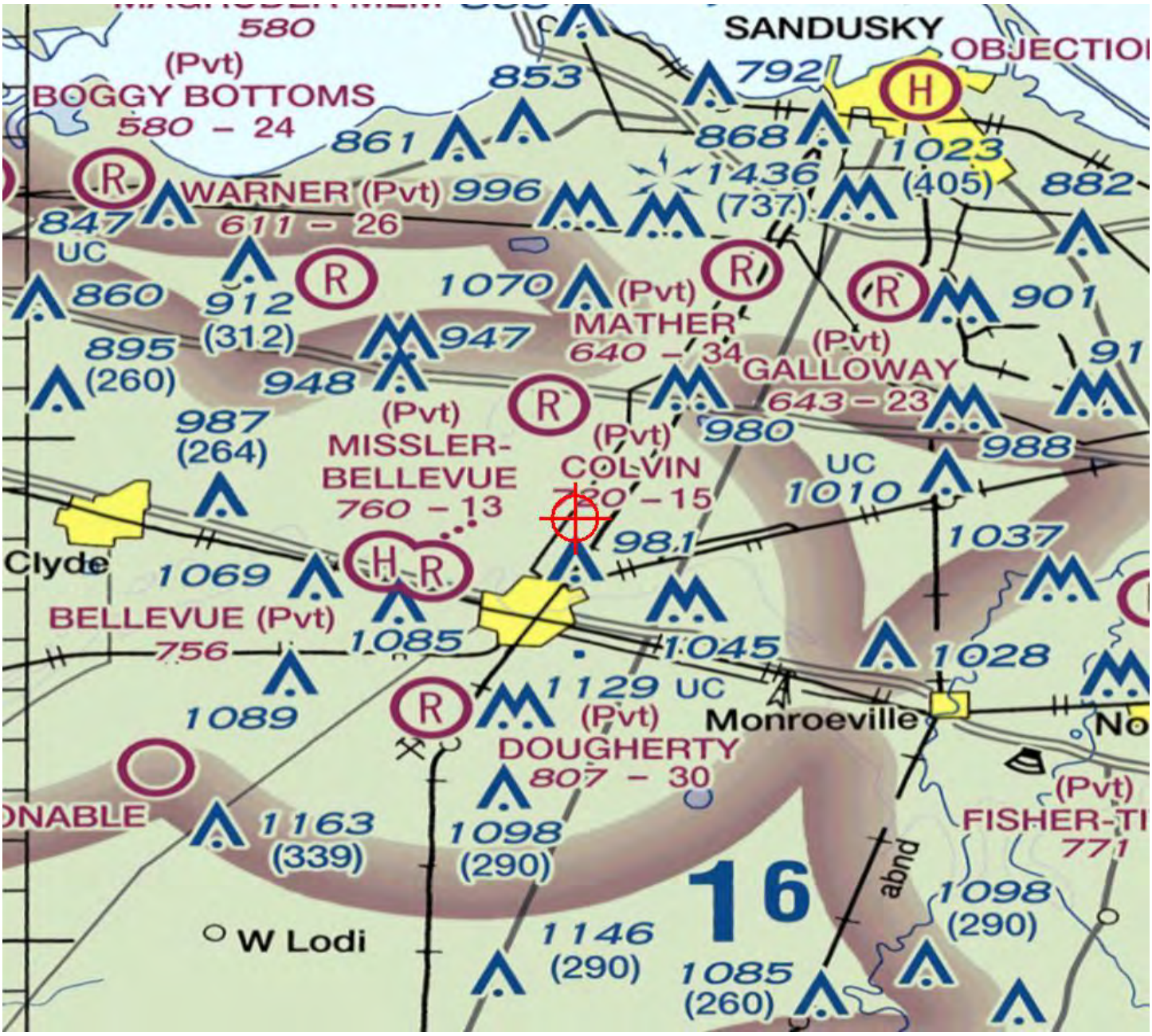
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11977-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11978-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T75
Location:	Bellevue, OH
Latitude:	41-15-37.82N NAD 83
Longitude:	82-48-11.21W
Heights:	780 feet site elevation (SE)
	659 feet above ground level (AGL)
	1439 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11978-OE.

Signature Control No: 392869131-430570714 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

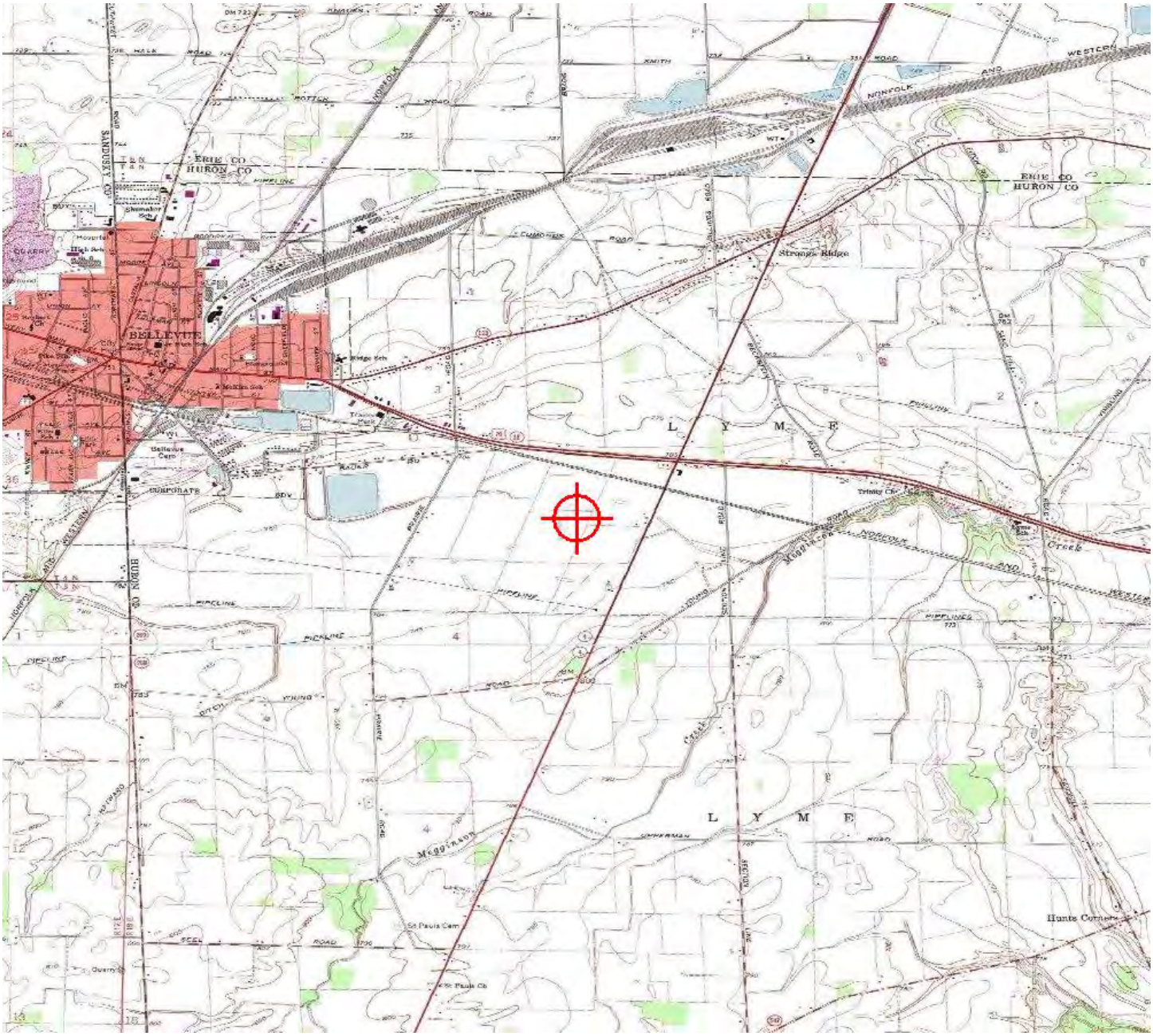
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

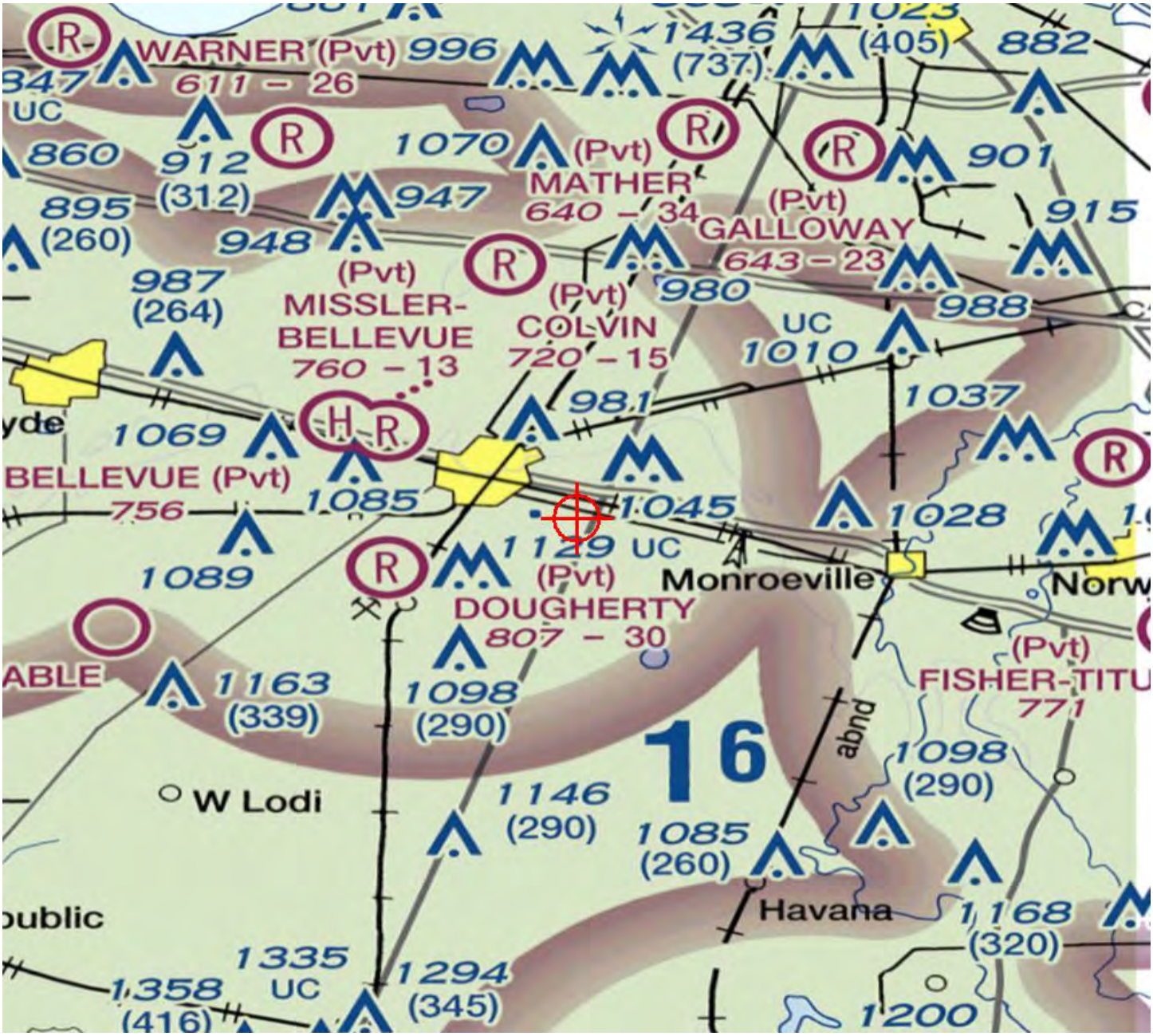
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11978-OE



Sectional Map for ASN 2018-WTE-11978-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11980-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T77
Location:	Bellevue, OH
Latitude:	41-11-50.81N NAD 83
Longitude:	82-46-34.22W
Heights:	788 feet site elevation (SE)
	659 feet above ground level (AGL)
	1447 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11980-OE.

Signature Control No: 392869133-430570716 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

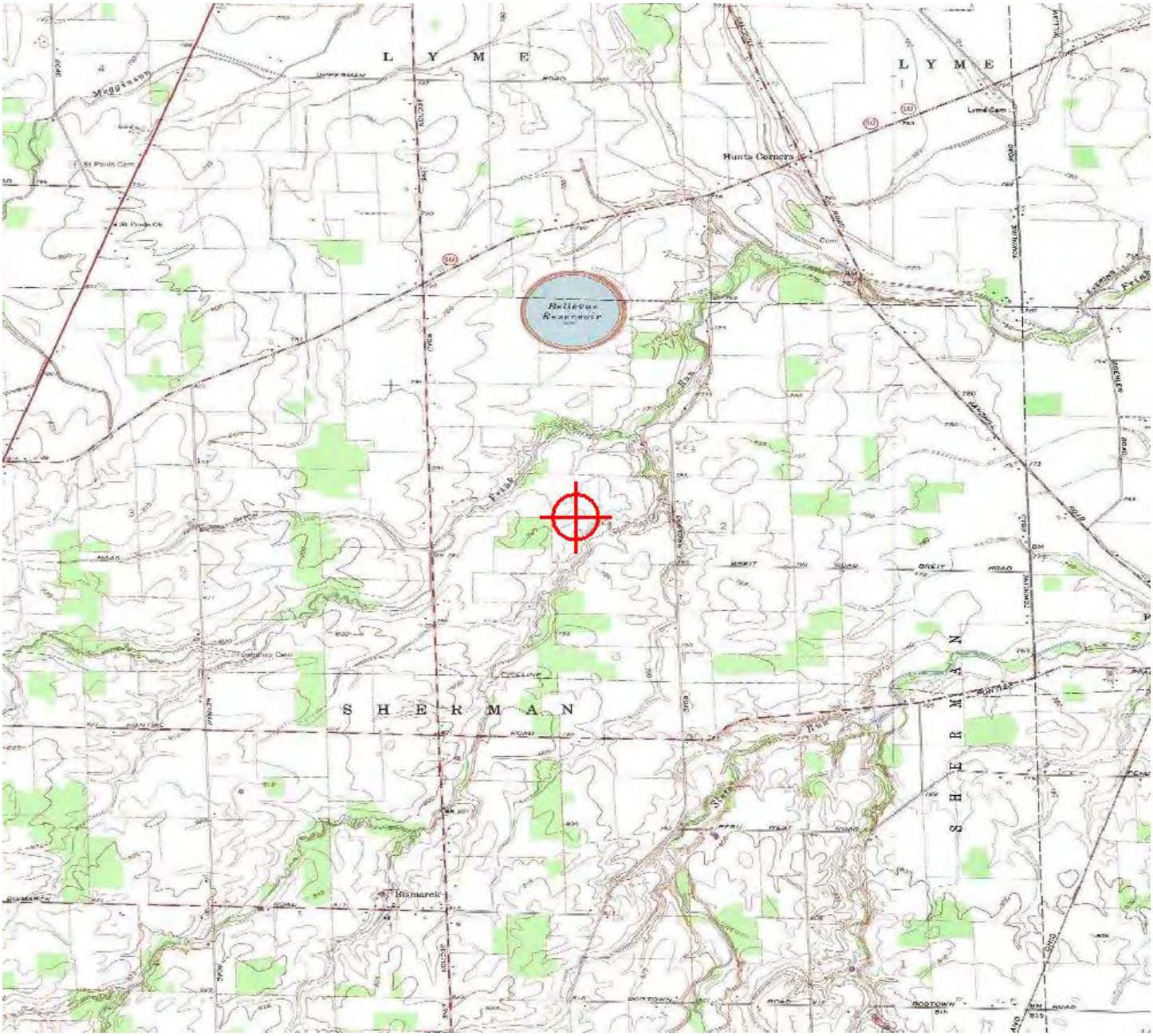
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

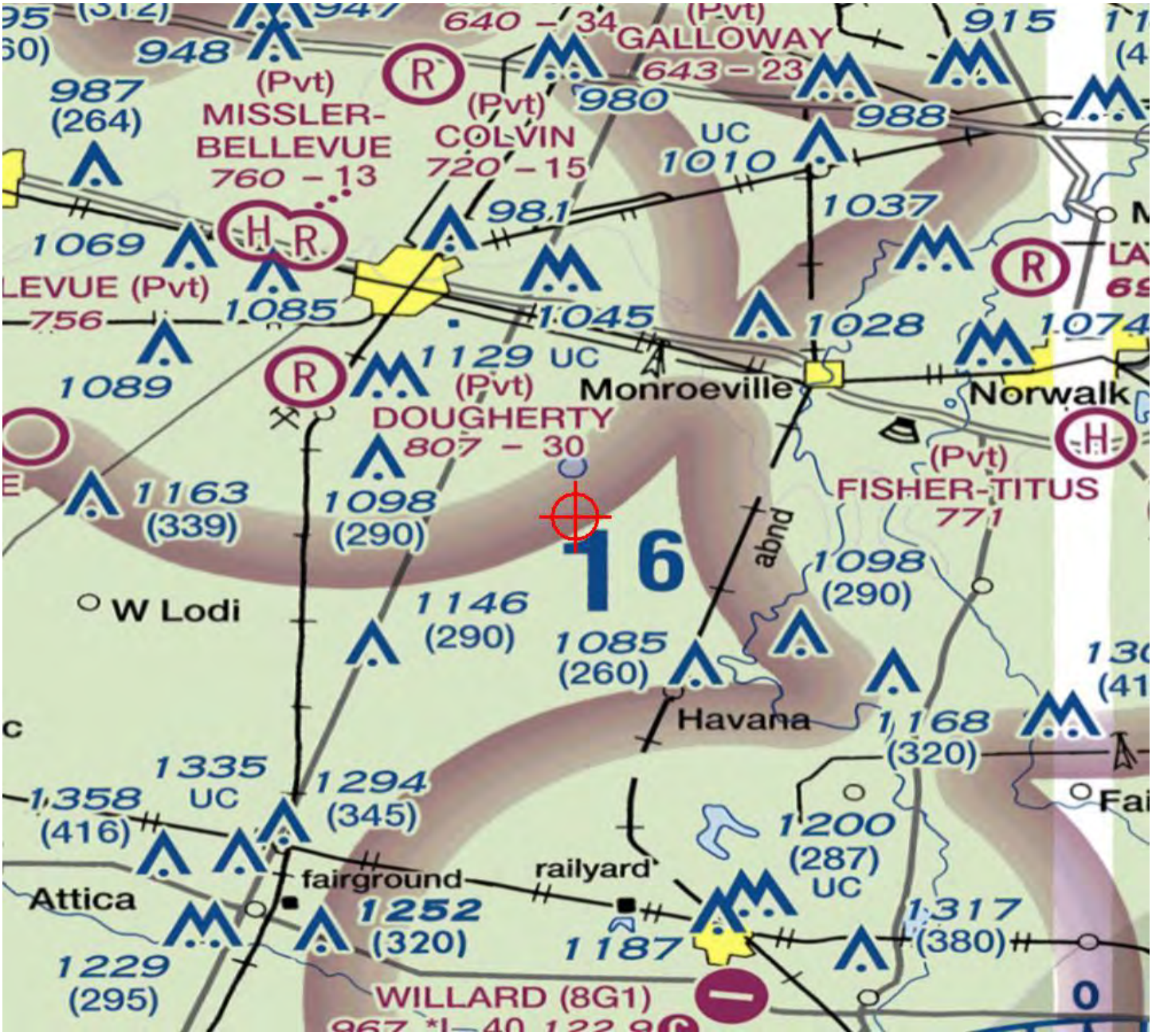
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11980-OE




948
(Pvt)
MISSLER-
BELLEVUE
760 – 13
640 – 34
(Pvt)
COLVIN
720 – 15
(Pvt)
GALLOWAY
643 – 23
980
915
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988
UC
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1074
1089
1129 UC
(Pvt)
DOUGHERTY
807 – 30
Monroeville
Norwalk
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FISHER-TITUS
771
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1085
(260)
Havana
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(320)
1335
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1358
(416)
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1200
(287)
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fairground
railyard
Attica
1252
(320)
1187
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(380)
1229
(295)
WILLARD (8G1)

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11981-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T78
Location:	Bellevue, OH
Latitude:	41-08-01.35N NAD 83
Longitude:	82-49-23.51W
Heights:	860 feet site elevation (SE)
	659 feet above ground level (AGL)
	1519 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11981-OE.

Signature Control No: 392869134-430562007 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

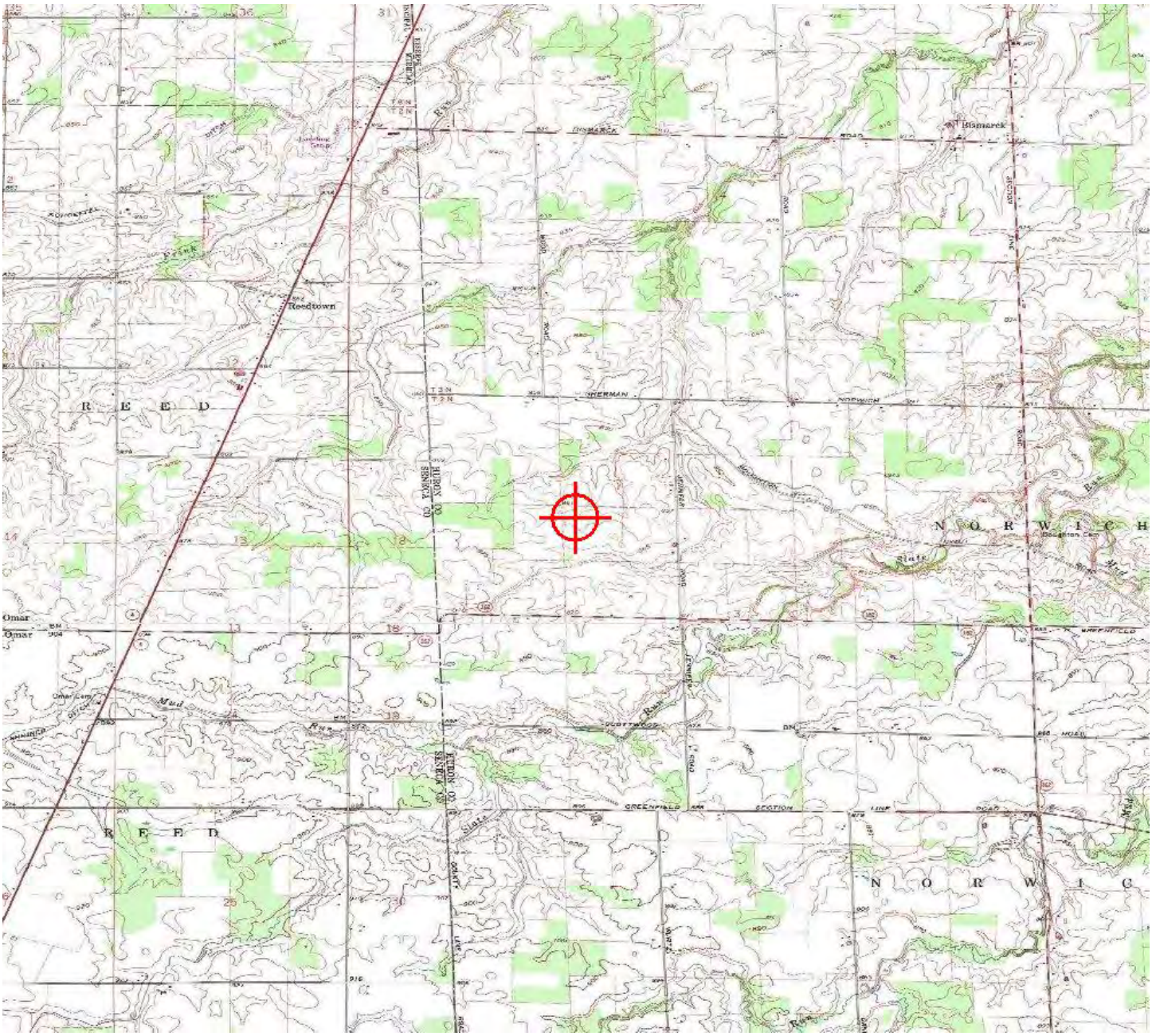
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

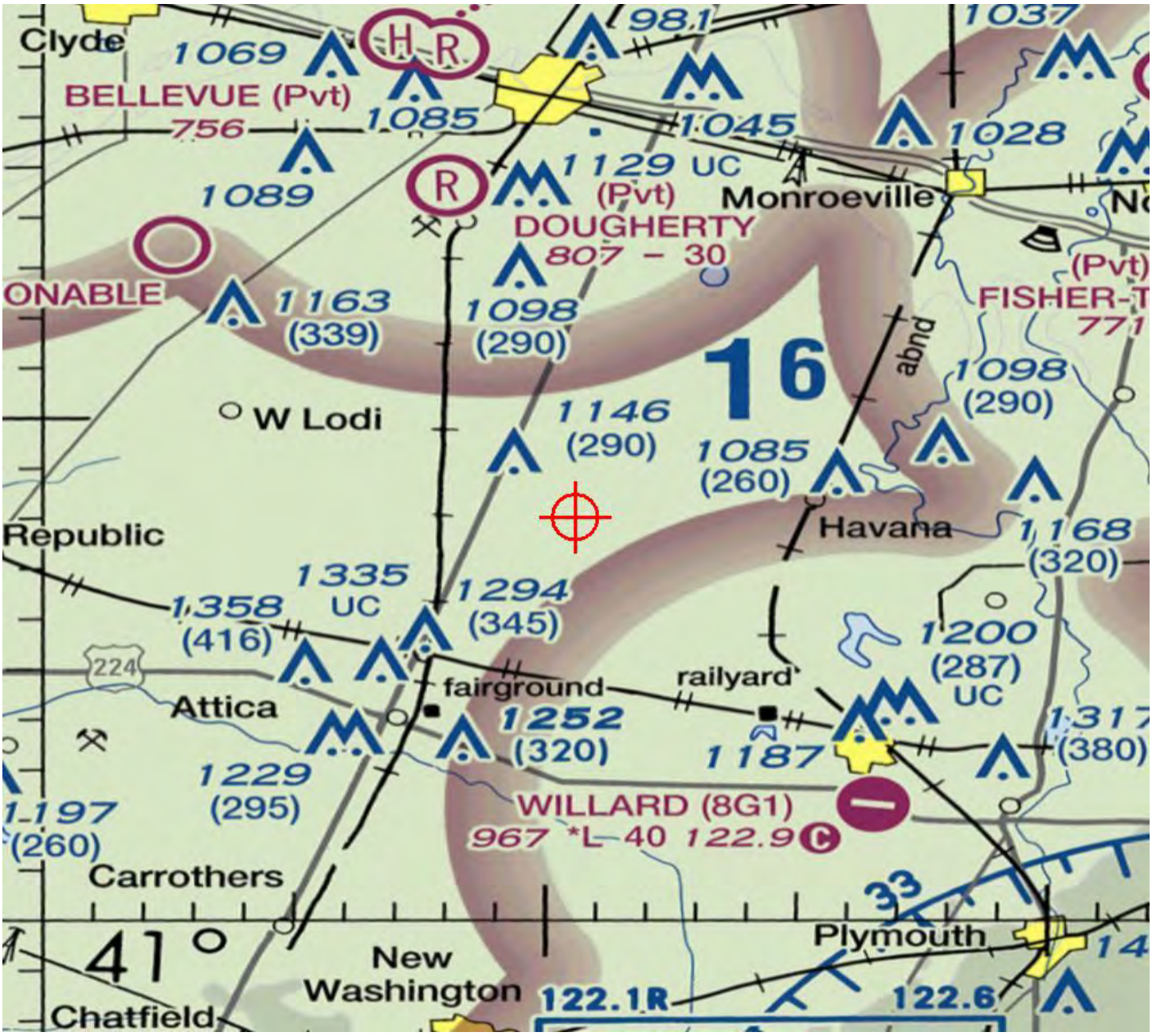
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11981-OE

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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11982-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T79
Location:	Bellevue, OH
Latitude:	41-06-39.21N NAD 83
Longitude:	82-44-24.98W
Heights:	858 feet site elevation (SE)
	659 feet above ground level (AGL)
	1517 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11982-OE.

Signature Control No: 392869135-430561974 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
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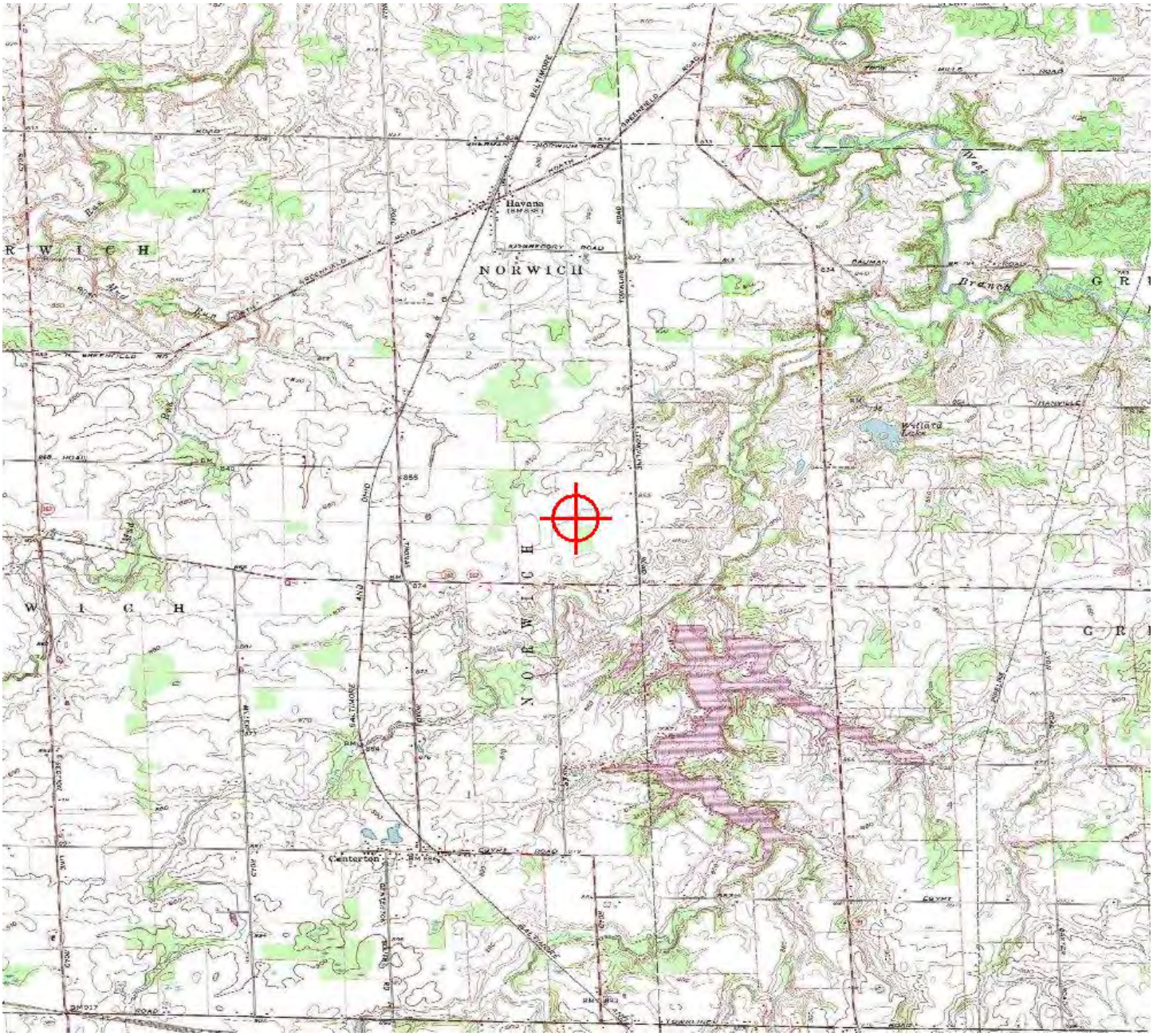
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

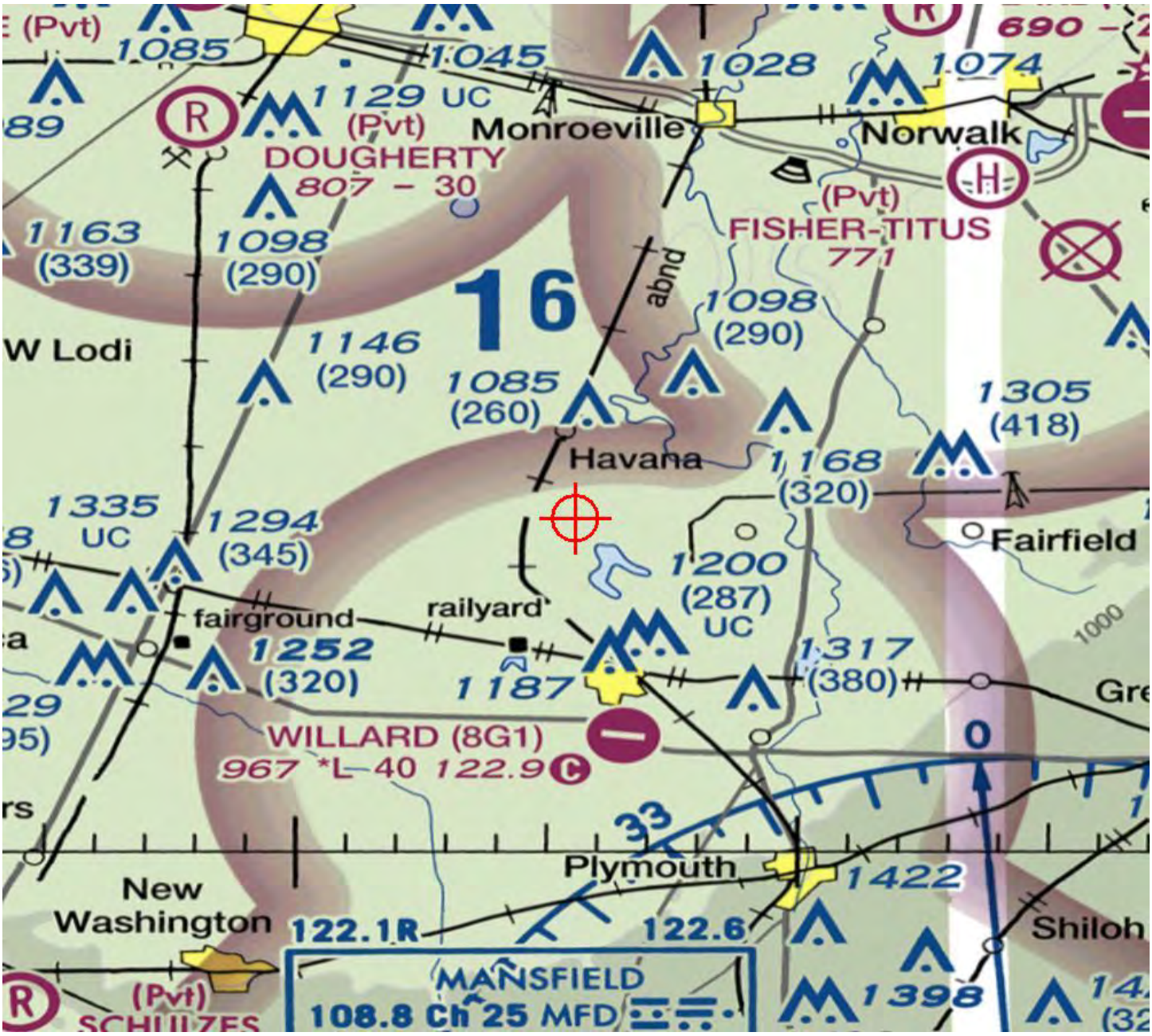
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11982-OE

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Mail Processing Center
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Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11984-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T80
Location:	Bellevue, OH
Latitude:	41-03-54.95N NAD 83
Longitude:	82-49-29.80W
Heights:	956 feet site elevation (SE)
	659 feet above ground level (AGL)
	1615 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11984-OE.

Signature Control No: 392869137-430561975 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

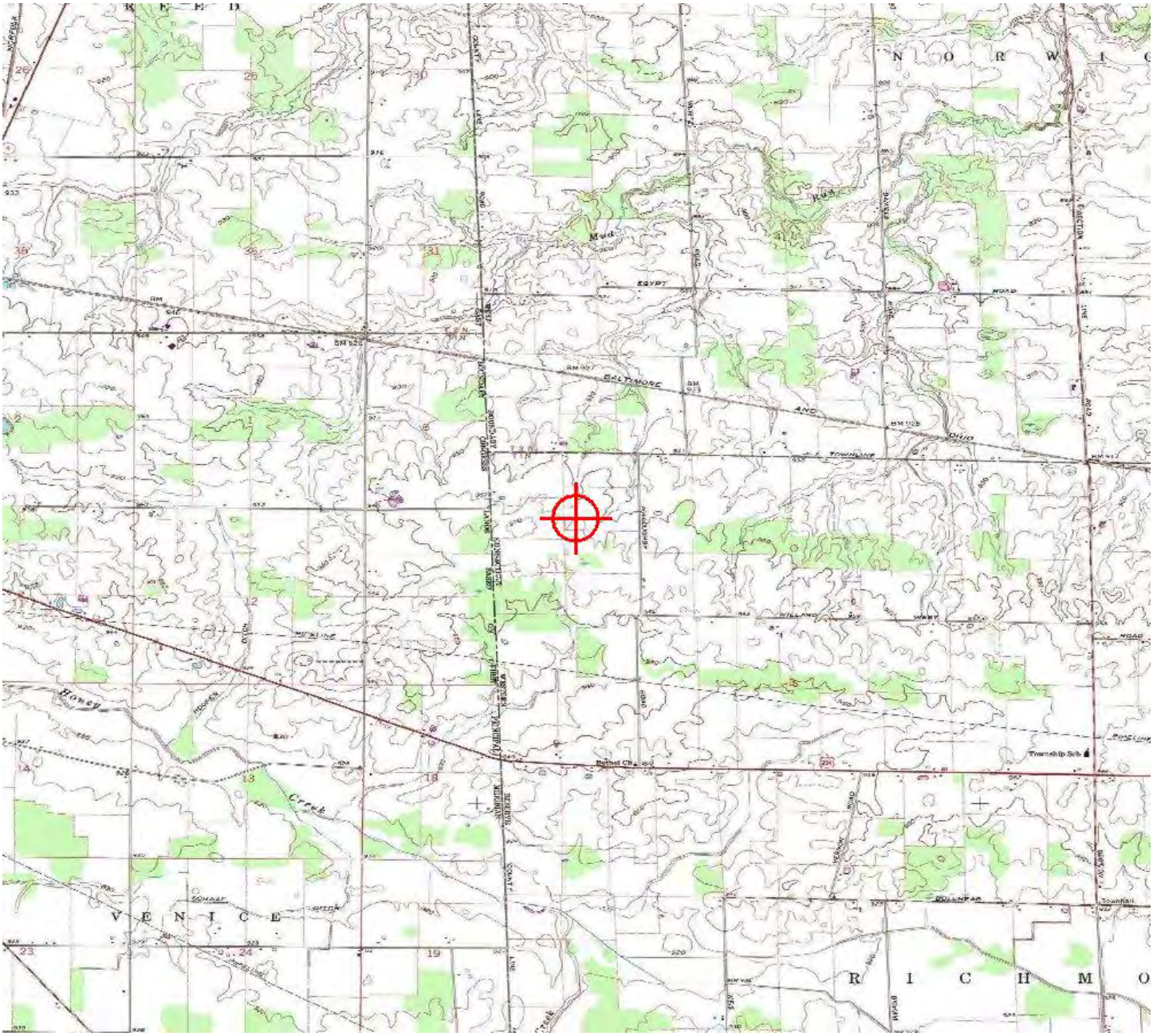
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11984-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11985-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T81
Location:	Bellevue, OH
Latitude:	41-03-30.60N NAD 83
Longitude:	82-49-29.10W
Heights:	958 feet site elevation (SE)
	659 feet above ground level (AGL)
	1617 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11985-OE.

Signature Control No: 392869138-430561945 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

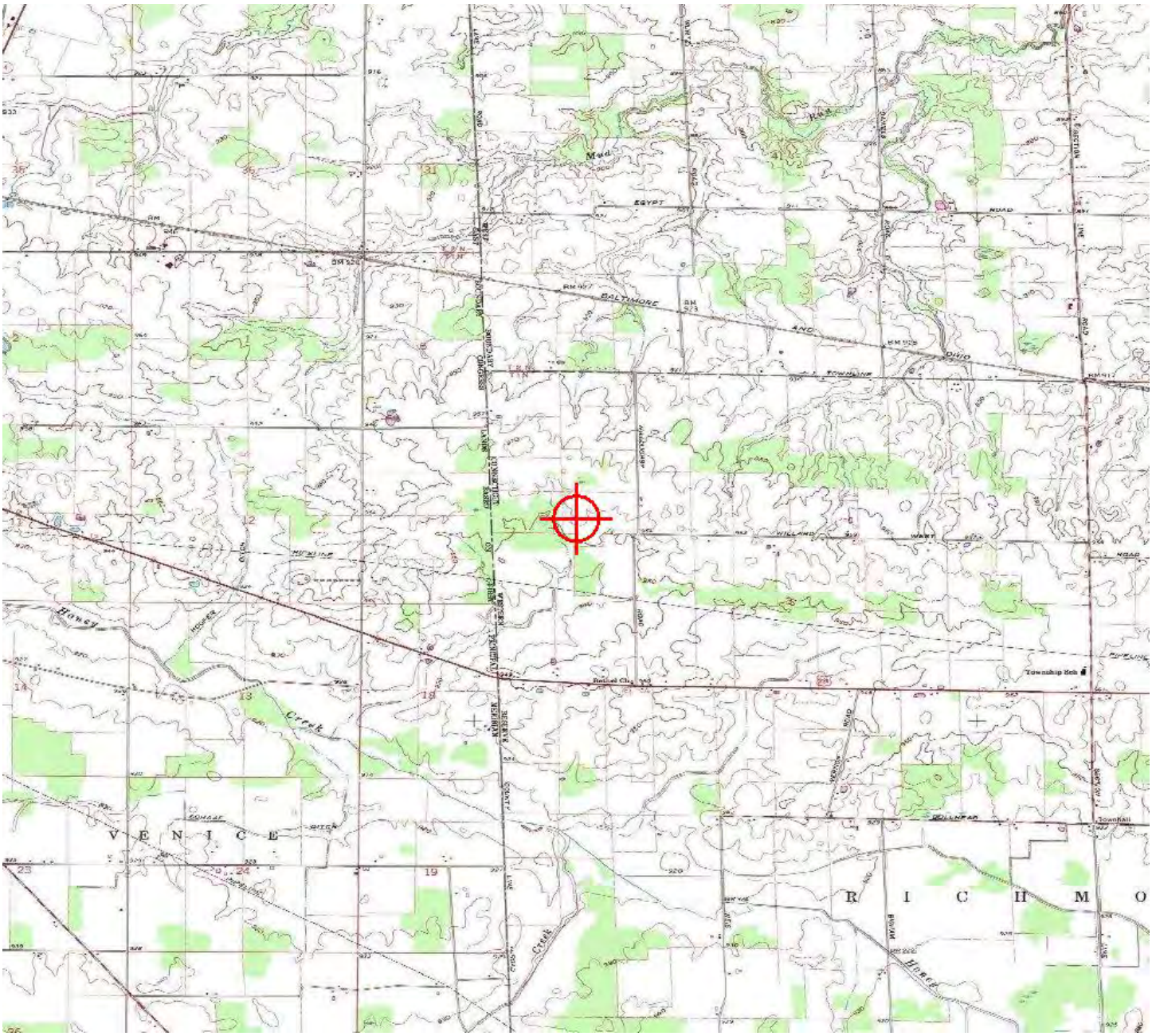
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11985-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11986-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T82
Location:	Bellevue, OH
Latitude:	41-02-58.70N NAD 83
Longitude:	82-49-37.70W
Heights:	932 feet site elevation (SE)
	607 feet above ground level (AGL)
	1539 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11986-OE.

Signature Control No: 392869139-430562201 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

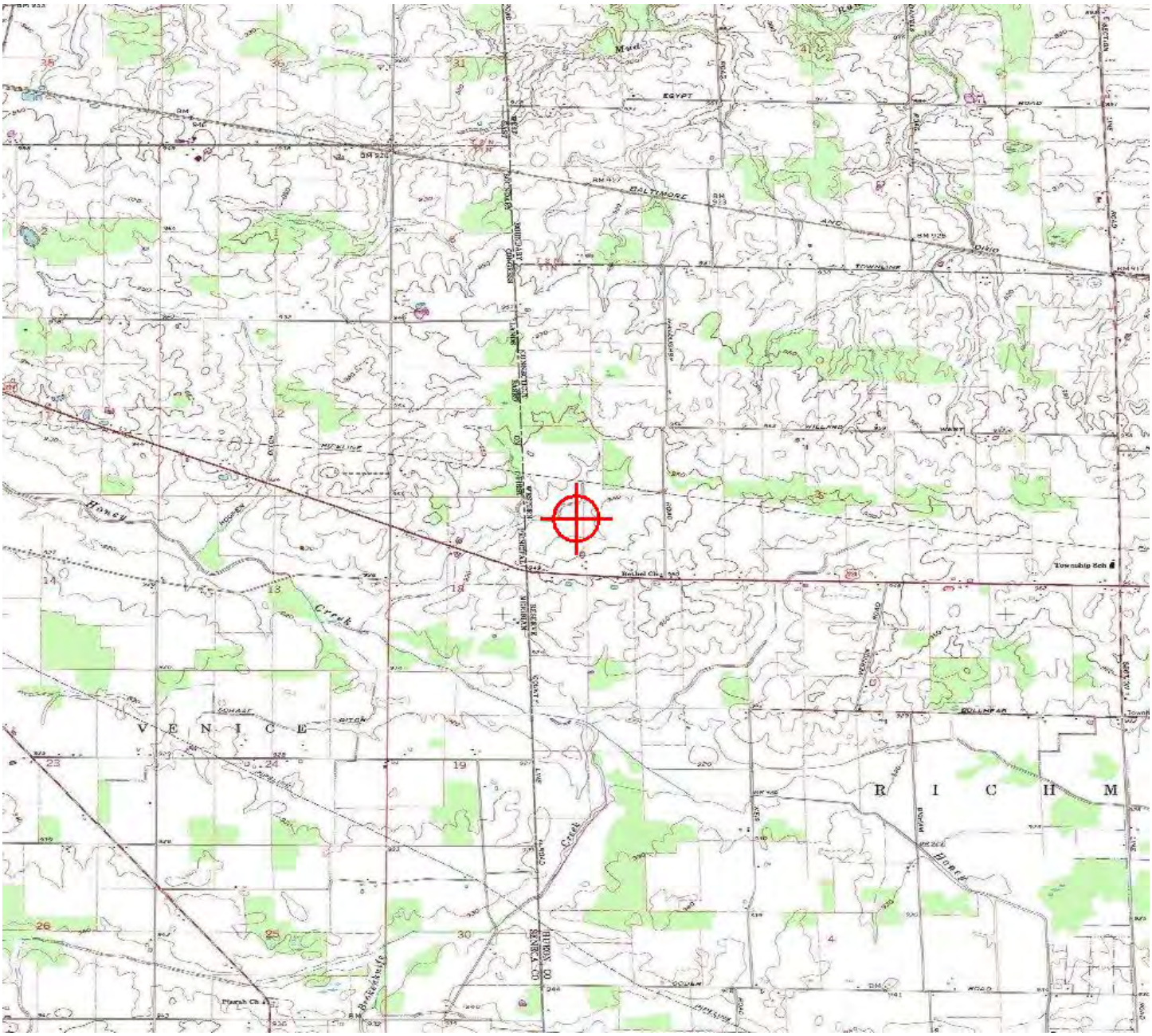
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11986-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11987-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T83
Location:	Bellevue, OH
Latitude:	41-02-55.86N NAD 83
Longitude:	82-49-23.69W
Heights:	945 feet site elevation (SE)
	659 feet above ground level (AGL)
	1604 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 56 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/21/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11987-OE.

Signature Control No: 392869140-430559833 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

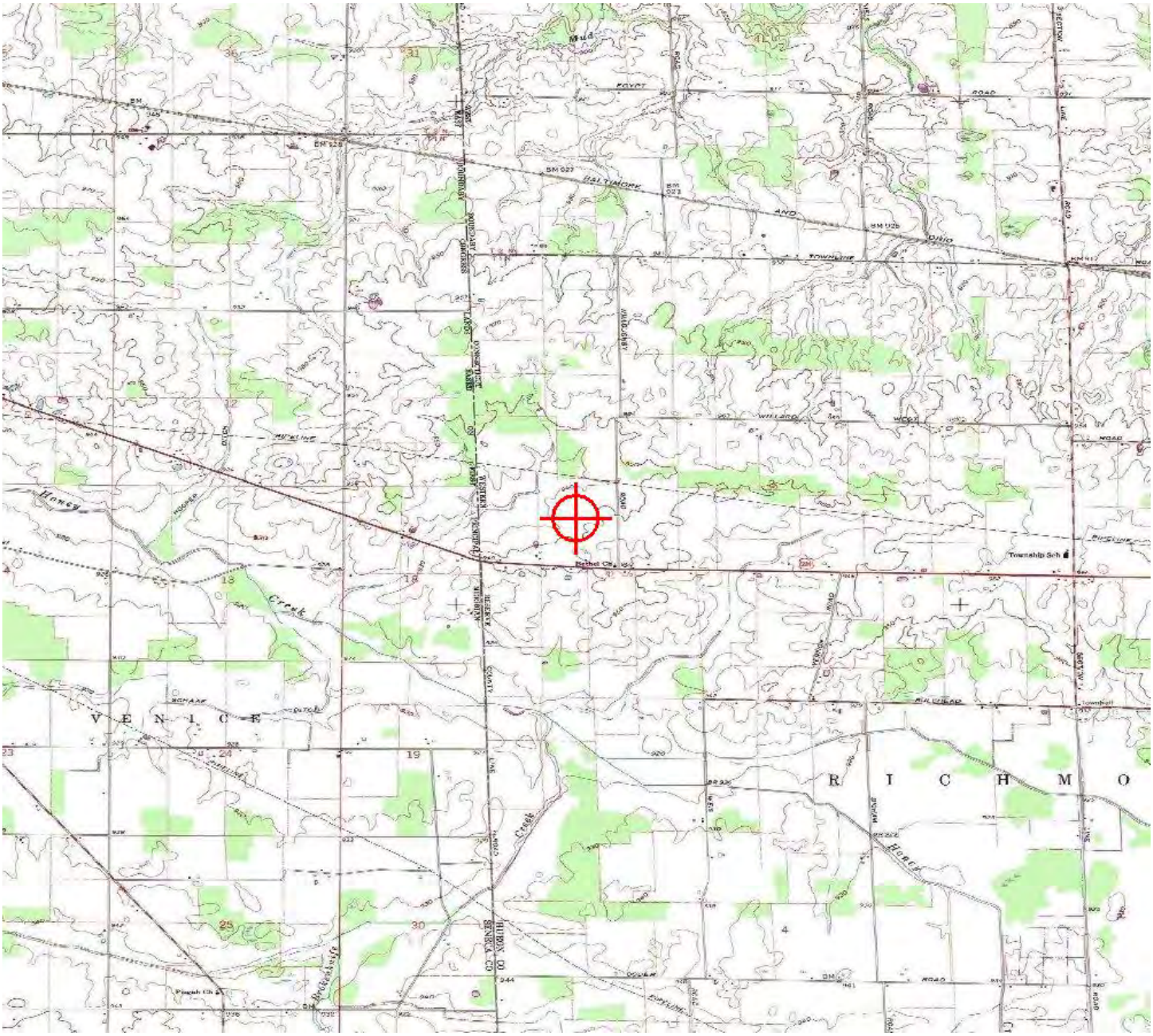
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11987-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11988-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T84
Location:	Bellevue, OH
Latitude:	41-19-46.89N NAD 83
Longitude:	82-44-30.18W
Heights:	708 feet site elevation (SE)
	659 feet above ground level (AGL)
	1367 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11988-OE.

Signature Control No: 392869141-430570725 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

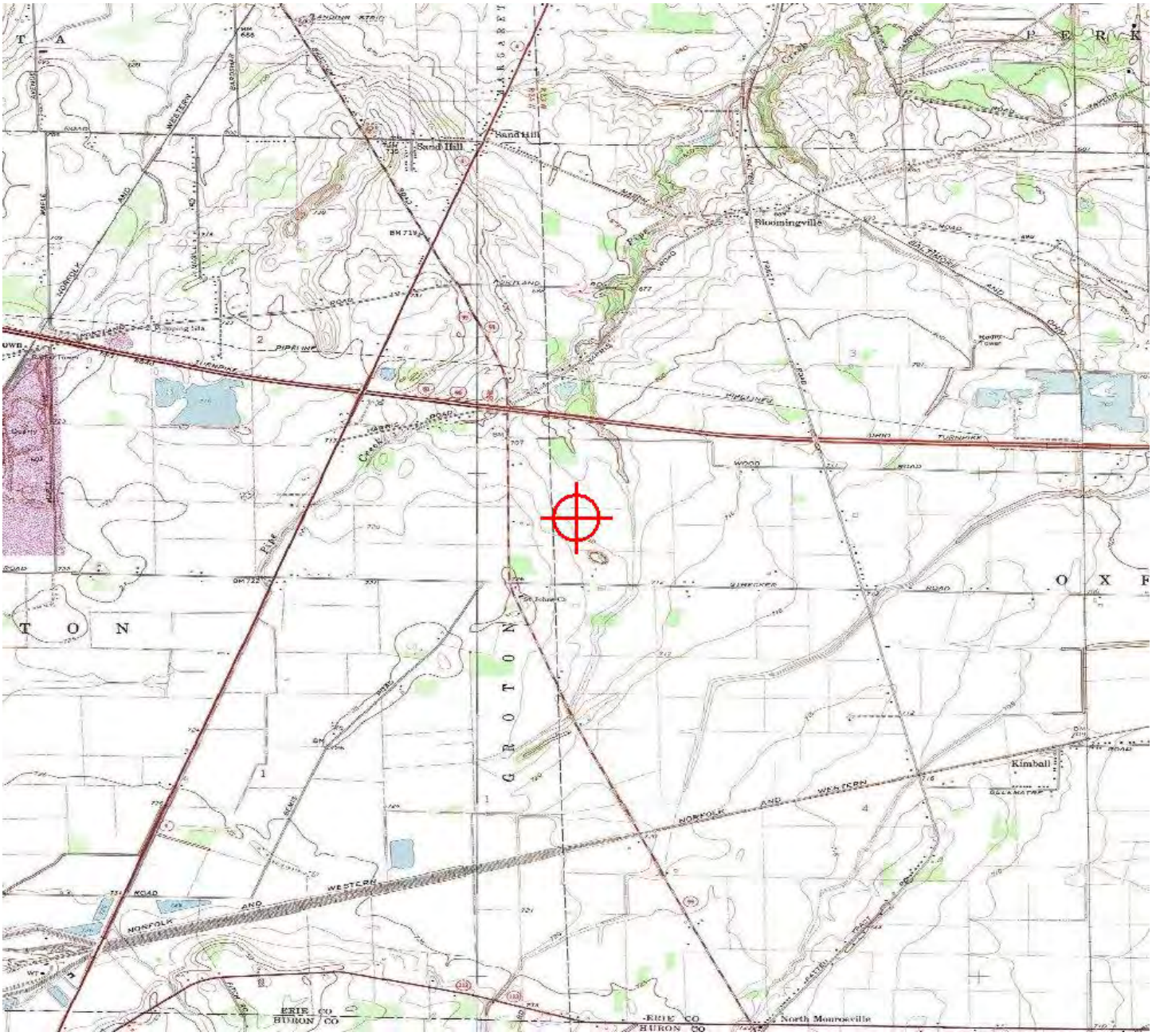
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

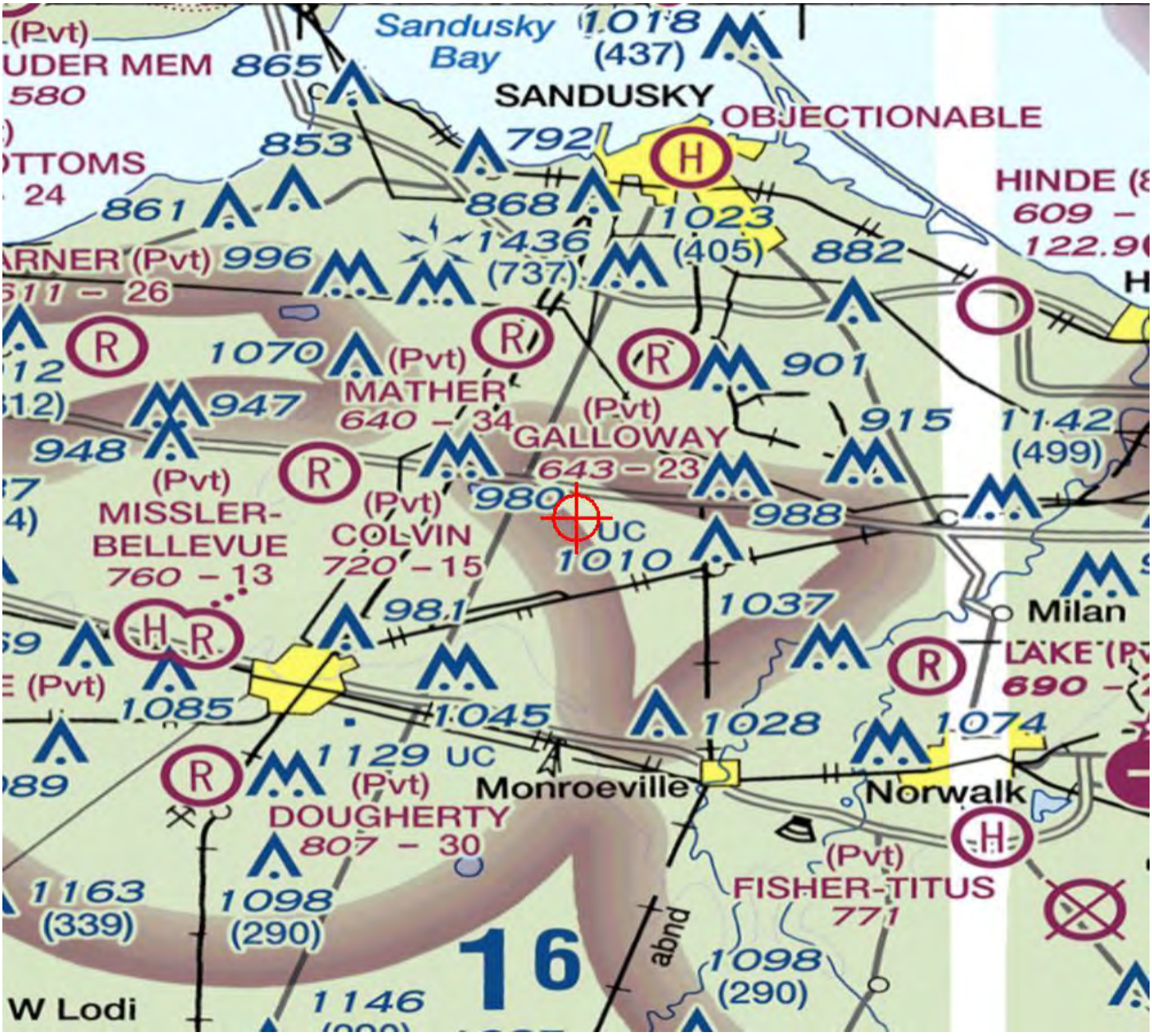
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11988-OE



Sectional Map for ASN 2018-WTE-11988-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11989-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T85
Location:	Bellevue, OH
Latitude:	41-19-45.02N NAD 83
Longitude:	82-45-11.05W
Heights:	722 feet site elevation (SE)
	659 feet above ground level (AGL)
	1381 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11989-OE.

Signature Control No: 392869142-430570726 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

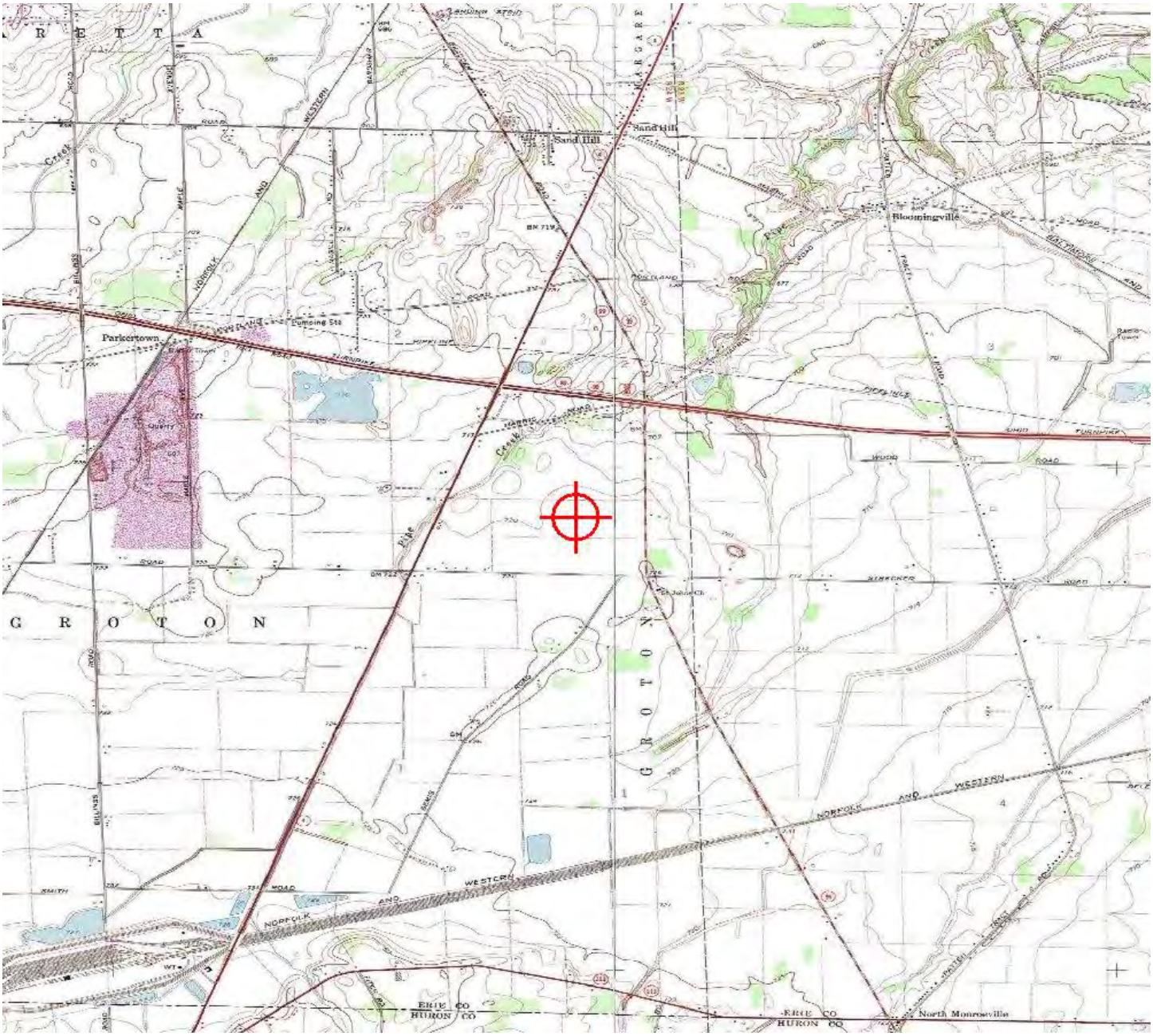
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

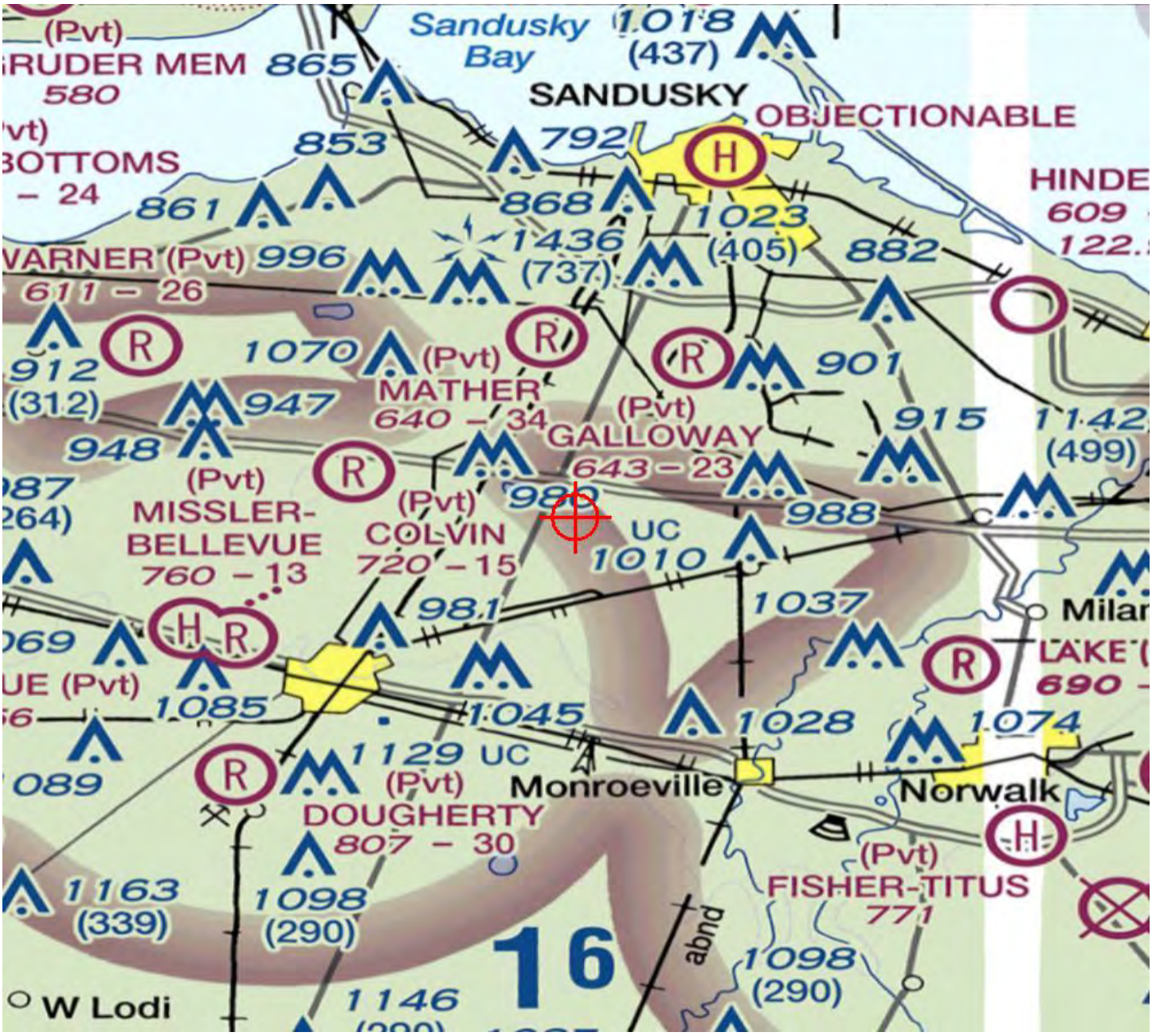
and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11989-OE



Sectional Map for ASN 2018-WTE-11989-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11990-OE

Issued Date: 02/12/2020

Nate Pedder
Firelands Wind, LLC
310 4th St. N.E., Suite 300
Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T86
Location:	Bellevue, OH
Latitude:	41-19-40.50N NAD 83
Longitude:	82-44-11.22W
Heights:	708 feet site elevation (SE)
	659 feet above ground level (AGL)
	1367 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11990-OE.

Signature Control No: 392869143-430570728 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

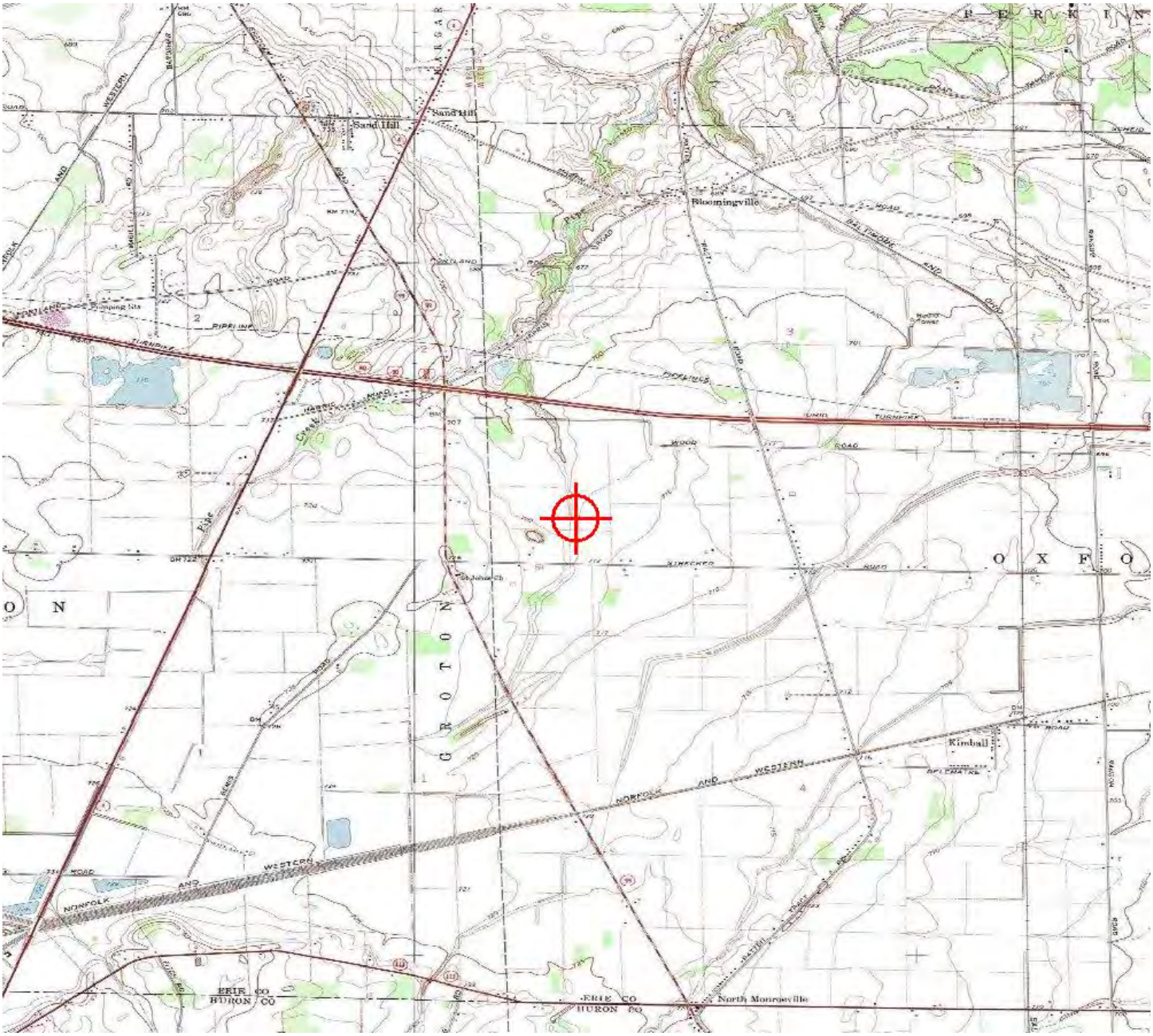
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

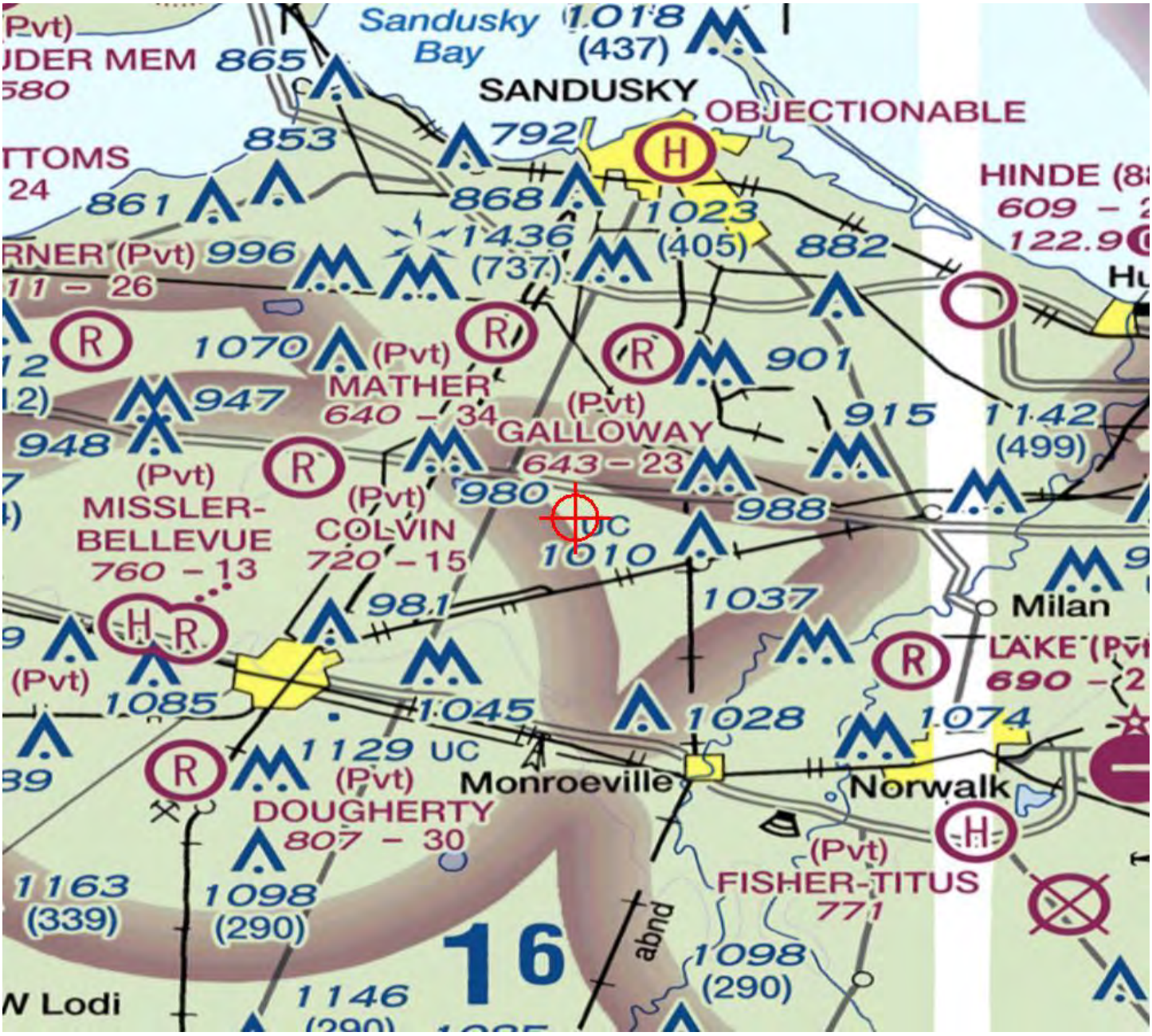
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11990-OE




Sandusky Bay
1018
(437)
SANDUSKY
OBJECTIONABLE
865
853
792
861
868
1023
(405)
1436
(737)
996
882
1070
(Pvt)
MATHER
640 – 34
901
947
(Pvt)
GALLOWAY
643 – 23
915
1142
(499)
948
980
988
(Pvt)
MISSLER-
BELLEVUE
760 – 13
(Pvt)
COLVIN
720 – 15
UC
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981
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Milan
1085
1045
1028
1074
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(Pvt)
DOUGHERTY
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Monroeville
Norwalk
(Pvt)
FISHER-TITUS
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1098
(290)
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abnd
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(290)
1146
(290)
Lodi

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2018-WTE-11991-OE

Issued Date: 02/12/2020

Nate Pedder
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Charlottesville, VA 22902

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ** (CORRECTION)**

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T87
Location:	Bellevue, OH
Latitude:	41-14-31.12N NAD 83
Longitude:	82-49-37.55W
Heights:	782 feet site elevation (SE)
	659 feet above ground level (AGL)
	1441 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/24/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before March 13, 2020. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager of the Airspace Policy Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on March 23, 2020 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Policy Group via telephone – 202-267-8783.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. This determination is valid for coordinates within one (1) second latitude/longitude and up to the approved AMSL height listed above. If a certified 1A or 2C accuracy survey was required to mitigate an adverse effect, any change in coordinates or increase in height will require a new certified accuracy survey and may require a new aeronautical study.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. All information from submission of Supplemental Notice (7460-2 Part 2) will be considered the final data (including heights) for this structure. Any future construction or alteration, including but not limited to changes in heights, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when

they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

This determination cancels and supersedes prior determinations issued for this structure.

If we can be of further assistance, please contact Paul Holmquist, at (206) 231-2990, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2018-WTE-11991-OE.

Signature Control No: 392869144-430570765 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

CORRECTED COPY ISSUED DUE TO ADMINISTRATIVE ERROR. FINAL DETERMINATION: THIS DETERMINATION IS NOT ELIGIBLE FOR PETITION

Abbreviations

AGL - above ground level | AMSL - above mean sea level | RWY - runway
VFR - visual flight rules | IFR - instrument flight rules | NM - nautical mile
ASN- Aeronautical Study Number | CAT - category aircraft | NEH - no effect height
MDA - minimum descent altitude | DA - decision altitude
TPA - traffic pattern altitude
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

For the sake of efficiency, the 85 proposed wind turbines in this project are included in this narrative. Separate determinations for each proposed structure can be found at http://oeaaa.faa.gov.

1. LOCATION OF PROPOSED CONSTRUCTION

The proposed Firelands Wind LLC wind turbine project lies approximately between 11.1 NM east, northeast to 17.7 NM southeast of the Airport Reference Point (ARP) for the Sandusky County Regional Airport (S24), near Fremont, OH. The S24 elevation is 665 AMSL. It can also be described as located approximately between 3.75 NM northwest to 18.2 NM north, northwest of Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

The proposed wind turbines' described heights and locations are expressed in AGL/AMSL and latitude/ longitude.

ASN	Structure Name	AGL/AMSL	LAT/LONG
2018-WTE-11906-OE	T1	659 / 1375	41-20-13.53N / 82-47-50.44W
2018-WTE-11907-OE	T10	659 / 1379	41-18-40.69N / 82-47-05.49W
2018-WTE-11908-OE	T11	659 / 1381	41-18-35.12N / 82-47-59.11W
2018-WTE-11909-OE	T12	659 / 1385	41-18-20.22N / 82-47-15.50W
2018-WTE-11910-OE	T13	659 / 1383	41-18-18.46N / 82-46-53.64W
2018-WTE-11911-OE	T14	659 / 1363	41-18-13.69N / 82-41-49.09W
2018-WTE-11912-OE	T15	659 / 1357	41-18-11.01N / 82-41-18.24W
2018-WTE-11913-OE	T16	659 / 1351	41-18-06.70N / 82-41-02.12W
2018-WTE-11914-OE	T17	659 / 1375	41-17-51.98N / 82-44-29.72W
2018-WTE-11915-OE	T18	659 / 1383	41-17-41.67N / 82-45-14.48W
2018-WTE-11916-OE	T19	659 / 1377	41-17-42.06N / 82-44-16.18W
2018-WTE-11917-OE	T2	659 / 1375	41-20-05.46N / 82-46-13.71W
2018-WTE-11919-OE	T21	659 / 1401	41-17-12.38N / 82-45-19.15W
2018-WTE-11920-OE	T22	659 / 1389	41-17-02.56N / 82-44-12.71W
2018-WTE-11921-OE	T23	659 / 1413	41-15-49.62N / 82-45-25.29W
2018-WTE-11922-OE	T24	659 / 1441	41-15-41.31N / 82-48-35.15W

2018-WTE-11923-OE	T25	659 / 1439	41-15-24.83N / 82-48-41.23W
2018-WTE-11924-OE	T26	659 / 1443	41-15-19.91N / 82-48-17.28W
2018-WTE-11925-OE	T27	659 / 1435	41-14-51.86N / 82-46-32.11W
2018-WTE-11926-OE	T28	659 / 1417	41-14-50.80N / 82-45-19.11W
2018-WTE-11927-OE	T29	659 / 1447	41-14-45.63N / 82-47-48.58W
2018-WTE-11928-OE	T3	659 / 1351	41-19-53.29N / 82-41-13.45W
2018-WTE-11929-OE	T30	659 / 1435	41-14-40.17N / 82-46-16.48W
2018-WTE-11930-OE	T31	659 / 1415	41-14-39.51N / 82-45-07.90W
2018-WTE-11931-OE	T32	659 / 1447	41-14-32.40N / 82-47-52.63W
2018-WTE-11932-OE	T33	659 / 1411	41-14-31.14N / 82-44-40.06W
2018-WTE-11933-OE	T34	659 / 1445	41-14-25.33N / 82-49-55.61W
2018-WTE-11934-OE	T35	659 / 1433	41-14-17.41N / 82-46-15.83W
2018-WTE-11935-OE	T36	659 / 1417	41-14-16.85N / 82-45-03.60W
2018-WTE-11936-OE	T37	659 / 1451	41-14-09.25N / 82-49-34.69W
2018-WTE-11937-OE	T38	659 / 1461	41-14-05.43N / 82-50-02.03W
2018-WTE-11938-OE	T39	659 / 1447	41-13-44.73N / 82-48-17.47W
2018-WTE-11939-OE	T4	659 / 1347	41-19-39.09N / 82-41-03.03W
2018-WTE-11941-OE	T41	659 / 1443	41-12-13.95N / 82-46-53.36W
2018-WTE-11942-OE	T42	659 / 1441	41-12-01.31N / 82-46-38.15W
2018-WTE-11943-OE	T43	659 / 1487	41-11-53.20N / 82-49-51.92W
2018-WTE-11944-OE	T44	659 / 1449	41-11-33.33N / 82-46-28.97W
2018-WTE-11945-OE	T45	659 / 1451	41-11-15.83N / 82-46-30.13W
2018-WTE-11946-OE	T46	659 / 1455	41-10-54.73N / 82-46-54.79W
2018-WTE-11947-OE	T47	659 / 1479	41-10-35.69N / 82-49-46.04W
2018-WTE-11948-OE	T48	659 / 1495	41-09-17.21N / 82-48-41.34W
2018-WTE-11949-OE	T49	659 / 1487	41-09-06.18N / 82-46-53.24W
2018-WTE-11950-OE	T5	659 / 1345	41-19-38.77N / 82-40-48.16W
2018-WTE-11951-OE	T50	659 / 1503	41-09-00.95N / 82-49-20.03W
2018-WTE-11952-OE	T51	659 / 1501	41-08-54.22N / 82-48-42.36W
2018-WTE-11953-OE	T52	659 / 1521	41-08-31.18N / 82-49-57.60W
2018-WTE-11954-OE	T53	659 / 1523	41-08-19.44N / 82-49-57.20W
2018-WTE-11955-OE	T54	659 / 1493	41-08-20.55N / 82-46-14.82W
2018-WTE-11956-OE	T55	659 / 1495	41-08-15.32N / 82-46-36.45W
2018-WTE-11957-OE	T56	659 / 1509	41-08-13.84N / 82-47-29.27W
2018-WTE-11958-OE	T57	659 / 1517	41-08-10.51N / 82-49-32.23W
2018-WTE-11959-OE	T58	659 / 1499	41-07-57.73N / 82-46-08.52W
2018-WTE-11960-OE	T59	659 / 1519	41-07-50.95N / 82-49-19.41W
2018-WTE-11961-OE	T6	659 / 1377	41-19-06.64N / 82-47-51.79W
2018-WTE-11962-OE	T60	659 / 1513	41-06-56.14N / 82-44-39.92W
2018-WTE-11963-OE	T61	659 / 1539	41-06-49.98N / 82-48-33.74W
2018-WTE-11964-OE	T62	659 / 1519	41-06-39.47N / 82-44-39.47W
2018-WTE-11965-OE	T63	659 / 1545	41-06-27.36N / 82-48-25.46W
2018-WTE-11966-OE	T64	659 / 1561	41-05-54.65N / 82-49-40.26W
2018-WTE-11967-OE	T65	659 / 1553	41-05-47.68N / 82-48-24.50W
2018-WTE-11968-OE	T66	659 / 1537	41-05-44.33N / 82-45-49.33W
2018-WTE-11969-OE	T67	607 / 1483	41-05-39.35N / 82-46-14.28W
2018-WTE-11970-OE	T68	659 / 1541	41-05-33.76N / 82-46-38.70W
2018-WTE-11971-OE	T69	659 / 1547	41-05-30.09N / 82-47-20.16W
2018-WTE-11972-OE	T7	659 / 1381	41-19-04.98N / 82-46-59.20W

2018-WTE-11973-OE	T70	607 / 1511	41-05-17.21N / 82-49-04.73W
2018-WTE-11974-OE	T71	659 / 1541	41-05-13.47N / 82-46-37.25W
2018-WTE-11975-OE	T72	659 / 1377	41-19-02.70N / 82-47-24.36W
2018-WTE-11976-OE	T73	659 / 1381	41-18-35.43N / 82-48-57.49W
2018-WTE-11977-OE	T74	659 / 1379	41-18-25.38N / 82-49-04.39W
2018-WTE-11978-OE	T75	659 / 1439	41-15-37.82N / 82-48-11.21W
2018-WTE-11980-OE	T77	659 / 1447	41-11-50.81N / 82-46-34.22W
2018-WTE-11981-OE	T78	659 / 1519	41-08-01.35N / 82-49-23.51W
2018-WTE-11982-OE	T79	659 / 1517	41-06-39.21N / 82-44-24.98W
2018-WTE-11983-OE	T8	659 / 1377	41-18-59.80N / 82-46-33.86W
2018-WTE-11984-OE	T80	659 / 1615	41-03-54.95N / 82-49-29.80W
2018-WTE-11985-OE	T81	659 / 1617	41-03-30.60N / 82-49-29.10W
2018-WTE-11986-OE	T82	607 / 1539	41-02-58.70N / 82-49-37.70W
2018-WTE-11987-OE	T83	659 / 1604	41-02-55.86N / 82-49-23.69W
2018-WTE-11988-OE	T84	659 / 1367	41-19-46.89N / 82-44-30.18W
2018-WTE-11989-OE	T85	659 / 1381	41-19-45.02N / 82-45-11.05W
2018-WTE-11990-OE	T86	659 / 1367	41-19-40.50N / 82-44-11.22W
2018-WTE-11991-OE	T87	659 / 1441	41-14-31.12N / 82-49-37.55W
2018-WTE-11992-OE	T9	659 / 1379	41-18-50.99N / 82-47-16.55W
2019-WTE-1150-OE	T20	659 / 1382	41-17-30.41N / 82-44-06.47W

2. OBSTRUCTION STANDARDS EXCEEDED

The proposed turbines would exceed Part 77 standards as described below.

a. Section 77.17(a)(1): The surface above 499 feet AGL, in which an object would be an obstruction to aircraft operating under VFR conditions in the en route phase of flight established under 77.17, 77.19, or 77.23.

All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet.

b. Section 77.17(a)(2): A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within three nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 499 feet. 18 proposed structures in this project exceed this surface for the Willard Airport (8G1), Willard, OH. The 8G1 elevation is 967 AMSL.

ASN	Exceeds Section 77.17(a)(2) for 8G1 by (feet)
2018-WTE-11959-OE	34
2018-WTE-11962-OE	177
2018-WTE-11963-OE	80
2018-WTE-11964-OE	211
2018-WTE-11965-OE	122
2018-WTE-11966-OE	105
2018-WTE-11967-OE	177
2018-WTE-11968-OE	286
2018-WTE-11969-OE	223

2018-WTE-11970-OE	272
2018-WTE-11971-OE	249
2018-WTE-11973-OE	127
2018-WTE-11974-OE	299
2018-WTE-11982-OE	212
2018-WTE-11984-OE	266
2018-WTE-11985-OE	281
2018-WTE-11986-OE	202
2018-WTE-11987-OE	285

Five proposed structures lies within Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. It would exceed the TPA Section 77.17(a)(2) surface as applied to a visual approach runway as described below.

The five proposed wind turbines would lie within the lateral boundaries and penetrate the aircraft Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The proposed turbines would be outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

ASN	Exceeds Section 77.17(a)(2) TPA for 8G1 by (feet)
2018-WTE-11968-OE	221
2018-WTE-11969-OE	167
2018-WTE-11970-OE	225
2018-WTE-11971-OE	231
2018-WTE-11974-OE	225

c. Section 77.17(a)(3) -- A structure that causes less than the required obstacle clearance within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area resulting in increases to an IFR terminal minimum altitude.

ASN 2018-WTE-11987-OE penetrates 8G1 RWY 28 Diverse A departure area 570 feet requiring Takeoff Minimums and (Obstacle) Departure Procedures RWY 28: standard weather departure minimums with a minimum climb gradient of 201 feet per NM to 1900 AMSL.

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2600 AMSL.

2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE

2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

Erie-Ottawa Intl (PCW) Port Clinton OH. NDB RWY 27 Minimum Safe Altitude (MSA) 180 inbound clockwise to 090 inbound increase from 2500 to 2700 AMSL.

2018-WTE-11984-OE
2018-WTE-11985-OE

Swanton OH TOL Toledo ATCT/TRACON Chart TOL_MVA_FUS3_2018 Minimum Vectoring Altitude (MVA) or Minimum IFR Altitude (MIA) increase Sector F MVA from 2500 to 2600 AMSL.

2018-WTE-11967-OE
2018-WTE-11987-OE

3. EFFECT ON AERONAUTICAL OPERATIONS

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: no substantial adverse effects.

The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1.

The effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes: All of the turbines listed in Section 1 of this narrative exceed the Part 77 Section 77.17(a)(1) surface by 160 feet. Proposed structures identified in Section 2 of this narrative exceed Part 77 Section 77.17(a)(2) as previously described no substantial adverse effect was found. Further study obtained flight trajectory data for areas over the project. All areas showed less than significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: : no substantial adverse effect. Affected Air Traffic facilities have determined no substantial adverse effect at this time. Affected procedures will be adjusted upon notification of construction of the proposed structures.

c. The impact on all planned public-use airports and aeronautical facilities: no substantial adverse effect.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: no substantial adverse effect.

RADAR

Analysis indicates that the proposed turbines in this project would be in the line of sight for the Mansfield, OH Airport Surveillance Radar-8 (ASR-8), the Cleveland (CLE) Airport Surveillance Radar (ASR-9) and the Brecksville, OH (QBD) Common Air Route Surveillance Radar (CARSR) and may cause clutter to the primary signal in the vicinity of the affected turbine, however, Air Traffic has determined this would not create a substantial adverse impact on their operations at this time.

DEPARTMENT OF DEFENSE

The structures will be located within the confines or near a military training route or military training area. All structures associated with the project are located in an area where affordable and feasible actions can be taken by the Air Force to mitigate the project's impacts to the Air Force mission.

5. CIRCULATION AND COMMENTS RECEIVED

The proposal was circulated for public comment on 24 July 2019 and public comment period closed on 30 August 2019. Two comments were received by 30 August 2019. Two late comments were received 17 September and 19 September 2019 and will not be considered as part of this determination.

Comments were made saying the proposed wind turbines would impact the two public use airports at each end of the project, would also impact the air ambulances operating in the area and would impact aerial applicator operations and stated the project will cause a lot of problems for air traffic in our area.

Without airport names it is difficult to address which two airports the comments refer to. It can be assumed the Willard Airport (located approximately 3.75 NM from the southeast corner of the project) may be one of these. No VFR Part 77 airport surfaces were found to be affected by the proposed project therefore there are no substantial adverse effects to public use airports in the vicinity of the proposed project.

Part 77 Section 77.17(a)(2) was exceeded by 18 of the proposals as indicated above however our determinations are based on the completed aeronautical study and not simply whether or not they exceed obstruction standards.

Aeronautical operations reports were attained for three areas over the proposed project in the vicinity of the 18 structures. This flight trajectory data for those areas showed less than a significant volume of VFR aeronautical operations in the vicinity of the proposed structures.

Five proposed structures lies within the Willard Airport (8G1) Traffic Pattern Airspace (TPA) as described in FAA JO 7400.2M, 6-3-8, Evaluating Effect on Visual Flight Rules (VFR) Operations. The five proposed wind turbines would lie within the lateral boundaries and penetrate the Part 77 Section 77.17(a)(2) Category D VFR TPA for RWY 10/28 at 8G1. Category D aircraft are those aircraft with an approach speed of between 141-165 knots. The turbines are outside of traffic pattern airspace for all aircraft with an approach speed of less than 141 knots.

Willard Airport (8G1) reports 515 annual operations with no permanently based aircraft. The asphalt runway dimensions are 4028 x 65 feet. Traffic Flow Management System Counts (TFMSC), Aviation System Performance Metrics (ASPM) reports an annual total of 11 IFR departures and 5 IFR arrivals at 8G1, all Category A aircraft.

Approach Category D aircraft do not normally use Willard Airport. The proposed turbines are located outside the VFR traffic pattern airspace for all categories of aircraft that normally use 8G1 therefore there is no effect to the 8G1 VFR traffic pattern.

Comments were made regarding the economic effects of the project, however, economic considerations are not germane to studies conducted in accordance with Part 77.

Consideration is not given to operations such as emergencies (air ambulance flights) because they are not considered regular and continuing.

The commenter stated the aerial applicators affected had issued warning there are areas where they cannot operate if the project is built. Agricultural operations, such as crop dusting, are conducted below the minimum altitudes specified in 14 CFR Part 91 and are not considered in determining the extent of adverse effect for 14 CFR Part 77 aeronautical studies.

Other comments made stated the proposed wind turbines should not be built because they exceed obstruction standards and would impact the pleasure of flight and crop inspections.

The FAAs determination of whether a proposal would or would not be a hazard to air navigation is based on the findings of the completed aeronautical study and not simply whether or not they exceed the obstruction standards.

The commenter did not provide a number of affected flights or specific flight routes and the address provided by the commenter is over 5 NM from the nearest proposed wind turbine in the project.

Aeronautical operations reports were attained for areas over the proposed project near this commenter's address. Both areas showed less than significant volume of VFR en route aeronautical operations in the vicinity of the proposed structures.

The Willard Airport (8G1) Airport Master Record can be viewed/downloaded https://adip.faa.gov/agis/public/#/airportData/8G1 . It states there are 0 single-engine, 0 multi-engine, 0 jet, 0 helicopter, 0 military, 0 ultra-light and 0 glider aircraft based there with 515 operations for the 12 months ending 28 September 2018 (latest information).

4. DETERMINATION - NO HAZARD TO AIR NAVIGATION

The FAA has determined the proposed construction would not have a substantial adverse effect on the safe and efficient use of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation provided the conditions set forth in this determination are met.

5. BASIS FOR DECISION

Study for possible VFR effect disclosed that the proposed structures would have no substantial effect on any existing or proposed arrival or departure VFR operations or procedures. Aeronautical study found that the proposed structures would not conflict with airspace required to conduct normal VFR traffic pattern operations at any other known public use or military airport. At 659 feet above ground level, the proposed structures would not have a substantial adverse effect on VFR en route flight operations as a significant volume of VFR operations was not found to be affected and no information was received to indicate they would be located within any known regularly and continuously used VFR routes. There will be no IFR effects as the affected

airspace will be adjusted to mitigate the height of the structures and FAA Air Traffic determined this would not have a substantial adverse effect to their operations.

The proposed structures must be appropriately obstruction marked and/or lighted to make them more conspicuous to aircraft operations.

6. CONDITIONS

For the following studies as identified by their ASN, at least 56 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

2018-WTE-11967-OE
2018-WTE-11987-OE

For the following studies as identified by their ASN, at least 10 days before the start of construction the proponent is required to file a FAA form 7460-2, Part 1, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be used to update published instrument flight procedures.

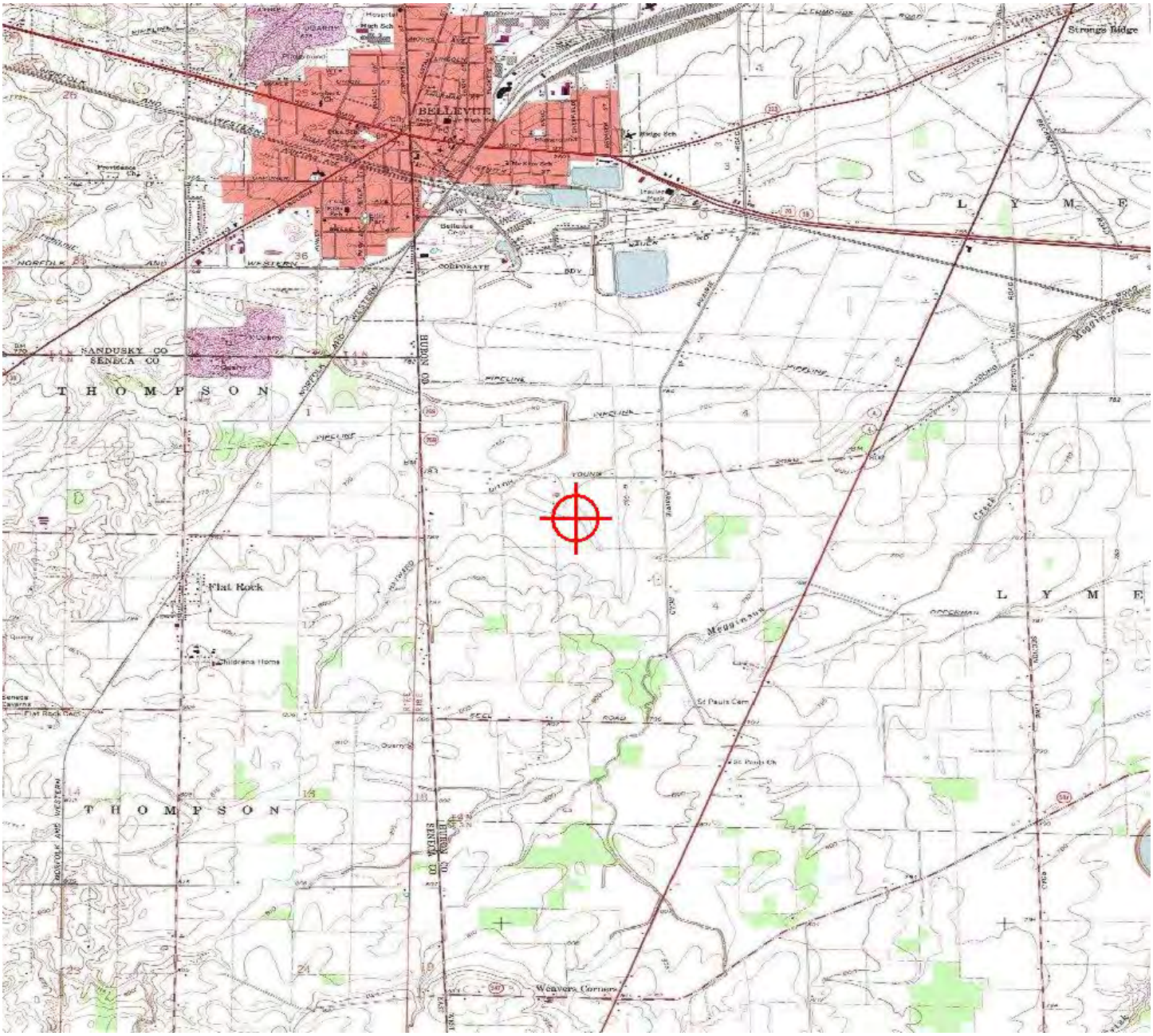
2018-WTE-11951-OE
2018-WTE-11952-OE
2018-WTE-11953-OE
2018-WTE-11954-OE
2018-WTE-11957-OE
2018-WTE-11960-OE
2018-WTE-11962-OE
2018-WTE-11963-OE
2018-WTE-11964-OE
2018-WTE-11965-OE
2018-WTE-11966-OE
2018-WTE-11967-OE
2018-WTE-11968-OE
2018-WTE-11970-OE
2018-WTE-11971-OE
2018-WTE-11973-OE
2018-WTE-11974-OE
2018-WTE-11981-OE
2018-WTE-11982-OE
2018-WTE-11984-OE
2018-WTE-11985-OE
2018-WTE-11986-OE
2018-WTE-11987-OE

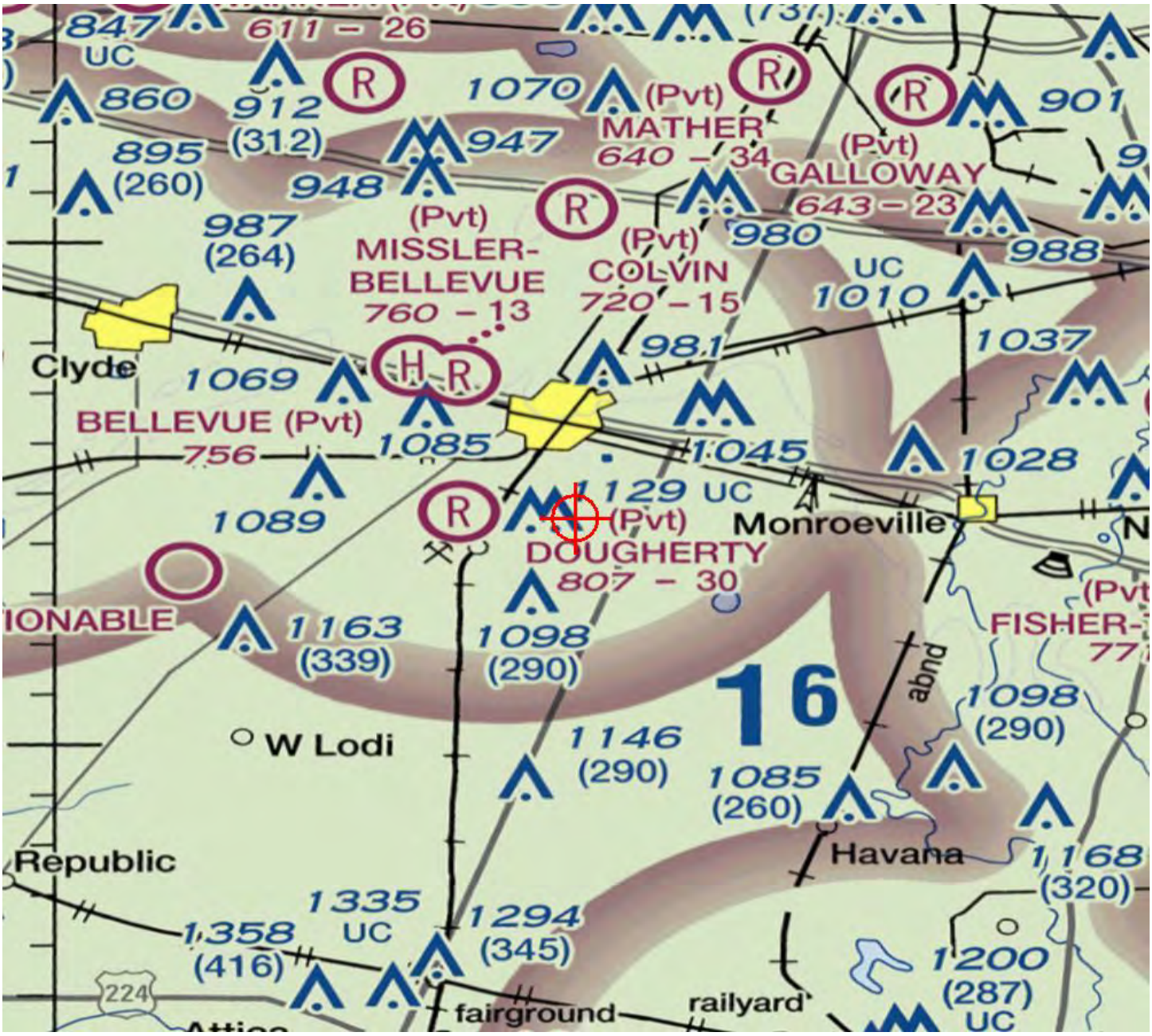
Within five days after each structure reaches its greatest height, the proponent is required to file a FAA form 7460-2, Actual Construction notification, at the OE/AAA website (http://oeaaa.faa.gov). This actual construction notification will be the source document detailing the site location, site elevation, structure height,

and date structure was built for the FAA to map the structure on aeronautical charts and update the national obstruction database.

OBSTRUCTION MARKING AND LIGHTING NOTE: A recommendation for white paint/synchronized red lights will be made for all turbines until such time as the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height. At that time, the proponent may contact this office and request a re-evaluation of the marking and lighting recommendations for the turbines within this project and a portion of the turbines may qualify for the removal of the lighting recommendation

TOPO Map for ASN 2018-WTE-11991-OE

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Case No(s). 18-1607-EL-BGN

Summary: Testimony - Direct Testimony of Benjamin M. Doyle electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC