Section 32

Best Practical Mitigation

Section 32. Best Practical Mitigation

32.1 State Standards

Pursuant to Chapter 34-A: Expedited Permitting of Grid Scale Wind Energy Development, applications for wind energy projects must contain: "*best practical mitigation for all aspects of construction and operation of generating facilities."*

Best Practical Mitigation is defined as:
"methods or technologies used during construction or operation of a wind energy development that control or reduce to the lowest feasible level impacts to scenic or wildlife resources in accordance with rules adopted by the department."

In determining best practical mitigation options the primary siting authority, here the DEP, shall consider: The existing state of the technology; the effectiveness of available technologies or methods for reducing impacts; and the economic feasibility of the type of mitigation under consideration. 35-A M.R.S. § 3459.

32.2 Scenic

The Applicant has selected a location for the Project that will have limited scenic impacts. To support this, the Applicant reviewed the scenic impact of the proposed Project through its Visual Impact Assessment ("VIA") (Section 30), its historical studies, and consultation with MHPC (Section 8).

As documented in the Project's VIA (Exhibit 30-1), although there are 24 SRSNSs within 8 miles of the Project, the 3 turbines are sited among the existing terrain and vegetation and only 3 SRSNSs are expected to have views of the Project. These SRSNS include: Joes Pond, the Rumford Municipal Building, and Swift River. Joes Ponds and the Rumford Municipal Building have limited public access and will have views of the Project and RoxWind. The third location, Swift River, will have views of the Project, RoxWind, and Record Hill for approximately 1,000 feet. As designed, the proposed Project will have a limited impact on SRSNSs. As outlined in the VIA, the Project has been evaluated by Viewshed to have a "Low" overall scenic impact on each of the three SRSNSs with views of the Project. In addition, Viewshed concluded that the cumulative impact at each SRSNSs "*does not constitute an unreasonable adverse impact.*"

The Applicant has investigated use of Aircraft Detection Lighting Systems ("ADLS") for this Project. Due to (i) very low, if any, nighttime use of the three SRSNS with Project visibility at night, (ii) the fact that existing turbines from other projects that do not employ

ADLS will be visible from each of the three SRSNS, and (iii) the relatively high cost of ADLS for this Project, use of ADLS does not constitute best practical mitigation.

First, none of the SRSNSs with views of the Project are expected to have public nighttime usage. Rumford Municipal Building houses the Town's municipal offices and has potential visibility from the upper floors but it is not regularly open to the public at night. Joes Pond has gated access and signed as private property. Similarly, the closest access point for the Swift River, Bunker Pond, does not have a boat ramp or formal parking. Thus, there are few, if any, users of SRSNS that would be impacted by the FAA required night lighting of the Project.

Second, each of the three SRSNS already has views of existing lit turbines from either the Record Hill and/or RoxWind projects. Specifically, Record Hill has 22 lit turbines and RoxWind has four lit turbines. The 26 existing turbines will be visible with the Project along a 1000' stretch of the Swift River. The 4 RoxWind turbines are currently visible at 5-6 miles away from the Rumford Municipal Building and Joes Pond. The Project will be seen as part of a combined nighttime view with the lit RoxWind turbines at those two locations. Thus, eliminating lights from the Project would not have any meaningful impact on potential nighttime users of the three SRSNS due to the presence of existing lit turbines.

Finally, use of ADLS for the Project has a relatively high cost. According to the Applicant's research, there have been five systems approved by the FAA for ADLS and commercially available for purchase: Laufer (2 Systems), DeTect, Vestas, and Terma. Currently, only DeTect and Terma are still commercially available. The Applicant has contacted both firms. While final design for an ADLS system would require review and approval from the FAA, the Applicant consulted with the available firms and received input from both. After reviewing the specific site, the Applicant has been advised that due to the terrain, two ADLS systems may be required to provide sufficient coverage to meet FAA requirements. Two ADLS systems for three turbines would burden the Project with a significant increase in capital costs,.[1]

In summary, the cost of ADLS for this Project is not practical in light of the insignificant benefit that would result from employment of the technology due to the fact that there is minimal use of any SRSNS with nighttime use and, importantly, this 3-turbine Project is

[1] The Applicant was provided with an informal quote for the Project that, when paired with delivery and installation, would be approximately $1 MM of increased costs for ADLS.

proposed south of the RoxWind (4 turbines) and Record Hill (22 turbines) wind projects; none of those 26 turbines have ADLS. Any benefit of installing an ADLS system at Twin would be de minimis given its location in an area with existing lit turbines.

The Applicant received determinations of no hazard for the three wind turbines as proposed. Those determinations are attached as Exhibit 32-1.

32.3 Wildlife

32.3.1 Minimizing Impacts to Habitat

Through extensive study and consultation with various agencies, the Project has been designed to minimize its overall impact on wildlife resources. As a 3-turbine Project, the Project naturally has a smaller overall footprint than larger projects. This limits the amount of clearing required as there are only three turbine pads, while providing significant energy generation from each location. The Project's layout (which includes using existing access roads where feasible), construction methods, and operation plans were designed to minimize overall wildlife impacts.

The Project has been designed by Sewall to incorporate appropriate erosion and stormwater controls while minimizing the overall footprint and impact of the Project. Turbine clearing areas will be stabilized and allowed to revegetate to a meadow buffer with the exception of the following: a 35-foot radius around the base of each turbine; 70-foot by 120-foot crane pads at each turbine; and a short 24-foot wide access drive to each of the crane pads. The total impervious area for the Project, including the access drives, crane paths, crane pads and turbine foundations, is 5.16 acres. The Project design includes treatment swales alongside the proposed road. The swales will treat the runoff prior to the runoff leaving the property. See Section 12 for more details.

The Project also received an easement from the adjacent landowner and project (RoxWind) to use an existing road and will follow the existing transmission corridor used by CMP and RoxWind. By using existing cleared areas, the Project will minimize overall habitat fragmentation.

In addition, where a new road is required, the Project will follow the existing grade where feasible and utilize areas already impacted by forestry activities. This is described in more detail in Section 7.

Due to the Project's small size and its use of existing infrastructure and impacted areas, the Applicant has minimized impacts to the extent feasible.

32.3.2 Protection of Listed Species

Site surveys indicate relatively low site usage by protected species. The Project is designed to minimize the impact to those species as described below and in detail in Section 7.

Northern Spring Salamanders

As outlined in the RTE Species Report, Exhibit 7-3 and in Section 7, NSS were observed in three streams during the NSS survey. In addition, one stream was assumed to have presence due to its connectivity. To minimize potential impacts, three of the four streams will have 250' buffers. The fourth stream (S-KMN-7) has been historically impacted and, through consultation with MDIFW, the Applicant is proposing a design to improve habitat for NSS in that location.

Bats

As discussed in Section 7, the Applicant followed two paths to review bat usage of the site. First, the Applicant consulted with MDIFW, including completing two site walks with MIDFW biologists. After those site walks, MDIFW concluded: "*Based on our observations and discussions from the two site visits to examine potential rock/talus bat hibernacula areas, we did not find compelling evidence of significant usage that warrants additional protective measures at the site. We believe that the proposed turbine locations are of sufficient distance from the rocky areas with the greatest potential for usage by bats."* (See RTE report, Exhibit 7-3)

With the uplisting of the NLEB in March 2023 which removed the 4(D) rule, the Project reengaged USFWS to discuss potential impacts to NLEB. The Project completed an acoustic bat survey during summer 2023 to meet USFWS requirements and after consulting with USFWS and MDIFW. The Bat Survey Report (Exhibit 7-7) summarizes the findings. The Bat Survey Report includes data collected over a 33-day period, across three detectors, or 99-detector nights of data. This significantly exceeds USFWS and MDIFW recommended data collection thresholds of 4 and 14 nights, respectively. Despite collecting considerably more data than required, the Bat Survey Report concludes no probable presence for NLEB[2] across the three detector locations. In addition, the Applicant has reviewed post-construction monitoring from the nearby Record Hill project. According to Record Hill's 2016 Post-construction Monitoring Report: "*Tree-roosting bat species (hoary, silver-haired, and red bat) represent the only bat species found in 2016, as well as in 2012 and 2014.*"[3]

[2] NLEB are federally listed as endangered under the Endangered Species Act.
[3] Stantec Consulting Services Inc. (Stantec). 2017. Final Post-Construction Monitoring Report Year 3, Record Hill Wind Project. Stantec Consulting Services Inc., Topsham, Maine, USA. 15 March 2017.

There are three other species of bats in Maine that are listed under MESA, Little brown bat (endangered), Eastern small-footed bat (threatened), and Tri-colored bat (threatened). The Bat Survey Report concludes that Little brown bat was confirmed for probable presence with four total data files and Tri-colored bat was confirmed for probable presence with one total data file, both over the 99-detector nights. As noted above, none of the three other species of bats in Maine that are listed under MESA were observed during Record Hill's post construction monitoring.

The Project will employ curtailment consistent with the most recent guidance from MDIFW to further ensure no adverse impacts to bat species. Both MDIFW[4] and USFWS[5] provide guidance to wind project developers regarding curtailing turbines below certain speeds during certain portions of the year. MDIFW's guidance was released in 2018. This year, USFWS released their guidance for NLEB's, including data from as recently as 2022. According to USFWS, no NLEB fatalities have been recorded at wind farms since 2016, despite having collected survey data from 131 facilities during that time. In addition, USFWS, using data from as recently as 2021, cites that raising cut-in speeds to 5 m/s "*have been demonstrated to reduce total bat fatalities by an average of 62%*."[6] Given MDIFW's higher curtailment recommendation, the sparse population recorded at site in 2023, the lack of significant habitat for the species observed by Applicant's biologists and MDIFW staff, and the historical data available for the area and USFWS's data on operating wind projects with respect to NLEB, the Applicant believes adhering to the 2018 guidance will be protective to the local bat population and constitutes best practical mitigation for minimizing impacts to bats..

In particular, the Applicant proposes:

- Operating only at cut-in wind speeds exceeding 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 15 –September 30, whenever the ambient air temperature is at or above 32 degrees Fahrenheit, measured at both ground level and nacelle hub height.

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[4]https://www.maine.gov/ifw/docs/Wind%20Power%20Preconstruction%20Recommendations%20to%20Avoid%20or%20Minimize%20Bat%20Mortality.pdf

[5]https://www.fws.gov/sites/default/files/documents/Interim%20Wind%20Guidance%20FAQs%20NLEB_6Mar23.pdf

[6] Land-based Wind Energy Interim Voluntary Guidance for the Northern Long-eared Bat (Myotis septentrionalis): FAQ Supplement

- Following the same weather parameters as above, increasing the cut-in wind speeds to 6.5 meters per second from July 16 – September 15.
- Requiring facility staff to record all discovered mortalities of bats and birds in an annual log.

Site reviews and surveys indicate no or low presence or usage of the site for protected species. These studies were undertaken after consultation with MDIFW and USFWS, as appropriate, and are outlined in Section 7.

For species with confirmed presence, the Applicant proposes to limit any potential adverse impact by 1) avoiding impact to NSS where feasible and stabilizing and improving a stream crossing where NSS were confirmed present; 2) curtailing the wind turbines during operation to protect bat species, in line with MDIFW's guidance for best practical mitigation.

32.3.3. Wetlands and Waterbodies

The Applicant designed the Project to avoid impacts to wetlands and watercourses to the extent commercially feasible. In particular, 41 watercourses and 140 non-contiguous wetlands were delineated during the Wetland and Watercourse Survey (Exhibit 7-13). This survey informed the Project design and eliminated the possibility of accessing the site from Rumford along Yonder Way, as that path had significantly more resources. To gain access from the Roxbury side, the Applicant negotiated with the adjacent landowner and RoxWind project to utilize the existing road on North Twin (See Section 2: Title, Right and Interest). As that road is already designed for wind project component delivery, it minimizes the amount of new road necessary to support the Project. In addition, the adjacent landowner has granted Applicant an easement to run its collector system adjacent to RoxWind's and CMP's utility infrastructure. This decreases the visual impact of the Project and, by clustering resources together, decreases overall habitat fragmentation. The road that will connect North Twin to South Twin is designed along existing grade, as feasible, to decrease the overall impact both from a resource and visual perspective.

The proposed Project design only impacts 18 of the 140 wetlands delineated. The Applicant has minimized wetland impacts to the extent feasible, impacting 14,953 square feet of wetlands. The majority of the 14,943 square feet of wetland impact will be permanent as it is either directly filled by the road or by the stormwater and stabilization to support working on the steep slopes or will require ongoing maintenance to satisfy clearing needs for the collector system. Temporary clearing only contributes a small amount to the Project's already minimized impact.

As described in Section 7, 12 of the wetlands were observed to have been impacted from forestry activity either through or adjacent to them, including all four that have associated resources. The Project design will stabilize the areas where appropriate and limit additional impact from unrelated activities.

There are six stream crossings proposed. The Applicant designed the Project to comply with Stream Smart standards where feasible.

In particular, the six stream crossings have the following bankfull widths and proposed crossings:

Stream ID	Average bankfull width	Proposed Culvert	Notes
S-KMN-7	37”	Open bottom structure, minimum of 1.2 bankfull width (Exhibit 1-3, sheet 9)	Perennial
S-KMN-37	67”	84” culvert, 42” embedded (Exhibit 1-3, sheet 8)	Intermittent
S-KMN-38	68”	84” culvert, 42” embedded (Exhibit 1-3, sheet 8)	Intermittent stream begins at center of crossing.
S-KMN-40	33”	60” culvert, 30” embedded (Exhibit 1-3, sheet 7)	Intermittent
S-KMN-41	53”	72” culvert, 36” embedded (Exhibit 1-3, sheet 7)	Intermittent
S-JLH-13	35”	48” culvert, 24” embedded (Exhibit 1-3, sheet 7)	Intermittent

Due to the steep elevation on site, Applicant submitted four of the stream crossings to MDIFW for their review prior to finalizing the civil design. These cross-sections are Exhibit 7-10. This includes two locations where the Applicant proposes to restore streams that were previously impacted from commercial forestry activities.

Stream S-KMN-40 appears to have been impacted by forestry activity, with its flow diverted from the original streambed. The Applicant proposes to re-align the flow to the assumed former drainage path. This design was done in consultation with MDIFW, via plan reviews and site visits.

Similarly, Stream S-KMN-7 was previously impacted by forestry activities. The Applicant proposes a large open box culvert and restoration in that area to improve habitat quality.

In addition, there are two other stream crossings where Applicant has consulted with MDIFW and MDIFW has reviewed and approved the stream crossings (S-KMN-41 and S-KMN-38).

The remaining two stream crossings will adhere to Stream Smart Crossing guidelines.

As the Project design impacts only 18 of the 140 delineated wetlands (12 of which have noted forestry impacts) and six of the 41 delineated streams, avoids entirely or improves NSS habitat, consulted with MDIFW and ACOE to minimize wetland and watercourse impacts, and follows Stream Smart Crossing guidelines when feasible, the Project design follows best practices to minimize impacts.

Exhibit 32-1
Determinations of No Hazard

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

Aeronautical Study No.
2022-WTE-601-OE

Issued Date: 05/26/2022

Palmer Management Corp.
Twin Energy LLC
13 Elm Street
Suite 200
Cohasset, MA 02025

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

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:	Rumford, ME
Latitude:	44-36-27.50N NAD 83
Longitude:	70-36-24.90W
Heights:	1906 feet site elevation (SE)
	645 feet above ground level (AGL)
	2551 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 M, Obstruction Marking and Lighting, white paint/synchronized red lights-Chapters 4,13(Turbines),&15.

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.

Any height exceeding 645 feet above ground level (2551 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 11/26/2023 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 June 25, 2022. 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 Rules and Regulations Group. Petitions can be submitted via mail to Federal Aviation Administration, 800 Independence Ave, SW, Washington, DC 20591, via email at OEPetitions@faa.gov, or via facsimile (202) 267-9328.

This determination becomes final on July 05, 2022 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 Rules and Regulations 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).

If we can be of further assistance, please contact Lan Norris, at (404) 305-6645, or Lan.norris@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2022-WTE-601-OE.

Signature Control No: 511037750-533532523 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

All FAA determinations and circularized cases are public record and available at the FAA's public website; https://oeaaa.faa.gov. The distribution for proposals circularized for public comments includes all "known" aviation interested persons and those who do not have an aeronautical interest but may become involved with specific aeronautical studies. Notification includes both postcard mailers and email notifications to those with registered FAA accounts. The FAA does not have a database for all persons with an aeronautical and non-aeronautical interest. Therefore, the public is encouraged to re-distribute and forward notices of circularized cases to the maximum extent possible. Additionally, it is incumbent upon local state, county and city officials to share notice of circularized cases with their concerned citizens.

A list of commonly used acronyms and abbreviations is available at the end of this document. A full list is available at the FAA's public website at https://oeaaa.faa.gov/oeaaa/downloads/external/content/FAA_Acronyms.pdf.

1. PROPOSAL DESCRIPTION

Proposed are three wind turbines for a wind farm project that would be located approximately 10.20 NM to 10.40 NM northwest of the Airport Reference Point (ARP) for Swans Field (3S2) Dixfield, ME. and approximately 13.60 NM to 14.00 NM northeast of the ARP for Bethel Regional (0B1) Bethel, ME. For the sake of efficiency, all three wind turbines in this project have similar impacts and are included in this narrative. The proposed wind turbines' described heights and locations are expressed in Above Ground Level (AGL) height, Above Mean Sea Level (AMSL) height and latitude / longitude.

ASN	/	AGL	/	AMSL	/	LAT	/	LONG
2022-WTE-601-OE	/	645	/	2551	/	44-36-27.50N	/	70-36-24.90W
2022-WTE-602-OE	/	645	/	2696	/	44-36-24.40N	/	70-36-44.10W
2022-WTE-603-OE	/	645	/	2781	/	44-36-14.50N	/	70-36-48.00W

2. TITLE 14 CFR PART 77 - OBSTRUCTION STANDARDS EXCEEDED

a. Section 77.17(a)(1); exceeds a height of 499 feet AGL at the site of the object. All proposed wind turbines would exceed this standard by 146 feet.

3. TITLE 14 CFR PART 77 - EFFECT ON AERONAUTICAL OPERATIONS

a. Section 77.29 (a)(1); the impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules. At a height greater than 499 feet AGL, the proposed wind farm would extend into airspace normally used for VFR en route flight and located within 2 statute miles (SM) of a potential VFR Route as defined by FAA Order 7400.2, Section 6-3-8. The turbines within 2 SM of a VFR route would have an adverse effect upon VFR air navigation. Further study was required to determine whether the structures would affect a significant volume of VFR aircraft resulting in a substantial adverse effect on VFR en route traffic.

b. Section 77.29(a)(6); effect on ATC radar, direction finders, ATC tower line-of-sight visibility, and physical or electromagnetic effects on air navigation, communication facilities, and other surveillance systems. The wind turbines be located within Radar Line of Sight (RLOS) of the Cumberland (CUMB) ASR-9 radar facility. The wind turbines may affect the quality and/or availability of the primary radar signals.

4. TITLE 14 CFR PART 77 - FURTHER STUDY AND PUBLIC COMMENTS

In order to facilitate the public comment process, all three studies were circularized under ASN 2022-WTE-602-OE on 04/14/2022, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. There were no comment received as a result of the circularization concluding on 05/21/2022.

5. BASIS FOR DETERMINATION

a. IFR Effects - The aeronautical study identified no IFR effects. Therefore, the proposal would have no substantial adverse effect on any existing or proposed IFR arrival/departure procedures, en route IFR operations or minimum IFR altitudes for any known public-use or military airports.

b. VFR Effects - The aeronautical study identified no effect on any existing or proposed VFR arrival or departure operations. The proposals would be located beyond the traffic pattern airspace for any known public use or military airports. At 645 feet AGL, the structures would be located within the altitudes commonly used for en route VFR flight. In coordination with ATC, an analysis of potential VFR Routes and available traffic data indicated that an average of less than one VFR aircraft per day may be affected by the proposed wind farm. In accordance with FAA Order 7400.2, the proposed wind farm would not affect a significant volume of aircraft and therefore, it is determined they will not have a substantial adverse effect on en route VFR flight operations.

The proposed structures would be charted on VFR sectional aeronautical charts and appropriately obstruction marked/lighted to make them more conspicuous to airmen should circumnavigation be necessary.

c. Radar Effects - The aeronautical study identified the proposed turbines as being within the RLOS of the Cumberland (CUMB) ASR-9 radar facility as described above. Impacts to radar only require a review by the responsible ATC facility and military services. Further study determined the structures would have no substantial adverse effect on military or air traffic operations at this time.

d. Cumulative Effect - The cumulative impact of the proposed structures, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any substantial adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposals affect the capacity of any known existing or planned public-use or military airport.

e. Military Airspace - The aeronautical study included a review by the Army, Navy, Air Force, Department of Defense (DOD) and Department of Homeland Security (DHS). The Department of Defense and U.S. Air Force identified the structures as being located within the confines or near a military training route or military training area. Although the military has no objections to this proposal, they indicated that further expansion of this project into military airspace may result in adverse impacts to military missions.

6. DETERMINATION

It is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation providing the conditions set forth in this determination are met.

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ACRONYMS & ABBREVIATIONS

AGL, Above Ground Level
AMSL, Above Mean Sea Level
ARP, Airport Reference Point
ARSR, Air Route Surveillance Radar
ARTCC, Air Route Traffic Control Center
ASN, Aeronautical Study Number
ASR, Airport Surveillance Radar
ATC, Air Traffic Control
ATCT, Air Traffic Control Tower
CARSR, Common Air Route Surveillance Radar
CAT, Category
CFR, Code of Federal Regulations
CG, Climb Gradient
DA, Decision Altitude
DME, Distance Measuring Equipment
FAA, Federal Aviation Administration
FUS, Fusion
GPS, Global Positioning System
IAF, Initial Approach Fix
IAP, Instrument Approach Procedure
ICA, Initial Climb Area
IFR, Instrument Flight Rules
INT, Intersection
LAT, Latitude
LNAV, Lateral Navigation
LOC, Localizer
LONG, Longitude
LP, Localizer Performance
LPV, Localizer Performance with Vertical Guidance
MDA, Minimum Descent Altitude
MEA, Minimum En route Altitude
MET, Meteorological Evaluation Tower
MIA, Minimum IFR Altitude
Min, Minimum
MOCA, Minimum Obstruction Clearance Altitude
MSA, Minimum Safe Altitude
MSL, Mean Sea Level
MVA, Minimum Vectoring Altitude
NA, Not Authorized
NAS, National Airspace System
NAVAID, Navigational Aid
NDB, Non-Directional Radio Beacon
NEH, No Effect Height
NM, Nautical Mile
NOTAM, Notice to Airmen
NPF, Notice of Preliminary Findings

OCS, Obstacle Clearance Surface
OE, Obstruction Evaluation
OEG, Obstruction Evaluation Group
Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace.
P-NOTAM, Permanent Notice to Airmen
RLOS, Radar Line of Sight
RNAV, Area Navigation
RNP, Required Navigation Performance
RWY, Runway
S-, Straight-in
SE, Site Elevation
S-LOC, Straight-in Localizer
SM, Statute Miles
Std., Standard
TAA, Terminal Arrival Area
TACAN, Tactical Air Navigation System
TERPS, Terminal Instrument Procedures
TPA, Traffic Pattern Airspace
TRACON, Terminal Radar Approach Control
V, Victor Airway
VFR, Visual Flight Rules
VHF, Very High Frequency
VOR, VHF Omnidirectional Radio Range System
VORTAC, VOR/TACAN System
WTE, Wind Turbine East
WTW, Wind Turbine West

Sectional Map for ASN 2022-WTE-601-OE