

# Appendix II-U1

Obstruction Evaluation & Airspace Analysis (OE/AA)

March 2024

# Atlantic Shores Offshore Wind Project – Lease Area OCS-A 0549

*Offshore Ocean County, New Jersey*

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*Obstruction Evaluation & Airspace Analysis*

March 24, 2022



Capitol Airspace Group

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## Summary

Capitol Airspace conducted an obstruction evaluation and airspace analysis for Atlantic Shores Offshore Wind, LLC (Atlantic Shores) off the coast of Ocean County, New Jersey. This assessment is a lease wide assessment of the Atlantic Shores Lease Area OCS-A 0549 (Lease Area of Project). The purpose of this analysis was to identify obstacle clearance surfaces established by the Federal Aviation Administration (FAA) that could limit the placement of 1,047-foot tall wind turbines. At the time of this analysis, 157 wind turbine locations had been identified (black points, [Figure 1](#)). This analysis assessed height constraints overlying each location as well as an approximately 127-square-mile study area (black outline, [Figure 1](#)) to aid in identifying optimal wind turbine locations.

The Bureau of Ocean Energy Management (BOEM) is responsible for regulating renewable energy activities on the outer continental shelf in accordance with 30 CFR Part 585. As part of the application process for leases, grants, and easements, BOEM may require the inclusion of an aeronautical study to determine the proposal's impact on airspace use and safety. If a project is determined to have an unacceptable impact on civil aviation or military activities, it could result in denial of the application.

14 CFR Part 77 applies to all structures within US territorial airspace. 14 CFR Part 77.9 requires that that all structures exceeding 200 feet AGL be submitted to the FAA so that an aeronautical study can be conducted. The FAA's objective in conducting aeronautical studies is to ensure that proposed structures do not affect the safety of air navigation or the efficient utilization of navigable airspace by aircraft. The result of an aeronautical study is the issuance of a determination of 'hazard' or 'no hazard' that can be used by the proponent to obtain necessary local construction permits. It should be noted that the FAA has no control over land use in the United States and cannot enforce the findings of its studies. For the portions of the Project that lie outside of U.S. territorial airspace and in BOEM jurisdiction, BOEM will consult with the FAA for airspace impacts.

The lowest obstacle clearance surfaces overlying the Atlantic Shores Lease Area range from 649 to 1,049 feet above mean sea level (AMSL) and are associated with multiple minimum vectoring altitude (MVA) sectors and a minimum instrument flight rules (IFR) altitude sector. Proposed wind turbines that exceed these surfaces would require an increase to MVAs and a minimum IFR altitude (MIA). If the FAA determines that these impacts would affect as few as one radar vectoring operation per week, it could result in determinations of hazard.

A warning area and multiple military training routes overlie the Atlantic Shores COP North offshore wind project and could result in military objections to proposed wind development.

This study did not consider electromagnetic interference on FAA communication or surveillance radar systems. Impact on these systems could be used as the basis for determinations of hazard regardless of the lack of impact on the physical airspace surfaces described in this report.

*Capitol Airspace applies FAA defined rules and regulations applicable to obstacle evaluation, instrument procedures assessment and visual flight rules (VFR) operations to the best of its ability and with the intent to provide the most accurate representation of limiting airspace surfaces as possible. Capitol Airspace maintains datasets obtained from the FAA which are updated on a 28-day cycle. The results of this analysis are based on the most recent data available as of the date of this report. Limiting airspace surfaces depicted in this report are subject to change due to FAA rule changes and regular procedure amendments. Therefore, it is of the utmost importance to obtain FAA determinations of no hazard prior to making substantial financial investments in this project.*



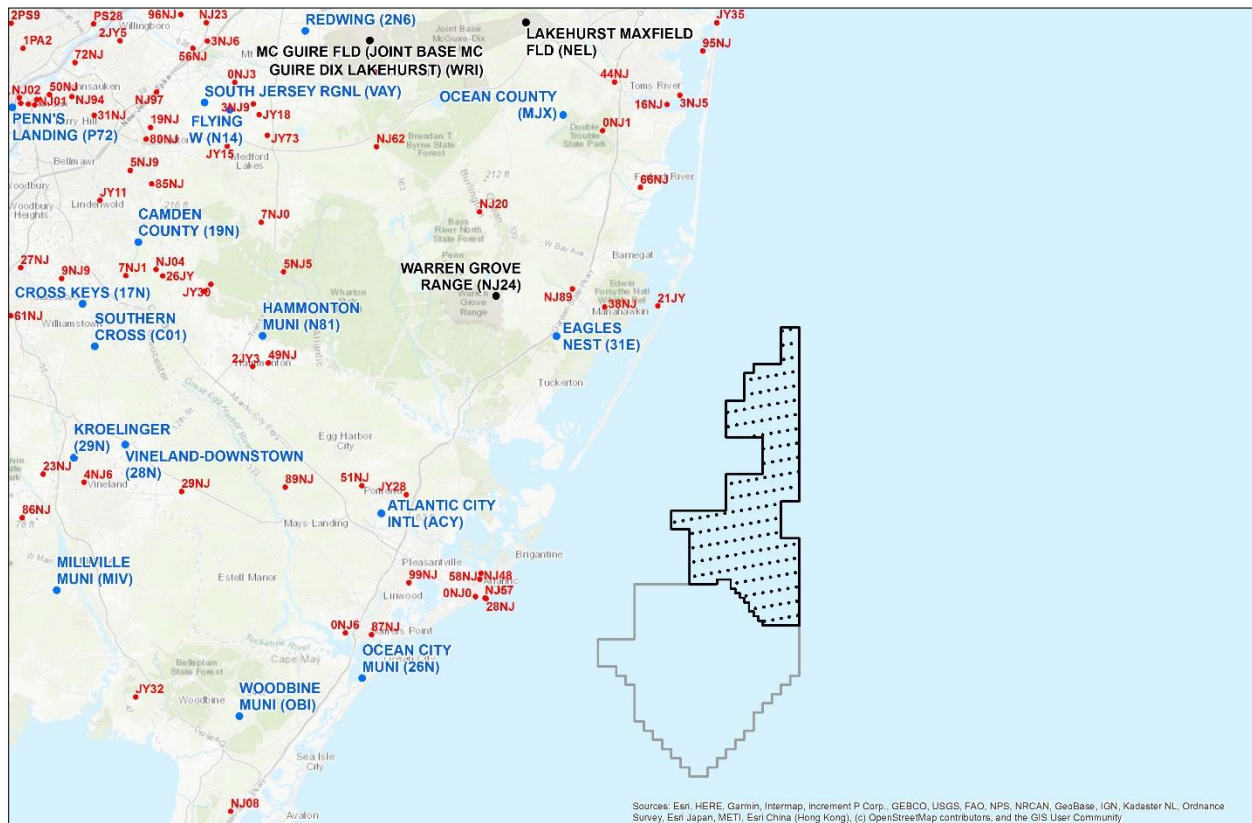


## Methodology

Capitol Airspace studied the proposed Project based on location information provided by Atlantic Shores. Using this information, Capitol Airspace generated graphical overlays to determine proximity to airports (**Figure 1**), published instrument procedures, enroute airways, FAA minimum vectoring altitude and minimum instrument flight rules (IFR) altitude charts, as well as military airspace and training routes.

Capitol Airspace evaluated all 14 CFR Part 77 imaginary surfaces, published instrument approach and departure procedures, visual flight rules operations, FAA minimum vectoring altitudes, minimum IFR altitudes, and enroute operations. All formulas, headings, altitudes, bearings and coordinates used during this study were derived from the following documents and data sources:

- 14 CFR Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace
- FAA Order 7400.2N Procedures for Handling Airspace Matters
- FAA Order 8260.3E United States Standard for Terminal Instrument Procedures
- FAA Order 8260.58B United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design
- Technical Operations Evaluation Desk Guide for Obstruction Evaluation/Airport Airspace Analysis (1.6.1)
- United States Government Flight Information Publication, US Terminal Procedures
- National Airspace System Resource Aeronautical Data



**Figure 1: Public-use (blue), private-use (red), and military (black) airports in proximity to the Atlantic Shores Lease Area OCS-A 0549 (grey)**

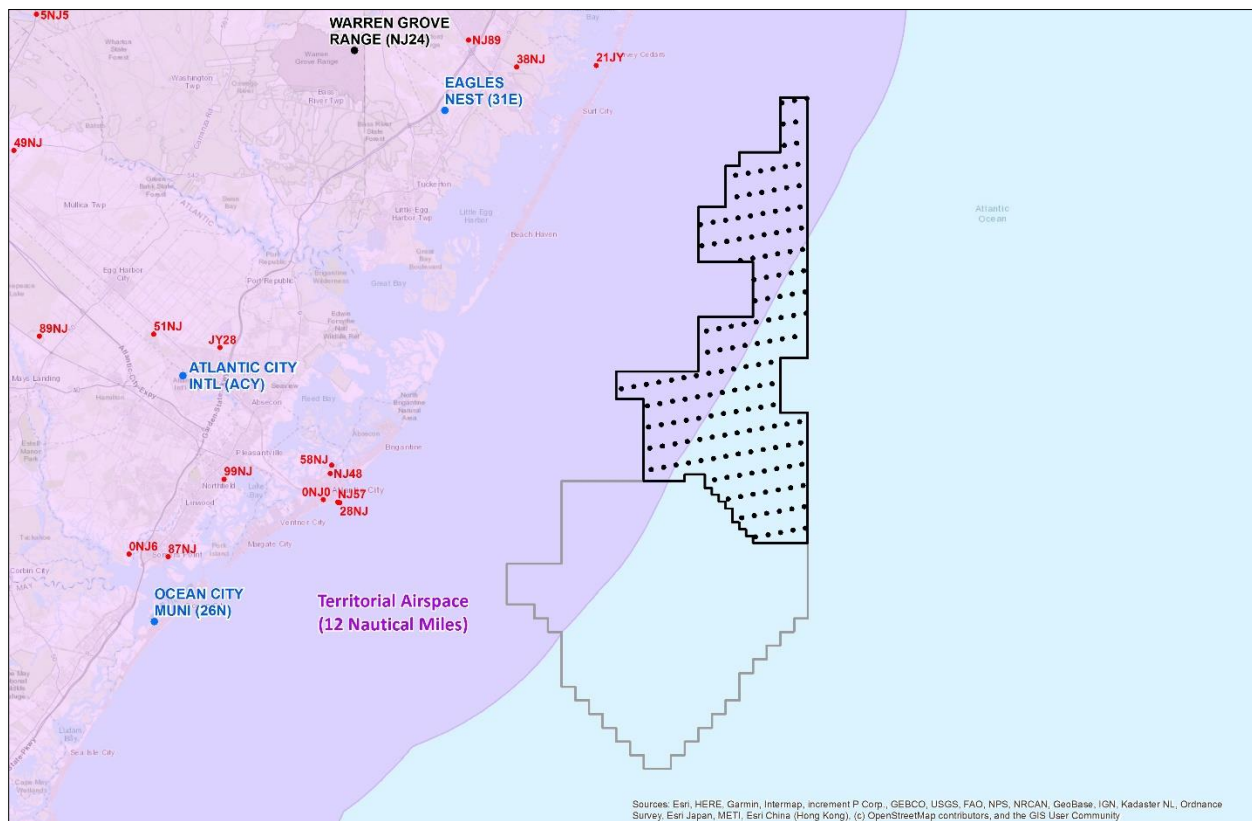


## Study Findings

### Territorial Airspace

The FAA conducts aeronautical studies for structures proposed within any state, territory, or possession of the United States, within the District of Columbia, or within territorial waters<sup>1</sup> surrounding the United States.<sup>2</sup> Although an offshore wind project may be located outside of territorial waters, BOEM may require an aeronautical study as part of the application process.

Proposed wind turbines in the northern, western, and central sections of the study area, including 83 proposed locations, will be located within territorial waters (shaded purple, **Figure 2**) and must be submitted to the FAA.



**Figure 2: Territorial airspace overlying the Atlantic Shores Lease Area**

<sup>1</sup> The National Oceanic and Atmospheric Administration (NOAA) defines territorial waters as 12 nautical miles measured from the official U.S. baseline – a recognized low water line along the coast. NOAA publishes this boundary in a publicly available [Web Map Service](#).

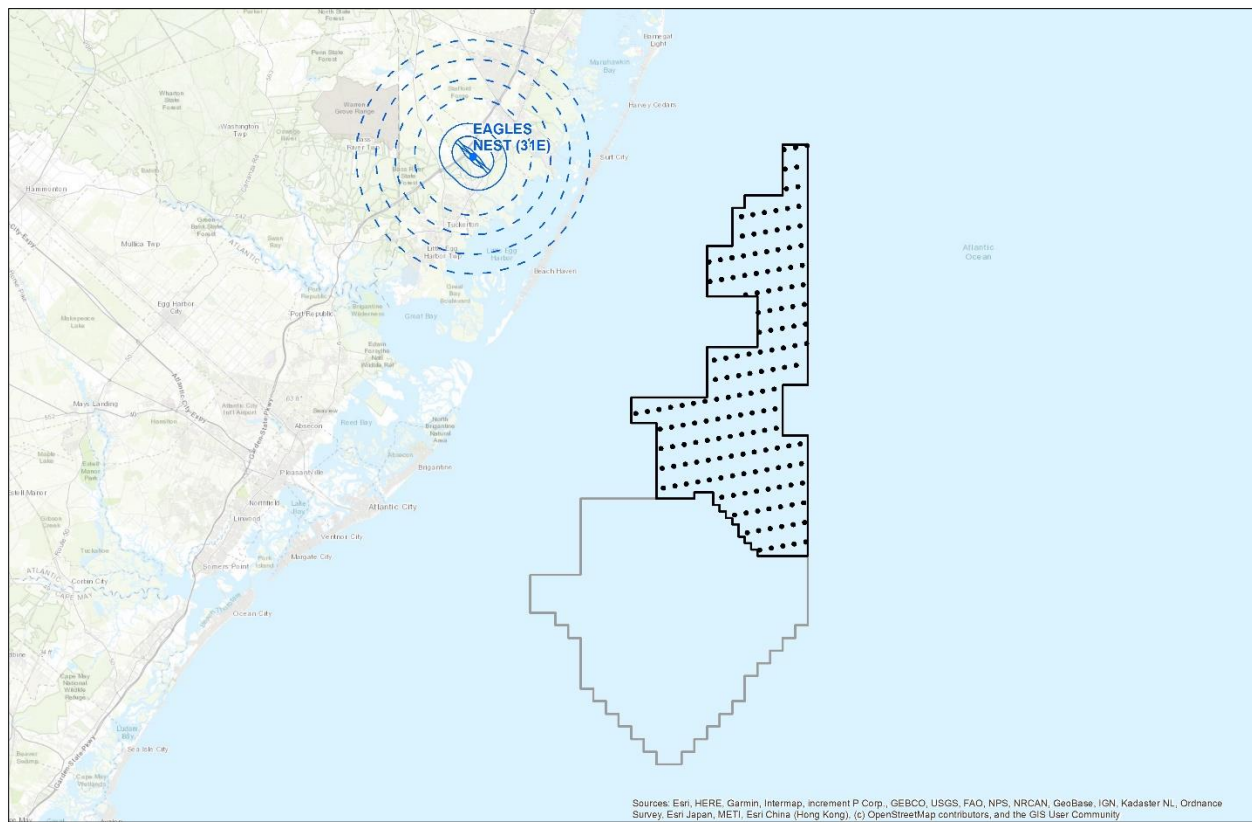
<sup>2</sup> As described in FAA Order 7400.2N 5-1-4(a) "Scope."



### 14 CFR Part 77.17(a)(2) Obstruction Standard and 77.19/21/23 Imaginary Surfaces

The FAA uses level and sloping imaginary surfaces to determine if a proposed structure is an obstruction to air navigation. Structures that are identified as obstructions are then subject to a full aeronautical study and increased scrutiny. However, exceeding a Part 77 imaginary surface does not automatically result in the issuance of a determination of hazard. Proposed structures must have airspace impacts that constitute a substantial adverse effect in order to warrant the issuance of determinations of hazard.

Military and public-use airport 14 CFR Part 77.17(a)(2) and 77.19/21/23 imaginary surfaces do not overlie the Atlantic Shores Lease Area (e.g., **Figure 3**). However, at 1,047 feet tall, wind turbines will exceed 77.17(a)(1) – a height of 499 feet AGL at the site of the object – and will be identified as obstructions regardless of location.



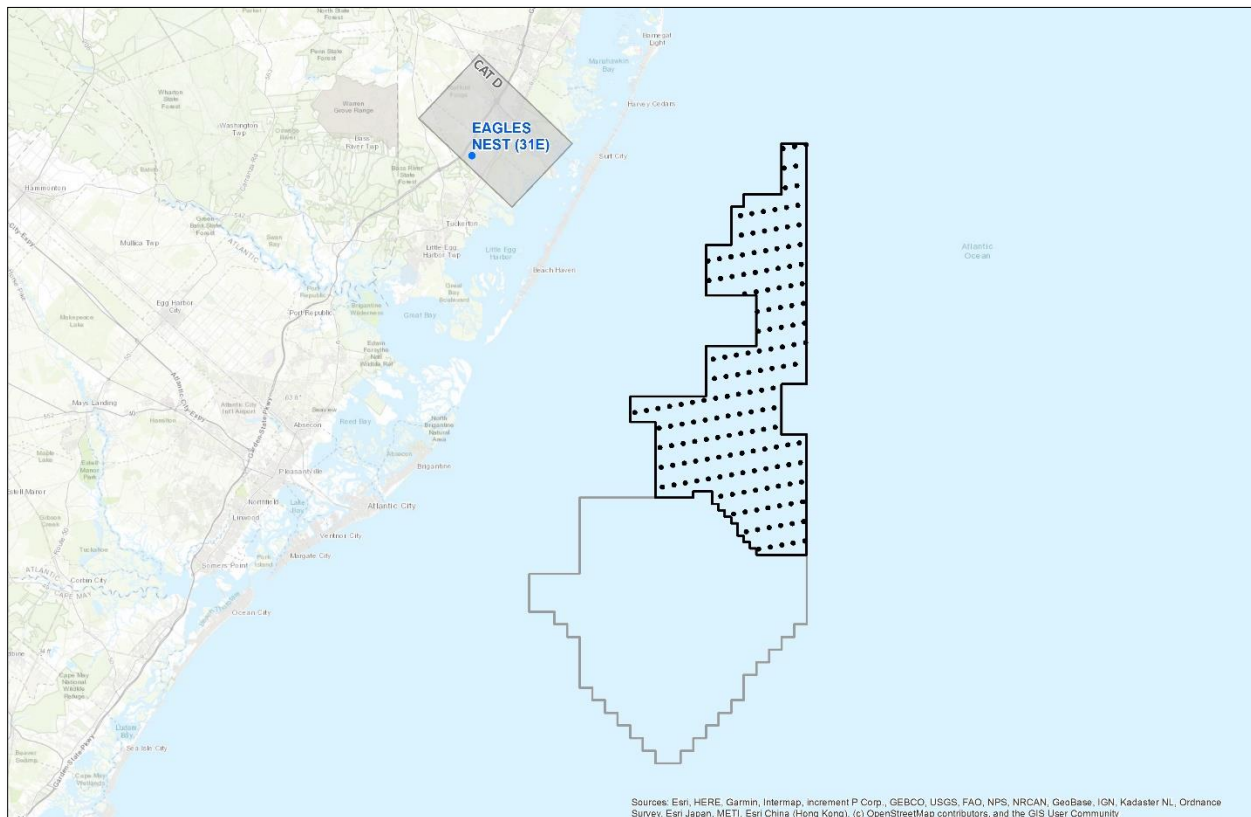
**Figure 3: 77.17(a)(2) obstruction standard (dashed blue) and 77.19 imaginary surfaces (solid blue)**



### Visual Flight Rules (VFR) Traffic Pattern Airspace

VFR traffic pattern airspace is used by pilots operating during visual meteorological conditions (VMC). The airspace dimensions are based upon the category of aircraft which, in turn, is based upon the approach speed of the aircraft. 14 CFR Part 77.17(a)(2) and 77.19 (as applied to a *visual* runway) imaginary surfaces establish the obstacle clearance surface heights within VFR traffic pattern airspace.

VFR traffic pattern airspace does not overlie the Atlantic Shores Lease Area and should not limit 1,047-foot tall wind turbines at any of the proposed locations ([Figure 4](#)).



**Figure 4: VFR traffic pattern airspace in proximity to the Atlantic Shores Lease Area**

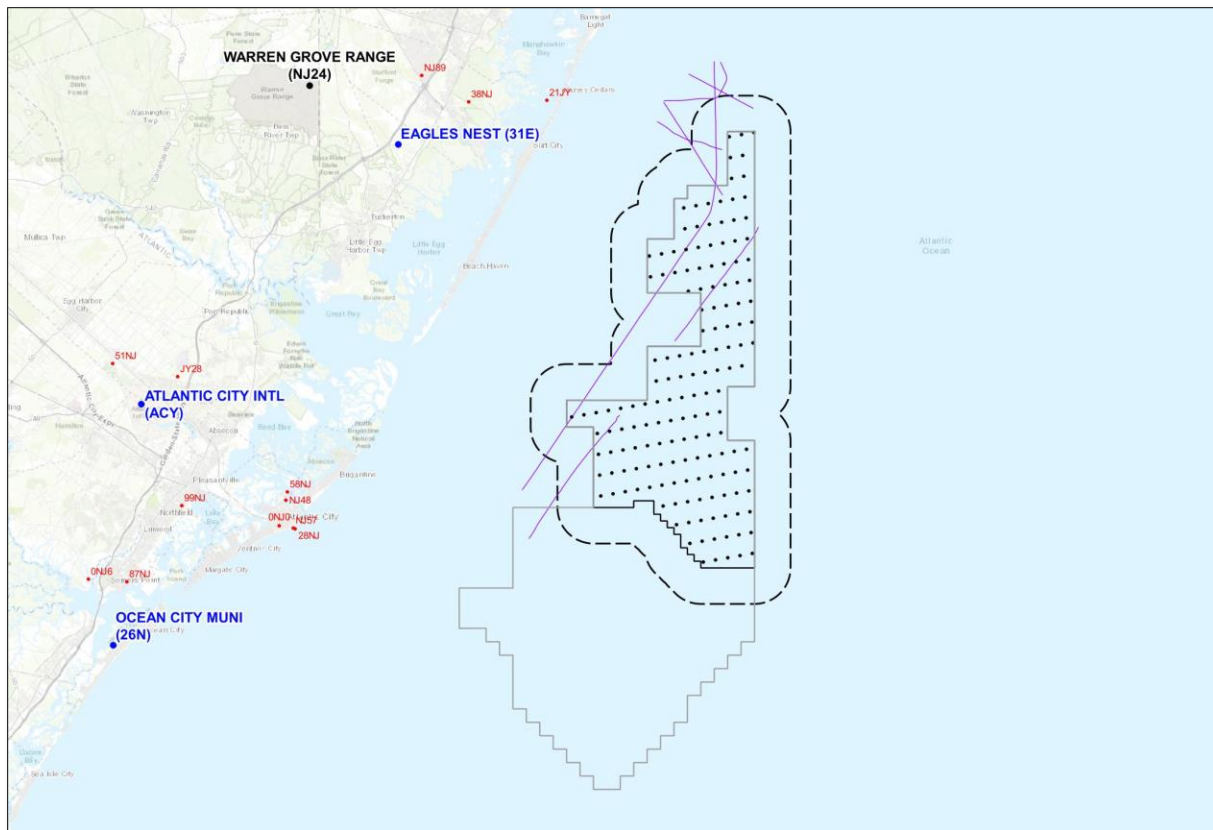




### Visual Flight Rules (VFR) Routes

During periods of marginal VMC – low cloud ceilings and one statute mile visibility – pilots often operate below the floor of controlled airspace. Operating under these weather conditions requires pilots to remain within one statute mile of recognizable landmarks such as roads, rivers, and railroad tracks. The FAA protects for known and regularly used<sup>3</sup> VFR routes by limiting structure heights within two statute miles of these routes to no greater than 14 CFR Part 77.17(a)(1) – a height of 499 feet AGL at the site of the object.

Historical air traffic data<sup>4</sup> indicates that 188 flights (*0.52 flights/day*) operated within two statute miles of the study area at low altitudes<sup>5</sup> (purple tracks, *Figure 5*). This frequency of operations is below the FAA’s threshold for a significant volume of operations (one flight per day). As a result, it is unlikely that proposed wind turbines in excess of 499 feet tall would have a substantial adverse effect on VFR routes.



**Figure 5: Historical flight tracks that operated at low altitudes within two-statute miles of the Atlantic Shores Lease Area**

<sup>3</sup> As few as one flight per day.

<sup>4</sup> FAA National Offload Program data for the 2020 calendar year. Only flights with a 1200 transponder code and ACY source were considered since this facility had the most complete radar coverage over the wind project.

<sup>5</sup> The lower altitude is 500 feet above the lowest ground elevation within two-statute miles of the wind project. The higher altitude is 500 feet above a hypothetical 1,047-foot-tall wind turbine placed on the highest ground elevation within two-statute miles of the wind project.



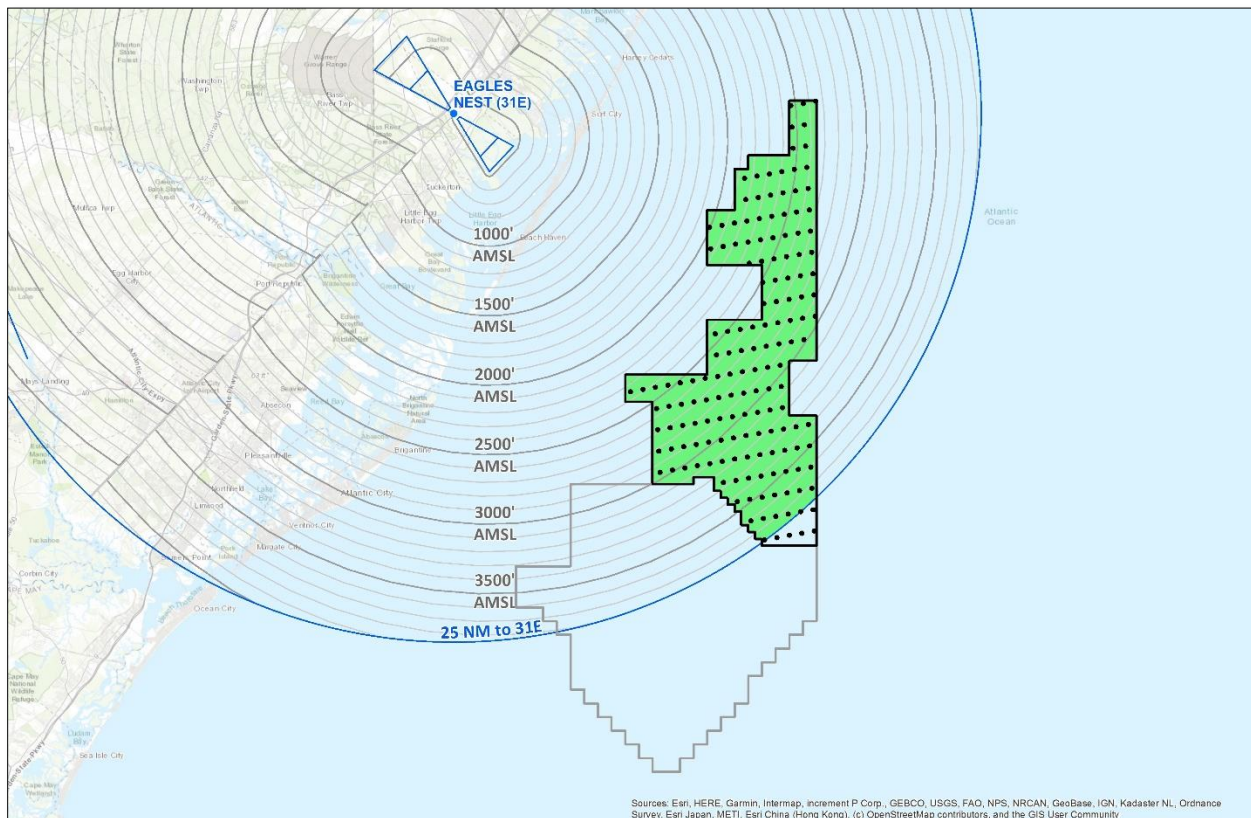


### Instrument Departures

In order to ensure that aircraft departing during marginal weather conditions do not fly into terrain or obstacles, the FAA publishes instrument departure procedures that provide obstacle clearance to pilots as they transition between the terminal and enroute environments. These procedures contain specific routing and minimum climb gradients to ensure clearance from terrain and obstacles.

Proposed structures that exceed instrument departure procedure obstacle clearance surfaces would require an increase to instrument departure procedure minimum climb gradients. If the FAA determines that this impact would affect as few as one operation per week, it could be used as the basis for determinations of hazard.

Instrument departure procedure obstacle clearance surfaces (e.g., **Figure 6**) are in excess of other, lower surfaces and should not limit 1,047-foot tall wind turbines at any of the proposed locations (green area, **Figure 6**).



**Figure 6: Eagles Nest (31E) obstacle departure procedure**



### Instrument Approaches

Pilots operating during periods of reduced visibility and low cloud ceilings rely on terrestrial and satellite based navigational aids (NAVAIDS) in order to navigate from one point to another and to locate runways. The FAA publishes instrument approach procedures that provide course guidance to on-board avionics that aid the pilot in locating the runway. Capitol Airspace assessed 35 published instrument approach procedures at six public-use airports in proximity to the Atlantic Shores Lease Area:<sup>6, 7</sup>

#### Atlantic City International (ACY)

- ASR Approach to Runway 04
- ASR Approach to Runway 22
- ASR Approach to Runway 13
- ASR Approach to Runway 31
- HI-ILS or Localizer Approach to Runway 13
- HI-ILS or Localizer Approach to Runway 31
- ILS or Localizer Approach to Runway 13
- ILS or Localizer Approach to Runway 31
- RNAV (RNP) Z Approach to Runway 13
- RNAV (RNP) Z Approach to Runway 31
- RNAV (GPS) Approach to Runway 04
- RNAV (GPS) Approach to Runway 22
- RNAV (GPS) Approach to Runway 13
- RNAV (GPS) Approach to Runway 31
- VOR/DME Approach to Runway 22
- VOR Approach to Runway 04
- VOR Approach to Runway 13
- VOR Approach to Runway 31
- COPTER ILS or LOC/DME Approach to Runway 13

#### Ocean City Municipal (26N)

- RNAV (GPS) Approach to Runway 06

#### Eagles Nest (31E)

- RNAV (GPS)-A Circling Approach
- RNAV (GPS)-B Circling Approach

#### Ocean County (MJX)

- ILS or Localizer Approach to Runway 06
- RNAV (GPS) Approach to Runway 06
- RNAV (GPS) Approach to Runway 24
- VOR Approach to Runway 06
- VOR Approach to Runway 24

#### Lakewood (N12)

- RNAV (GPS) Approach to Runway 06
- RNAV (GPS) Approach to Runway 24

#### Lakehurst Maxfield Field (NEL)

- RNAV (GPS) Approach to Runway 24
- RNAV (GPS) Approach to Runway 33
- VOR or VOR/DME or TACAN Y Approach to Runway 33
- TACAN Approach to Runway 24
- TACAN Z Approach to Runway 33
- NDB Approach to Runway 24

Proposed structures that exceed instrument approach procedure obstacle clearance surfaces would require an increase to their minimum altitudes. Increases to these altitudes, especially critical *decision altitudes (DA)* and *minimum descent altitudes (MDA)*, can directly impact the efficiency of instrument approach procedures. If the FAA determines this impact would affect as few as one operation per week, it could be used as the basis for determinations of hazard.

<sup>6</sup> Capitol Airspace assessed instrument approach procedures within 30 nautical miles (NM) of the study area. Although approach surfaces – including terminal arrival areas (TAA), feeder segments, and initial segments – from airports further than 30 NM may overlie the study area, the obstacle clearance surfaces present a lower risk to projects than the surfaces identified in this report. Therefore, height constraints associated with instrument approach surfaces for airports beyond 30 NM were not considered and are not included in the [Composite Map](#).

<sup>7</sup> Multiple minimum safe altitude (MSA) sectors overlie the study area. However, MSAs are for emergency use only and cannot be used as the basis for determinations of hazard in accordance with FAA Order 7400.2N Paragraph 6-3-9(e)(5). Therefore, height constraints associated with MSAs were not considered and are not included in the [Composite Map](#).



### **Atlantic City International (ACY)**

*ASR Approach to Runway 04*

*ASR Approach to Runway 22*

*ASR Approach to Runway 13*

*ASR Approach to Runway 31*

*HI-ILS or Localizer/DME Approach to Runway 13*

*HI-ILS or Localizer/DME Approach to Runway 31*

*ILS or Localizer/DME Approach to Runway 13*

*ILS or Localizer/DME Approach to Runway 31*

*VOR Approach to Runway 04*

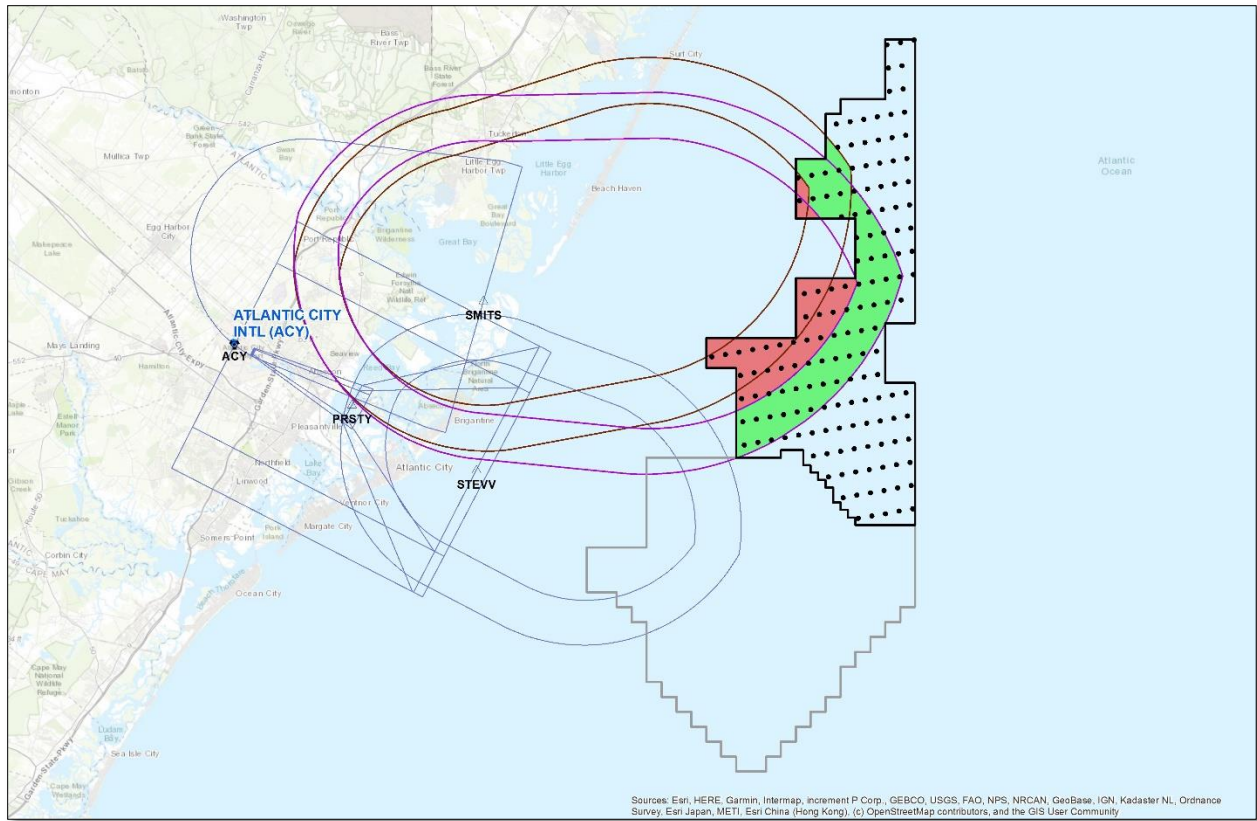
*RNAV (GPS) Approach to Runway 04*

*RNAV (GPS) Y Approach to Runway 13*

*RNAV (GPS) Y Approach to Runway 31*

*COPTER ILS or Localizer/DME Runway 13*

The SMITS 090° outbound course missed approach holding pattern and the 106° outbound course missed approach holding pattern minimum holding altitudes (MHA) are 2,000 feet AMSL. The primary area obstacle clearance surfaces (inner brown outline & inner purple outline, respectively, **Figure 7**) are 1,000 feet AMSL and are in excess of other, lower surfaces. These surfaces could still limit 1,047-foot tall wind turbines in the western section of the study area (red areas, **Figure 7**), including 26 proposed locations. However, the FAA may be willing to increase these MHAs to accommodate wind development up to 1,047 feet AMSL. This mitigation option is subject to FAA approval.



**Figure 7: Atlantic City International (ACY) Localizer/DME Approach to Runway 31**





### Enroute Airways

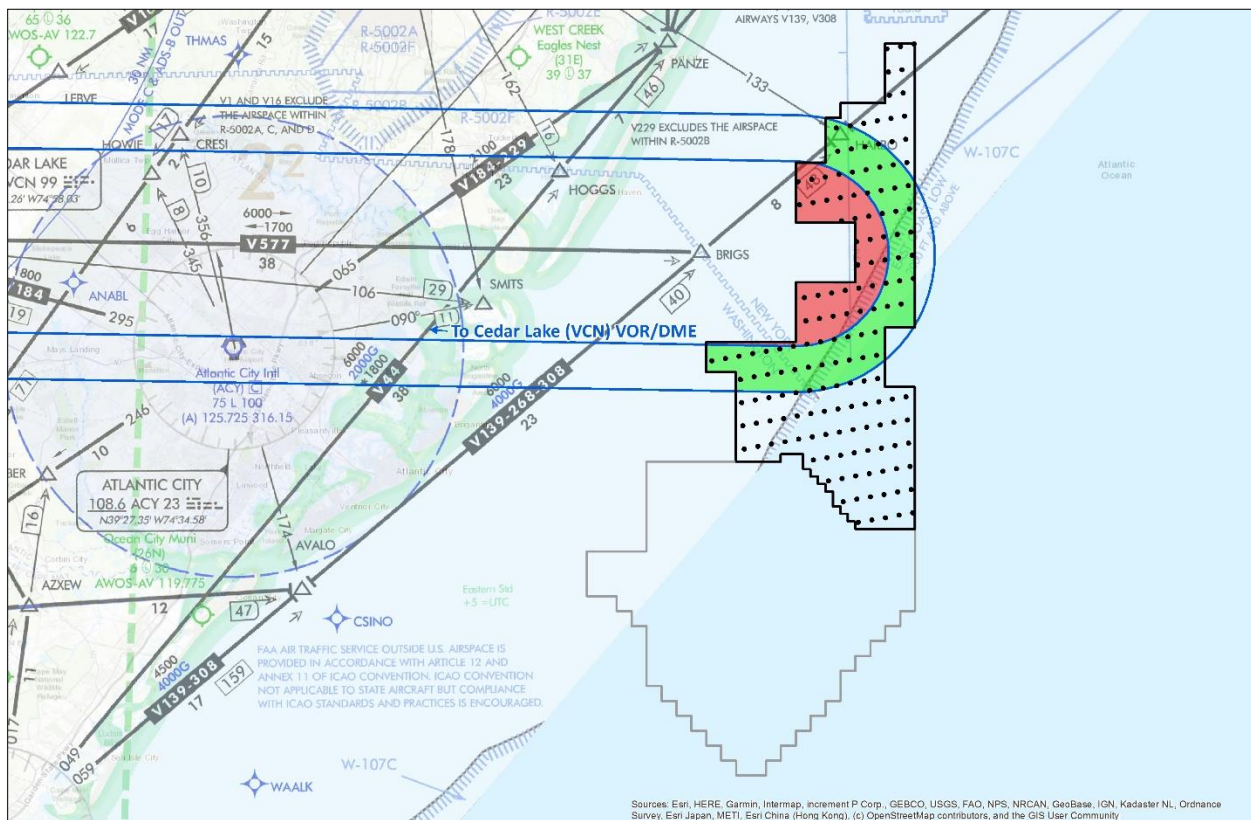
Enroute airways provide pilots a means of navigation when flying from airport to airport and are defined by radials between VHF omni-directional ranges (VORs). The FAA publishes minimum altitudes for airways to ensure clearance from obstacles and terrain. The FAA requires that each airway have a minimum obstacle clearance of 1,000 feet in non-mountainous areas and normally 2,000 feet in mountainous areas.

Proposed structures that exceed enroute airway obstacle clearance surfaces would require an increase to their minimum obstruction clearance altitudes (MOCA) and/or minimum enroute altitudes (MEA). If the FAA determines that this impact would affect as few as one operation per week, it could be used as the basis for determinations of hazard.

#### V577

*Cedar Lake (VCN) VOR/DME to BRIGS*

The directional MEA is 1,700 feet AMSL. The primary area obstacle clearance surface (inner blue outline, **Figure 8**) is 700 feet AMSL and is in excess of other, lower surfaces. However, this surface could still limit 1,047-foot tall wind turbines in the western section of the study area (red area, **Figure 8**), including 31 proposed locations.



**Figure 8: Low altitude chart L-34 with V577 obstacle evaluation areas (blue outline)**



### Minimum Vectoring/IFR Altitudes

The FAA publishes minimum vectoring altitude (MVA) and minimum instrument flight rules (IFR) altitude (MIA) charts that define sectors with the lowest altitudes at which air traffic controllers can issue radar vectors to aircraft based on obstacle clearance. The FAA requires that sectors have a minimum obstacle clearance of 1,000 feet in non-mountainous areas and normally 2,000 feet in mountainous areas.

Proposed structures that exceed MVA/MIA sector obstacle clearance surfaces would require an increase to the altitudes usable by air traffic control for vectoring aircraft. If the FAA determines that this impact would affect as few as one operation per week, it could result in determinations of hazard.

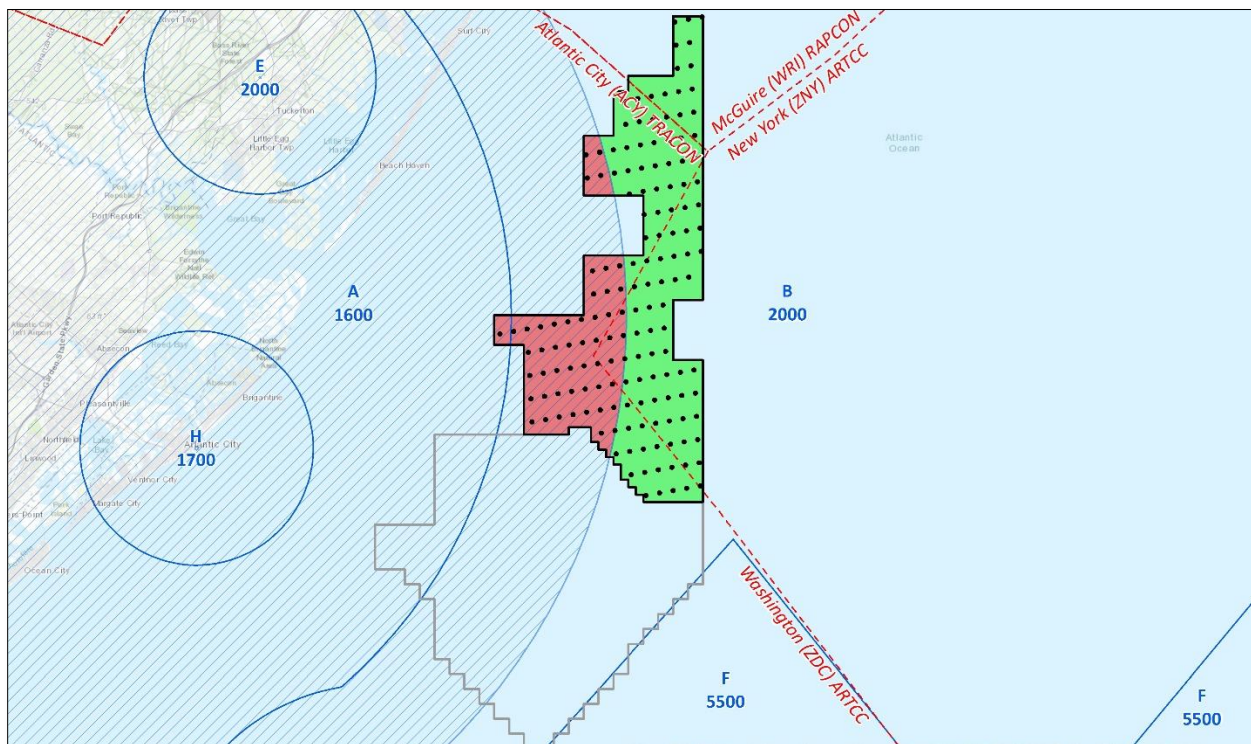
#### Atlantic City (ACY) Terminal Radar Approach Control (TRACON)

##### Sector A (ACY\_MVA\_FUS\_3\_2019 & ACY\_MVA\_FUS\_5\_2019)

The MVA is 1,600 feet AMSL. The obstacle clearance surface (hatched blue, [Figure 9](#)) is 649 feet AMSL and is one of the lowest height constraints overlying the western section of the study area. This surface could limit 1,047-foot tall wind turbines in this area (red area, [Figure 9](#)), including 51 proposed locations.

##### Sector B (ACY\_MVA\_FUS\_3\_2019 & ACY\_MVA\_FUS\_5\_2019)

The MVA is 2,000 feet AMSL. The obstacle clearance surface is 1,049 feet AMSL and is one of the lowest height constraints overlying the southeastern section of the study area. However, this surface should not limit 1,047-foot tall wind turbines at any of the proposed locations (green area, [Figure 9](#)).



**Figure 9: Atlantic City (ACY) TRACON FUSION 5 MVA sectors (blue) with Sector A obstacle evaluation area (hatched blue)**

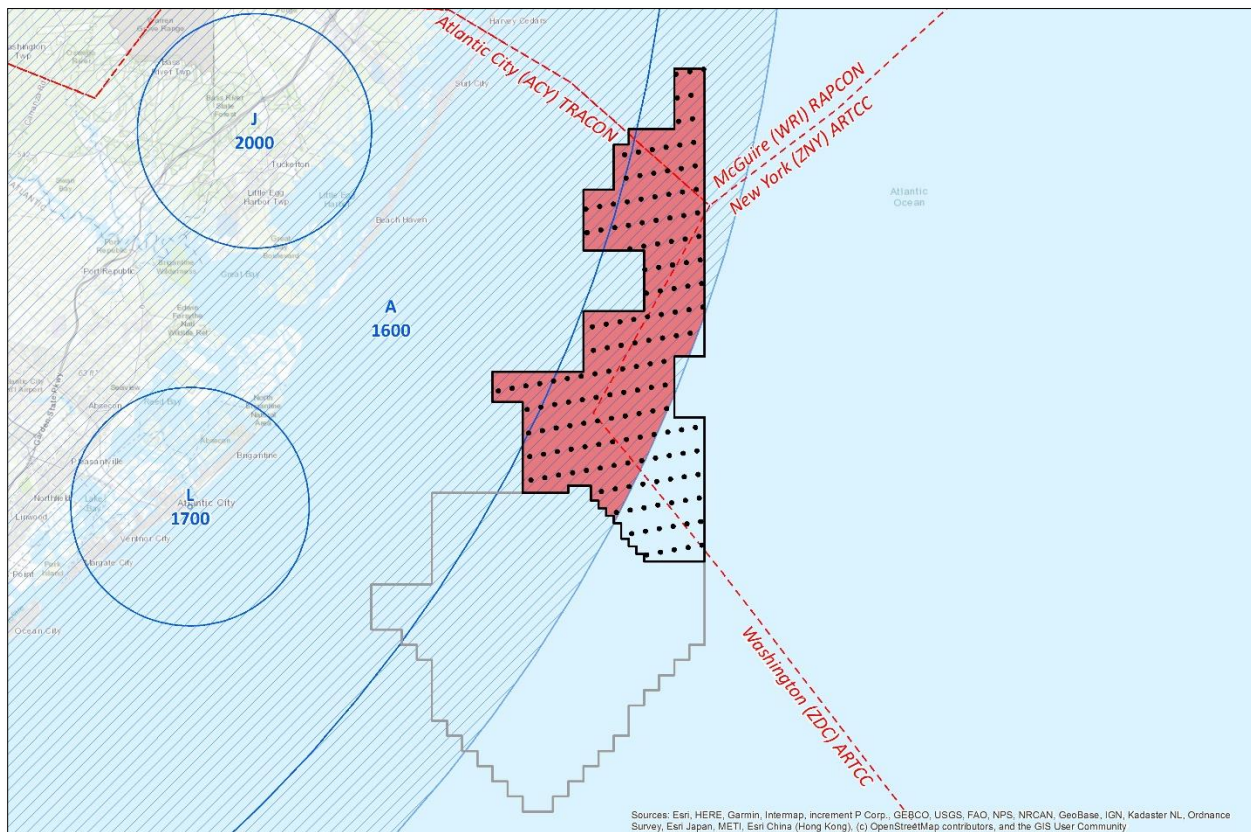




### Philadelphia (PHL) TRACON

*Sector A (PHL\_MVA\_FUS3\_2020 & PHL\_MVA\_FUS5\_2020)*

The MVA is 1,600 feet AMSL. The obstacle clearance surface is 649 feet AMSL (hatched blue, **Figure 10**) and is one of the lowest height constraints overlying the northern, western, and central sections of the study area. This surface could limit 1,047-foot tall wind turbines in this area (red area, **Figure 10**), including 128 proposed locations. However, the Atlantic Shores COP North offshore wind project is located more than 40 nautical miles (NM) outside of Philadelphia (PHL) TRACON airspace. Therefore, Philadelphia (PHL) TRACON may be willing to raise the Sector A MVA where it overlies the study area. This mitigation option is subject to FAA approval.



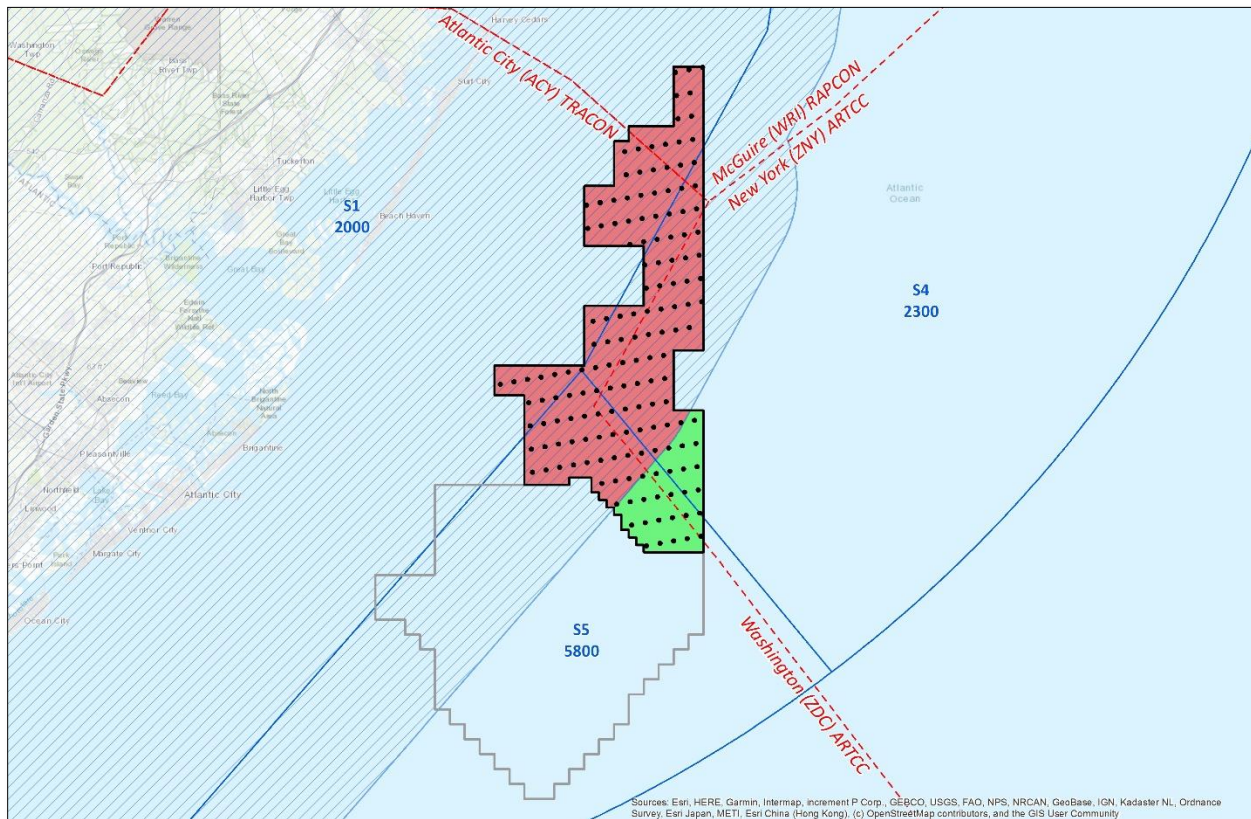
**Figure 10: Philadelphia (PHL) TRACON FUSION 5 MVA sectors (blue) with Sector A obstacle evaluation area (hatched blue)**



### McGuire (WRI) Radar Approach Control (RAPCON)<sup>8</sup>

#### Sector 1 (MVAC Terminal)

The MVA is 2,000 feet AMSL. The obstacle clearance surface (hatched blue, **Figure 11**) is 1,000 feet AMSL and is the lowest height constraint overlying a small eastern section of the study area. This surface could limit 1,047-foot tall wind turbines in this area (red area, **Figure 11**), including 131 proposed locations.



**Figure 11: McGuire (WRI) RAPCON MVAC sectors (blue) with Sector 1 (hatched blue) obstacle evaluation areas**

<sup>8</sup> Department of Defense (DoD) radar vectoring charts, including those for Navy and Air Force Radar Approach Control (RAPCON) facilities, Navy Radar Air Traffic Control Facilities (RATCF), and Army Radar Approach Control Facilities (ARAC) are not publicly released. McGuire (WRI) RAPCON sectors overlie the Atlantic Shores COP North study area. Therefore, Capitol Airspace requested their chart and assessed for impacts to their MVA sectors. However, unreleased or updated charts could result in lower height constraints than those depicted in this report.

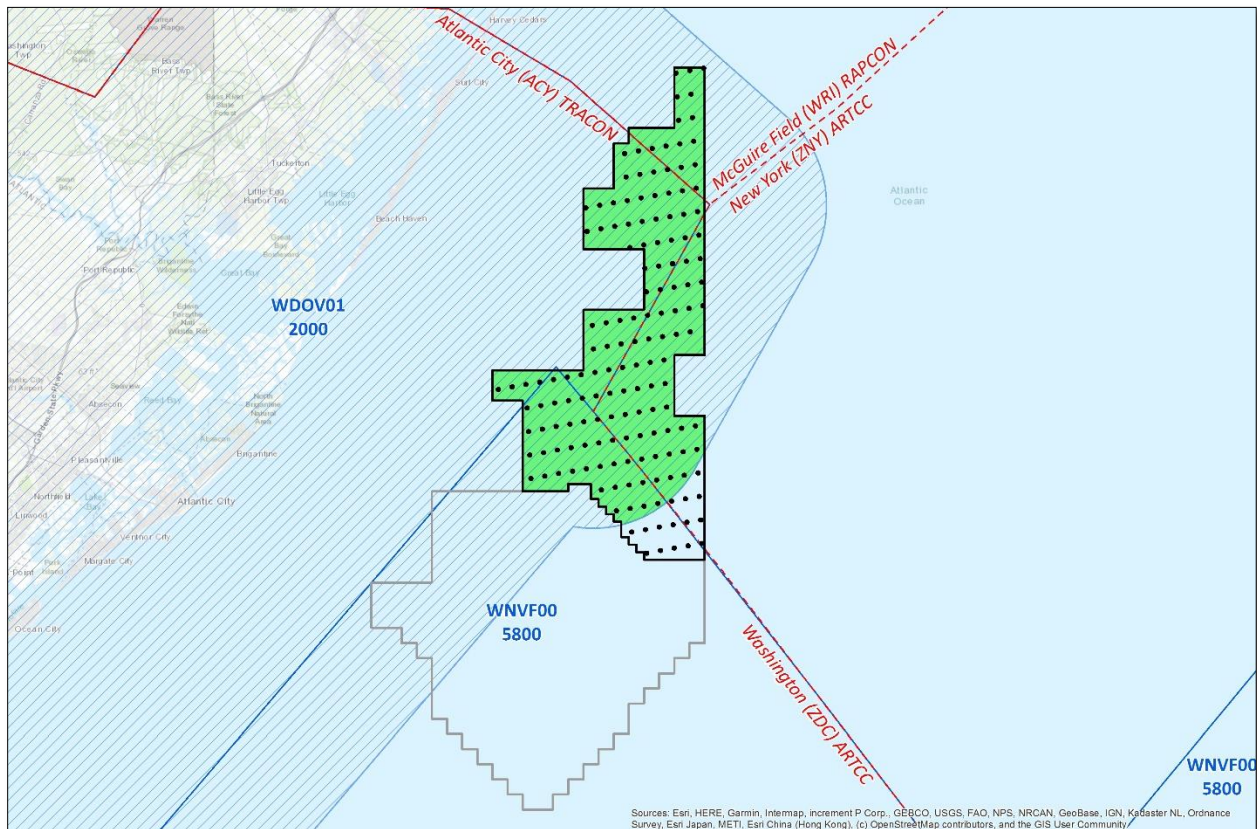




### Washington (ZDC) Air Route Traffic Control Center (ARTCC)

*Sector WDOV01 (ZDC\_TAV\_2020)*

The MIA is 2,000 feet AMSL. The obstacle clearance surface is 1,049 feet AMSL (hatched blue, **Figure 10**) and is one of the lowest height constraints overlying the southeastern section of the study area. However, this surface should not limit 1,047-foot tall wind turbines at any of the proposed locations (green area, **Figure 10**).



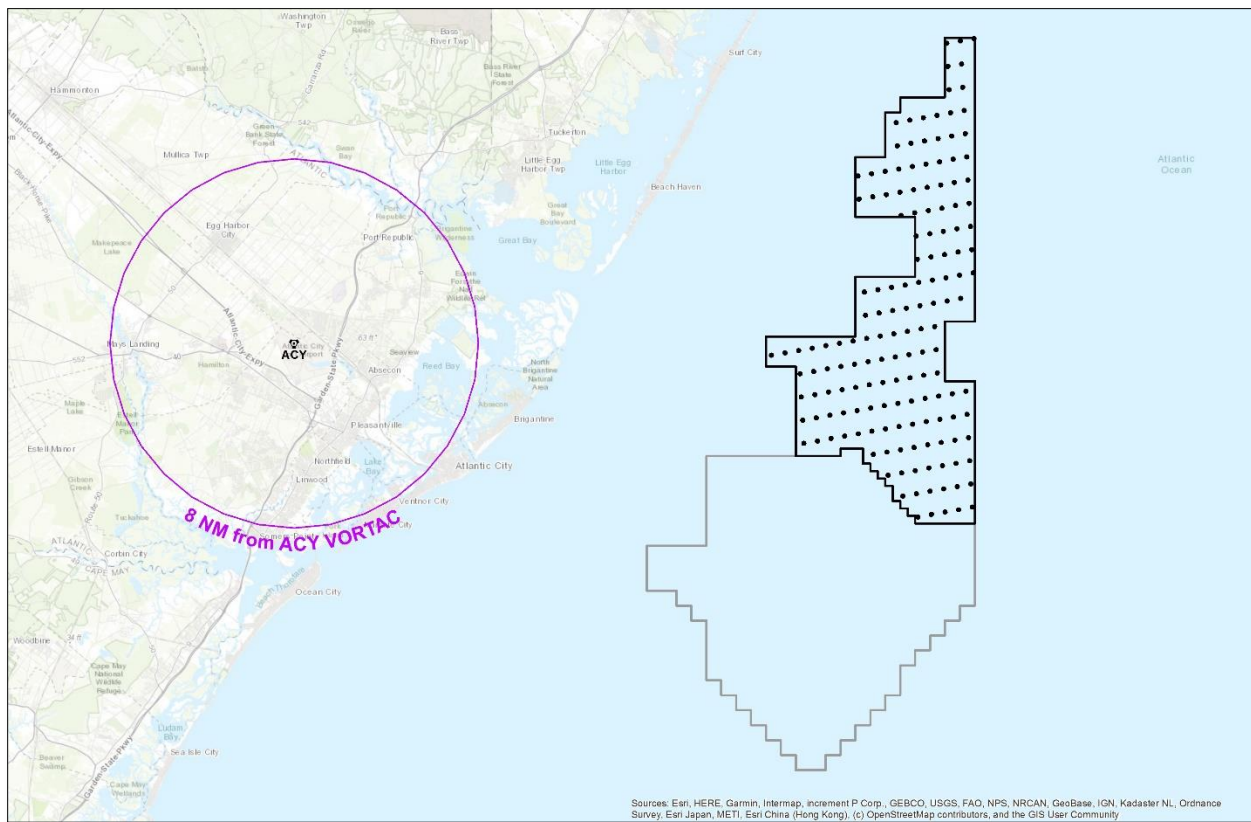
**Figure 12: Washington (ZDC) ARTCC sectors (blue) with Sector WDOV01 obstacle evaluation area (hatched blue)**



### Terminal and Enroute Navigational Aids

The FAA has established protection areas in order to identify proposed structures that may have a physical and/or electromagnetic effect on navigational aids (NAVAIDs). The protection area dimensions vary based on the proposed structure type as well as the NAVAID type. Proposed structures located within these areas may interfere with NAVAID services and will require further review by FAA Technical Operations. If further review determines that proposed structures would have a significant physical and/or electromagnetic effect on NAVAIDs, it could result in determinations of hazard.

NAVAID protection areas do not overlie the Atlantic Shores Lease Area (*Figure 13*). As a result, it is unlikely that proposed wind turbines would have a physical or electromagnetic effect on terminal or enroute NAVAIDs.



*Figure 13: NAVAID protection areas in proximity to the Atlantic Shores Lease Area*



### Military Airspace and Training Routes

Although the FAA does not consider impact on military airspace or training routes, they will notify the military of proposed structures located within these segments of airspace. Impact on these segments of airspace can result in military objections to the proposed development. If the planned development area is located on federal land, impact on military airspace or training routes may result in the denial of permits by BOEM.

Warning areas (W), slow speed low attitude training routes (SR), and VFR military training routes (VR) overlying the Atlantic Shores COP North offshore wind project ([Figure 14](#)):

#### U.S. Navy, Fleet Area Control and Surveillance Facility, Virginia Capes (FACSFAC VACAPES)

<i>Route/Airspace</i>	<i>Minimum Altitude</i>
W-107C	Surface

#### 177<sup>th</sup> Fighter Wing, New Jersey Air National Guard (ANG), Warren Grove Range, NJ

<i>Route/Airspace</i>	<i>Minimum Altitude</i>
VR-1709	100 feet Above Ground Level (AGL)

#### 166<sup>th</sup> Airlift Wing, Delaware Air National Guard (DEANG), New Castle, DE

<i>Route/Airspace</i>	<i>Minimum Altitude</i>
SR-846	500 feet AGL

Due to the low altitudes associated with this segment of airspace, wind development could have an impact on its operations. If FACSFAC, Warren Grove, 166<sup>th</sup> AW DEANG or other nearby units use this segment of airspace regularly, they may object to proposed wind development within the boundaries.

Under the provisions of the 2018 National Defense Authorization Act (NDAA), the Military Aviation and Installation Assurance Siting Clearinghouse (Clearinghouse) may issue a Notice of Presumed Risk to National Security (NPR) letter to initiate mitigation discussions. These discussions are facilitated through the Clearinghouse and with the affected bases or organizations with operational interests. Per the legislative directive, NPR letters are provided to the Governor of the State(s). The Clearinghouse typically attempts to notify developers shortly before the issuance of an NPR letter.

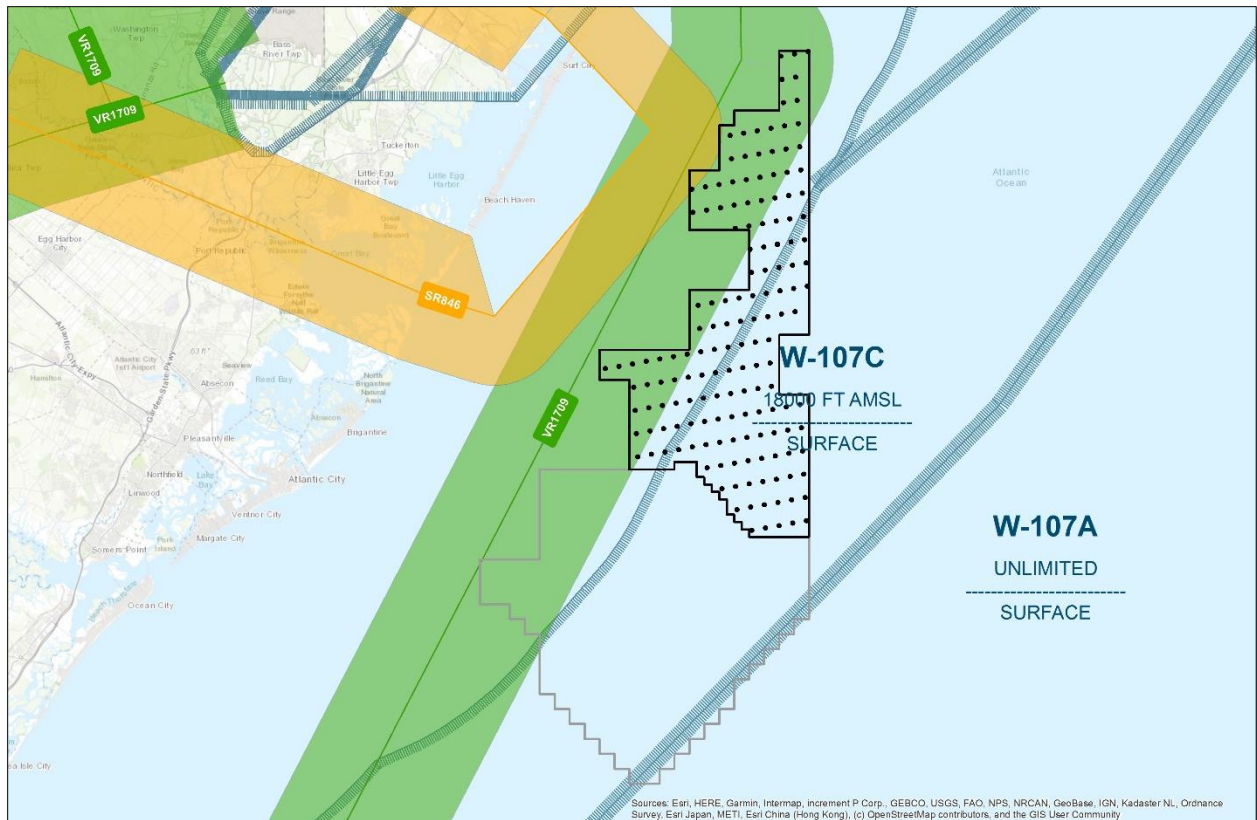


Figure 14: Military airspace and training routes overlying the Atlantic Shores Lease Area





## Conclusion

At 1,047 feet tall, wind turbines throughout the proposed study area will exceed 14 CFR Part 77.17(a)(1) – a height of 499 feet AGL at the site of the object – and will be identified as obstructions regardless of their location. However, heights in excess of 499 feet AGL are feasible provided proposed wind turbines do not exceed FAA obstacle clearance surfaces.

The lowest obstacle clearance surfaces overlying the Atlantic Shores Lease Area range from 649 to 1,049 feet AMSL (**Figure 15**) and are associated with multiple MVA and MIA sectors. These surfaces could limit 1,047-foot tall wind turbines throughout the northern, western, and central sections of the study area (red area, **Figure 16**).

At 1,047 feet tall, proposed wind turbines in the western section of the study area (red areas, **Figure 7** & **Figure 10**) will require an increase to the Atlantic City (ACY) *SMITS* missed approach MHAs corresponding to multiple instrument approach procedures. However, the FAA may be willing to increase these MHAs to accommodate wind development up to 1,047 feet tall. Additionally, proposed wind turbines throughout the northern, western, and central sections of the study area would require an increase to Philadelphia (PHL) TRACON MVA sectors. However, the Atlantic Shores COP North wind project is located more than 40 NM outside Philadelphia (PHL) TRACON airspace. Therefore, this facility may be willing to raise their sector MVA where it overlies the study area. These mitigation options are subject to FAA approval.

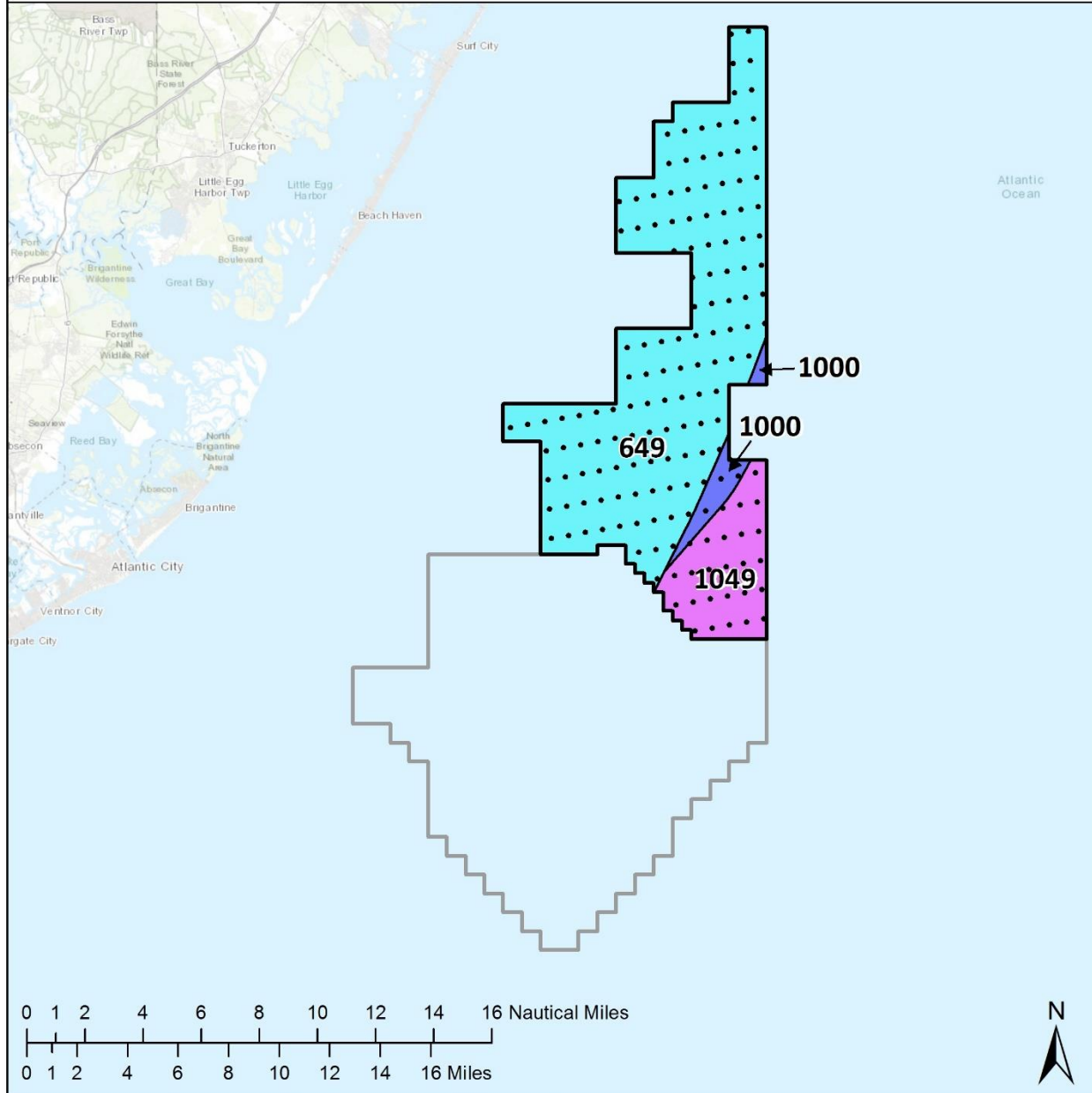
At 1,047 feet tall, proposed wind turbines in the northern, western, and central sections of the study area (red areas, **Figure 8**, **Figure 9**, & **Figure 11**) would require an increase to the enroute airway V577 MEA, multiple Atlantic City (ACY) TRACON MVAs, and a McGuire (WRI) RAPCON MVA. If the FAA determines that any of these impacts would affect as few as one operation per week, it could be used as the basis for determinations of hazard.

A warning area and multiple military training routes overlie the Atlantic Shores Lease Area (**Figure 14**) and could result in military objections to proposed wind development.

If you have any questions regarding the findings of this study, please contact **Dan Underwood** or **Alison Kennedy** at (703) 256-2485.






Proposed structures that exceed 14 CFR Part 77.17(a)(1) - a height of 499 feet AGL at the site of the object - will be identified as obstructions regardless of location.



**Obstacle Clearance Surface**

**Height - AMSL Feet**

-  649
-  1,000
-  1,049

 Lease Area

- Proposed Wind Turbines

All heights above mean sea level (AMSL)

**Atlantic Shores COP North Offshore Wind Project**  
Composite Height Constraint Map

**Plot Date:**  
24 March 2022

**Figure 15**

**Coordinate System:**  
NAD 1983 UTM Zone 18N

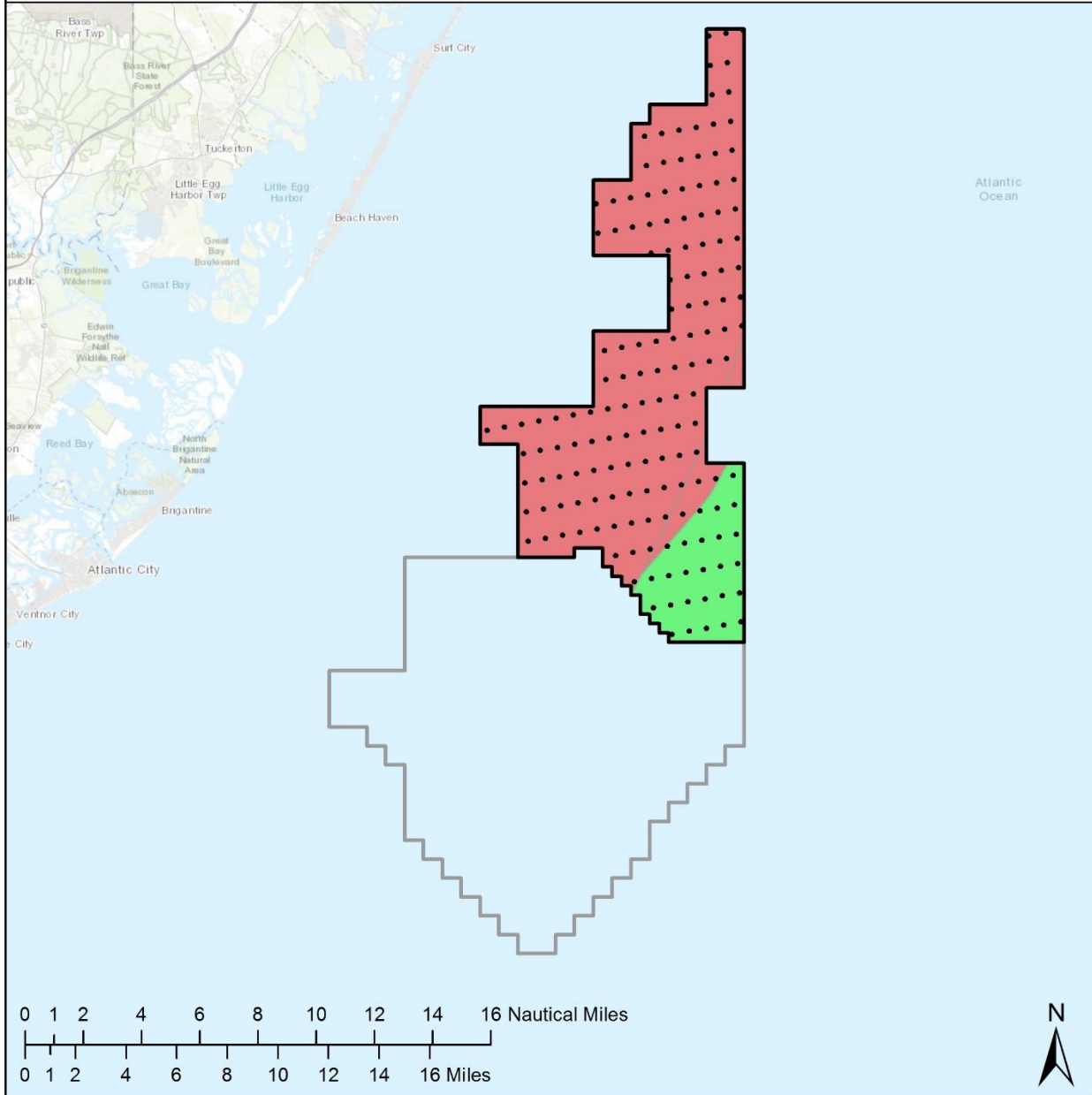
Alison Kennedy



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Proposed structures that exceed 14 CFR Part 77.17(a)(1) - a height of 499 feet AGL at the site of the object - will be identified as obstructions regardless of location.



**Clearance**

Height - AMSL Feet

 < 1,047

 ≥ 1,047

 Lease Area

-  Proposed Wind Turbines

**Atlantic Shores COP North Offshore Wind Project**  
Above Mean Sea Level (AMSL) Clearance Map

**Plot Date:**  
24 March 2022

**Figure 16**

**Coordinate System:**  
NAD 1983 UTM Zone 18N

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All heights above mean sea level (AMSL)