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April 18, 2023

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Re: South Coast Wind Draft Environmental Impact Statement, Finding of Adverse Effect, Technical Reports, and Proposed Memorandum of Agreement
Docket No. BOEM-2023-0011

Dear Ms. Baker and Ms. Crawford:

The Nantucket Maria Mitchell Association (“MMA”) appreciates the opportunity to make public comment and to participate in the process as a consulting party, and we look forward to BOEM and others reaching out to us in the future to try to address some of the concerns that we have. To summarize: we believe that the joint NEPA and 106 analyses should identify the adverse effects on MMA and others in a similar position to MMA; analyze those effects; and identify the steps taken in consultation with MMA and others to try to find acceptable mitigations to those adverse effects. MMA respectfully submits that the process so far has not done these things. For example, to MMA’s knowledge, no consideration has been given to the historic use of MMA’s observatory and other properties, the observation by MMA members and others of the stars and of dark skies generally from all locations within the relevant geographical area, or the economic impact of the proposals on MMA and other similarly situated parties. In addition, the brief consideration that is given to nighttime visual effects on the horizon raises significant questions and concerns both with regard to its methodology and with regard to its proposed conclusions. Finally, MMA is concerned and objects to the process by which the consideration of the project has proceeded to date. Below we discuss each of these three concerns in more detail, after initially providing some additional background relating to MMA and to dark skies generally.

I. MMA and Its Mission Relating to Dark Skies and Other Matters

A. The Nantucket Maria Mitchell Association

MMA was founded in 1902 to honor the legacy of Maria Mitchell, America's first female astronomer. Mitchell grew up on Vestal Street, one of 10 children, a Quaker, and worked alongside her father observing the night sky. In 1847, she discovered a comet from the roof top of the Pacific National Bank that still stands at the top of Main Street. She was awarded a medal from the King of Denmark, became the first woman admitted to the Academy of Arts and Sciences in 1848, and became the first professor and the first female professor at Vassar College. Since the inception of the MMA, there have been many notable women astronomers associated with MMA, including Annie Jump Cannon and Margaret Harwood, both from Harvard University. Interns started coming to MMA in 1914 to do research projects and observe the night sky. This longstanding tradition is still in place today, funded in large part by the National Science Foundation (NSF). This year we had over 300 applications for 6 NSF-REU (Research Experiences for Undergraduates) internships in astronomy, where undergraduate students from across the country come to Nantucket to complete individual research projects. These research projects are then presented at the Annual American Astronomical Society meeting, the largest gathering of professional astronomers in the United States. This past year one of the interns received the Chambliss Award, an award an MMA intern has won many times previously. Of the approximately 3,000 female astronomers today, one in every 20 had a formative experience as an astronomy intern at MMA here on Nantucket. Our organization is the second oldest non-profit on the island and our role is to inspire curiosity, offer hands-on-learning and create connection to the natural world through the land, sea, and sky. We host over 20,000 visitors a year and offer over 550 programs, and our discovery camps provide that connection to nature to over 400 children.

Nantucket Island was added to the National Register of Historic Places over fifty years ago. The designation recognizes the island's rich history and the well-preserved examples of colonial architecture that can still be found there today. The historic district encompasses the entire island, which played an important role in the whaling industry during the 18th and 19th centuries. The district also includes several other important landmarks, such as the Nantucket Atheneum (a historic library), the Unitarian Universalist Meeting House (built in 1809), and the Maria Mitchell Observatory and House. The Nantucket Historic District is a popular destination for tourists who are interested in exploring the island's history and architecture. The Maria Mitchell Observatory and House, located at One Vestal Street in Nantucket are part of the historical district. The Observatory was built in 1908 and is named after Maria Mitchell, an American astronomer who discovered a comet in 1847 and was the first female astronomy are part of the historic district. The house next to the Observatory was the birthplace and childhood home of Maria Mitchell. The entire property is known as the Maria Mitchell Association, and it serves as an educational and scientific organization that promotes astronomy, natural science, and local history.

B. Importance of Dark Skies Generally and to Nantucket Specifically

Dark skies are critical to our work in observation of the galaxy. We are actively conducting research via direct observation year-round, and we offer programming to the community for learning and observing the night sky. Last year we had more than 3,000 visitors to the Loines Observatory and offered 20 Open Nights at the Observatory for free to the local community (parents, children, and educators) through our grant funded "Look Up" program. Our goal is that every child growing up on Nantucket looks through our telescopes and sees Jupiter or Saturn, views the Milky Way, and understands the importance of this special natural resource – dark skies – and humanity's responsibility to protect it.

C. Interactions with Dark Skies

MMA and its stakeholders interact with the dark skies daily and have done so historically for over 100 years as part of the traditional historical use of MMA's properties and otherwise. For example, currently, our

director of astronomy, our telescope technician, 6 REU students and 2 post baccalaureate research fellows are using the observatories year-round to collect data and conduct astrophysical research. This research is funded by the NSF through competitive grants that we have received for many years. This research encompasses a wide variety of topics including variable stars, dwarf galaxies, quasars, galaxy formation and evolution, and the newly discovered, enigmatic, and fast radio bursts. For many years now, numerous other Nantucket residents and visitors to Nantucket, as a result of MMA or on their own, participate in observational activities of this sort as well, in furtherance of MMA's longstanding mission.

D. Sensitivity of Dark Skies

The notion of dark skies is straightforward: most projected light brightens the skies, termed *skyglow*, and interferes with the observation of the stars and other celestial objects. This affects not only professional astronomers but everyone who wishes to look up and learn from the constellations, planets, and our own Milky Way galaxy, in furtherance of MMA's mission. There are well recognized and scientifically established ways of identifying which kinds of lighting and what kinds of variables with respect to lighting have the greatest deleterious effect on dark skies.

1. "Artificial Light at Night: State of the Science 2022" by the International Dark-Sky Association (DOI: 10.5281/zenodo.6903500) contains a review summarizing the current state of knowledge about the impact of artificial lighting on the night sky. Complete with long listing of scientific literature about this topic.

2. "Assessing the impact of artificial light at night on biodiversity across latitude – Current knowledge gaps and future directions" by Pape's, Monica and Whitman, Andrew. This article, published in the journal *Global Ecology and Conservation* in 2021, provides an overview of the current state of knowledge about the impact of artificial light on biodiversity across different latitudes. The authors discuss various variables that can affect the impact of light pollution on ecosystems, including the intensity, spectrum, and duration of artificial light.

3. "A framework for understanding the ecological effects of nighttime light pollution" by Longcore, Travis and Rich, Catherine. This article, published in the journal *Frontiers in Ecology and the Environment* in 2019, outlines a framework for understanding the ecological effects of nighttime light pollution. The authors emphasize the importance of considering both the intensity and spectral composition of artificial light when assessing its impact on ecosystems.

E. Other Interests of MMA

The Maria Mitchell Association (MMA) depends on tourism and the overall economic environment in Nantucket in several ways:

1. Visitors to Nantucket: The island of Nantucket is a popular tourist destination, and many visitors come to explore its history and natural beauty. The MMA is one of the key attractions on the island, and it welcomes thousands of visitors each year who come to see the Maria Mitchell Observatory and House, participate in educational programs, and attend events and lectures. The revenue generated from admission fees, gift shop sales, and other sources helps to support the MMA's mission and operations.

2. Local partnerships and collaborations: The MMA collaborates with other organizations on the island to promote education, scientific research, and conservation efforts. These partnerships are often facilitated by the economic environment in Nantucket, which supports a variety of businesses and organizations that are committed to sustainable development and preserving the island's natural and cultural resources. MMA also maintains an over one-century legacy of inspiring and training the next

generation of astronomers, many of whom have been women. The impact of MMA's astronomical research and intern program has an outsized influence on the astronomical world, not just from the research contributions themselves, but from the legacy of over 400 astronomy interns who have passed through the doors of MMA and its observatories and under Nantucket's dark skies.

3. Fundraising and donations: Like many non-profit organizations, the MMA relies on donations and fundraising activities to support its operations. The economic environment in Nantucket can have an impact on the MMA's ability to secure funding, as donors and supporters may be more or less willing to give depending on the overall health of the local economy.

Overall, the Maria Mitchell Association plays an important role in the tourism industry in Nantucket, and it is closely tied to the island's economic environment. By promoting education, scientific research, and conservation efforts, the MMA contributes to the overall health and sustainability of the local economy and community.

In addition to disrupting the night sky, other potential effects that impact the MMA and its mission to provide connection to the natural world, the relevance of its aquarium (which reflects the life in the waters off the island) and its preservation and documentation of local species are:

1. Disruption of wildlife habitats: The construction and operation of wind turbines can disrupt the habitats of marine species, including fish, whales, and seabirds. The noise, vibrations, and electromagnetic fields generated by the turbines can interfere with the behavior and migration patterns of these animals.
2. Impacts on migratory birds and butterflies: Nantucket is an important stopover site for migratory birds, and wind turbines could pose a risk to these species. Birds can collide with the blades of the turbines, and the presence of the turbines could also deter birds and butterflies from using the area for migration or breeding.
3. Changes to ocean currents and sedimentation: The installation of wind turbines can alter ocean currents and sedimentation patterns, which could have an impact on the marine ecosystem and the distribution of species.
4. Visual impacts: Wind turbines can have a significant visual impact on the landscape, which could have negative effects on the tourism industry and the overall character of Nantucket Island.

II. Absence of Consideration of Certain Likely Adverse Effects

To our knowledge, there has been no consideration or analysis of several critical adverse effects and no discussion of potential mitigation of those effects. These include the historic use of MMA's observatory and other properties, the observation by MMA members and others of the stars and of dark skies generally from all locations within the relevant geographical area, and the economic impact of the proposals on MMA and other similarly situated parties. To be sure, there has been limited consideration given to nighttime visual impact – an issue we discuss below – but the issues identified above are distinct from this topic and have not been addressed in any way to our knowledge.

A. Historic and Current Use of MMA Property and of Nantucket Historical District Generally for Night Sky Observation and Enjoyment

For over 100 years, MMA and its stakeholders have utilized MMA's observational facilities and other properties to observe, research, and understand the night sky and humanity's place in the cosmos. This occurs for scientific purposes funded by NSF and for other purposes including enjoyment, educational, and human enrichment. In addition, as a result of MMA's historical educational activities and presence, as well as independently, numerous others who reside within the Nantucket Historical District or who visit it, observe the night skies from locations throughout the district as an essential and enriching part of the experience of the district. The existence of dark skies and the ability to observe dark skies are each an essential and longstanding part of the experience of MMA as part of the Nantucket Historical District and of Nantucket more generally as an historical district.

There are many cities and towns in the United States where light pollution has diminished observatory functions. Light pollution is the result of excessive or misdirected artificial lighting that can interfere with astronomical observations by creating a bright background glow in the night sky. This can make it difficult to observe faint objects and can reduce the overall quality of astronomical data.

Some examples of cities and towns where light pollution has had a significant impact on observatory functions include:

1. *Los Angeles, California: Los Angeles is known for its bright lights, and the city has struggled with light pollution for many years. The light pollution from the city has had a significant impact on observatories located in the nearby mountains, such as the Mount Wilson Observatory and the Palomar Observatory.*
2. *Tucson, Arizona: Tucson is home to several major observatories, including the Kitt Peak National Observatory and the Large Binocular Telescope Observatory. Despite efforts to reduce light pollution in the area, the observatories still face challenges from the city's urban growth and development.*
3. *New York City, New York: New York City is one of the most densely populated cities in the United States, and its bright lights have a significant impact on astronomical observations. The Hayden Planetarium at the American Museum of Natural History in New York City has even developed a "virtual sky" to simulate what the night sky would look like in a darker location.*
4. *Flagstaff, Arizona: Flagstaff has taken a proactive approach to reducing light pollution, and the city has been designated an "International Dark Sky City" by the International Dark-Sky Association. The city is home to several observatories and research facilities, including the Lowell Observatory.*

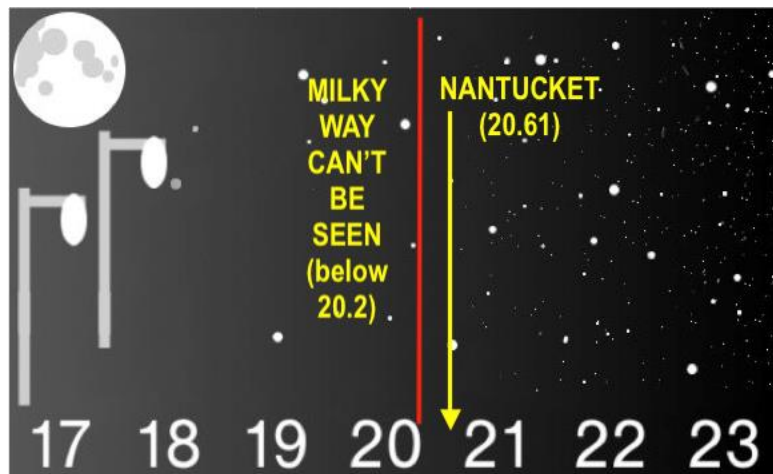
These are just a few examples of cities and towns in the United States where light pollution has had a significant impact on observatory functions. The impact of light pollution on astronomy is a growing concern, and efforts are underway to reduce light pollution and preserve the ability of astronomers to make important observations.

B. Some Examples of Issues for Consideration Relating to Observation of Dark Skies

The construction, establishment, operation, repair, and ultimate decommissioning of arrays of turbines in an otherwise unlit section of ocean raises questions that must be answered by BOEM and the wind turbine leaseholders regarding the introduction of new light sources. Since the turbines are under the regulatory authority of BOEM, we request that BOEM confirm whether the turbines themselves will be illuminated in the same manner as towers under the regulations of the FAA (or, if BOEM does not intend to adopt the FAA regulations, we ask that BOEM provide for public review and comment the specifications that do apply for illumination of the

turbines). Required lighting for such towers includes FAA L-864 lights on the nacelle, and L-810 lights on the mast (FAA AC 70/7460). We also request information concerning the lighting associated with construction, ongoing staffing, operation and repair, and ultimate decommissioning of the project.

1. Color spectrum. Has BOEM considered and what assurances can BOEM provide that any instruments so installed (a) are true red; (b) if white, have an acceptably low level of blue component to the spectrum; (c) do not exceed rated lumen and candela output as specified in FAA AC 150/5345 (2,000 cd at nighttime)? Note that the FAA allows a variance of up to 25% of intensity; will BOEM require greater or lesser adherence to the specification?
2. Directionality. FAA requirements currently allow 3 to 7 degrees of vertical beam spread. As noted above, the more vertical spread, the more potential for stray upward illumination, and thus more skyglow and less dark sky. Has BOEM considered and will BOEM allow this full range of spread or will it require a tighter beam?
3. Measurement. Has BOEM considered who is responsible for measuring the performance of the lighting instruments prior to the turbine being brought online? If it is self-attestation by the owner of the turbine, what checks or audits are in place to assure compliance? If it is performed by BOEM, will this be by BOEM personnel or by a third party? In either case, what tools are deemed acceptable for the measurement, and by what authority? What is the verification cycle, to ensure that the lighting stays within regulatory boundaries over time?
4. Threshold. The International Dark-Sky Association (IDA) uses magnitudes per square arcsecond (mpas) to evaluate the darkness of the sky. A reading of lower than 20.2 mpas means that the Milky Way is no longer visible. On Nantucket, the average reading is currently 20.61 as shown:



Will BOEM be monitoring the level of skyglow as part of their permitting process or otherwise? Will BOEM commit to requiring that the current dark skies over Nantucket be maintained or improved?

C. Standard Ways to Measure Baseline and Possible Impact

The IDA uses a variety of calibrated monitoring equipment around the world to track the quality of the night sky.

The International Dark-Sky Association (IDA) uses a variety of calibrated monitoring equipment around the world to track the quality of the night sky. These devices are designed to measure the brightness of the night sky and assess the impact of light pollution on astronomical observations, as well as on wildlife, human health, and the environment.

Some of the equipment used by the IDA includes:

1. *Sky quality meters (SOMs): These devices measure the brightness of the sky in magnitudes per square arcsecond and can be used to generate standardized data that can be compared across different locations and times.*
2. *Radiometers: These devices measure the intensity of light in different wavelengths and can be used to determine the spectrum of light pollution in a given location.*
3. *Photometers: These devices measure the amount of light in a specific range of wavelengths and can be used to measure the brightness of specific sources of light, such as streetlights or advertising signs.*
4. *All-sky cameras: These devices capture images of the entire sky and can be used to generate time-lapse videos or still images that show the brightness and movement of stars, planets, and other celestial objects.*
5. *Portable observatories: These are mobile observatories that can be deployed to remote or rural areas to conduct scientific research on the night sky and collect data on the impact of light pollution.*

By using a variety of calibrated monitoring equipment, the IDA is able to collect standardized data on the quality of the night sky in different locations around the world. This data can be used to raise awareness of the importance of dark skies, promote policies and regulations that limit light pollution, and encourage the development of sustainable lighting practices that preserve the natural beauty of the night sky.

Has BOEM identified a baseline and an anticipated impact on that baseline? Will BOEM monitor the light sources from permitted wind farms against the current baseline?

D. Economic Impact

The Maria Mitchell Association is heavily dependent on the dark skies and the local economy to support its operation. As an astronomy and science education organization located on Nantucket Island, the Maria Mitchell Association relies on the island's dark skies to offer nighttime programs and activities for visitors and residents. The organization operates a public observatory, a natural science museum, and an aquarium, all of which attract visitors to the island and contribute to the local economy. However, the organization's ability to offer nighttime programs and attract visitors is heavily dependent on the preservation of the island's dark skies. As light pollution and development continue to encroach on the island, the Maria Mitchell Association and other organizations dedicated to preserving the dark skies of Nantucket are working to raise awareness and promote sustainable development practices to ensure the continued success of the island's economy and scientific organizations.

E. Current Status

To MMA's knowledge, none of the foregoing impacts have been considered to date. No consideration has been given to the impact of the proposed project on: MMA's historical and current use of its observatory for observation of stars and other elements of the night sky dome; MMA's historical and current educational mission with respect thereto; the historical and current use of numerous other locations throughout the Nantucket Historic District for observation of stars and other elements of the night sky dome; the economic impact on MMA; or the impact on MMA's other missions regarding appreciation of the sea scape, sea life, and nature more broadly. The approach has instead been to focus exclusively on the degree to which aviation lighting on the towers is perceptible by observers in one location on shore. While important, this is a distinctly different issue from the issues identified above.

III. Concerns Regarding the Limited Consideration That Has Occurred to Date

The DEIS appears to rely exclusively on the report provided by AECOM, the consultant hired by the applicant, which itself appears to have adopted an approach based exclusively on comparing: (a) photographs taken by AECOM in 2020 using a Nikon D4 camera (COP 4.2.1) with (b) “simulations” generated by AECOM through digital manipulation of the photographs. The chosen approach fails to provide an adequate basis for understanding the proposed project and its impacts on dark skies for numerous reasons including but not limited to:

A. **Lack of Quantitative Data & Analysis** – visual impact as measured by photographs is only one part of the exercise. Using standard scientific methods, precise lumen levels and other quantitative measurements can and must be made as part of both the baseline and “alternative” assessment.

B. Non-Standard Equipment –

While the Nikon D4 camera can be used to capture images of the night sky, it is not the appropriate equipment to use for standard dark skies measurement. This is because the camera's built-in light meter is designed to measure the amount of light that is being reflected off the subject being photographed, rather than the amount of ambient light in the surrounding environment. Additionally, the camera's sensor can be affected by factors such as temperature, humidity, and atmospheric conditions, which can introduce errors and inconsistencies into the measurements. Any equipment used must be calibrated and standardized for accurate measurement and error analysis.

Light measurement meters, on the other hand, are specifically designed to measure the amount of ambient light in a given environment and are calibrated to provide accurate and reliable measurements. These meters can be used to measure a variety of different types of light, including visible light, infrared light, and ultraviolet light, and can provide readings in a variety of different units, such as lux, foot-candles, or micromoles per square meter per second.

To accurately measure dark skies and assess the impact of light pollution, it is important to use equipment that is specifically designed for this purpose, such as specialized light meters or sky quality meters. These devices are designed to provide accurate and reliable measurements of the brightness of the night sky and can be used to generate standardized data that can be used for scientific research and policy-making. Using equipment that is not designed for this purpose can result in inaccurate or inconsistent measurements, which can compromise the integrity of the data and limit the effectiveness of efforts to address light pollution.

C. **Poorly Chosen Equipment Settings** – There is inadequate explanation provided for the shutter speed, aperture, and other settings used in the camera.

D. **Inadequate Elevation and Location** – The only KOP for which nighttime information regarding Nantucket was provided originally was 12N – Cisco Beach. The newly published revised COP uses a different KOP from Tom Nevers as well. It appears that the KOP was measured based upon the eye-height of an adult standing on the beach. COP 4.1.2; 4.2.5. But, for purposes of observing night skies, multiple other KOP's must be considered including observational heights associated with MMA's observatory, rooftop observation of the skies from homes, and other sites from which dark skies are appreciated and also including beach locations in the western part of the island closer to the development location.

E. **Limited Orientation** – the orientation for the photographs focuses on the horizon. To be sure, the horizon orientation is an important one. But data should also be collected focusing more clearly upon the impact of the project's lighting on the entire night sky.

- F. **Incomplete Assumptions About Observer Activities** – the approach assumes that observers will use only their naked eyes to appreciate the night sky and does not take into account or provide any data or information with respect to the changes from baseline that will occur for those using telescopes or other observational equipment.
- G. **Small Sample Size**-- Images are provided for only one KOP on one day at one time under one set of environmental conditions and using one camera setting.
- H. **Unexplained Inconsistent Data** -- The provided images do not align with the images made public by the applicant in COP Appendix T, Attachment 2
- I. **Withheld Data** -- The COP references the existence of additional “confidential” images, which are not included in the DEIS or provided in the publicly accessible version of the COP.
- J. **Data Promised but Not Provided** -- The COP asserts that video simulations and imagery will be provided in support of the proposal, but we have not been able to locate the video simulations in the DEIS or the public record.
- K. **Data Provided Only from the Applicant not from other Sources** – It appears that BOEM did not retain or consult with any independent experts in this area but rather that the DEIS relies exclusively on data provided by the applicant based upon reports funded by the applicant.
- L. **Unexplained Methodology Regarding Digital Alteration** – Neither the COP nor the DEIS explain the specifics of the methodology used to digitally alter the nighttime photographs in order to create the “simulations” that are provided.
- M. **Impacts of Permanent Lights on Structures** – The DEIS and COP each appear to assume that once an object is located below the curvature of the earth it will no longer have impacts on the KOP. Based on this assumption, there appears to have been little to no consideration given to lighting from “lower levels” of the permanent structures. While the assumption regarding curvature of the earth may be true when it comes to perceiving a physical object itself, the assumption is not necessarily true when it comes to perceiving light given off by a physical object. The light may be visible from the KOP even if the lighting source is not. In addition, the light may have impacts on the night sky from the vantage point of the KOP that are beyond the impact of just seeing the light itself.
- N. **Impacts of Lights from Sea and Air Traffic** – It is unclear whether any consideration was given to the quantitative and measurable anticipated impact on dark skies from the lighting associated with the increased sea and air traffic created by the ongoing operation of the proposed project itself, from the need to maintain and repair the project on an ongoing basis, and from the changed sea routes of other traffic that will be caused by the physical barriers that the project and related projects create. These effects are likely material and should be considered.
- O. **Impacts of “Temporary” Lights** – Both the construction and the decommissioning of the projected are described at times as “temporary.” Even under generous assumptions about the time to complete these activities for just this one project, the temporary effect is for a substantial period of time. Once the cumulative effect of construction

and decommissioning of other proposed projects is taken into account, the “temporary” begins to become “continuous.” The effects on dark skies of the lighting generated by sea traffic, structures, and activities associated with construction and decommissioning do not appear to have been quantified and taken into account in the DEIS.

- P. **Inadequate Assumptions About the Quantity of WTG Lighting** – FAA regulations, adopted as guidance by BOEM, require at least two intense red lights for each and every structure to be placed at the top of the nacelle and three or more such lights slightly lower down the structure. FAA, *infra*, 13.7.1. The COP and DEIS concede that the effect of mandatory WTG lighting would be “major” when it comes to dark skies. However, they rely also upon the assumption that ADLS will be able to be used and that such use will cause the “major” effect to exist for fewer than five minutes per year. This conclusion is based upon a three-page analysis conducted by Capital Airspace Group and submitted and funded by the applicant. COP Appendix Y3. The brief analysis however is inadequate, among other reasons, because it is based exclusively on a calculation of how often identified aircraft with active transponders entered the relevant airspace during the period February 1, 2019, through January 31, 2020. This analysis fails to take into account, among other things, that:

There will be substantially increased air traffic associated with construction and operation of the project itself. See, e.g., DEIS at 3.4-22 referencing 280 airplane trips per year and 2080 helicopter trips per year (quoting COP Vol 1, Section 3.3.14.1 Table 3-21)

There will be substantially increased air traffic associated with the other projects currently anticipated for development as well.

The relevant airspace does not require active transponders in all cases and therefore an assessment of how many aircraft without active transponders will be present is required.

It is not clear that the data consulted by Capital Airspace included data relating to military aircraft.

Air traffic to and near the island is at a higher level than it was during the measurement period.

ADLS may be set off by things other than aircraft, including WTG’s or other objects in the area, wildlife, ships, or weather developments, to name a few. See e.g., <https://detect-inc.com/aircraft-detection-lighting-systems/> (describing sensitivity to birds and drones)

Companies participating in the ADLS market promote and contemplate that ADLS be set to detect objects at a boundary greater than the minimum distance required by the FAA/BOEM. <https://detect-inc.com/aircraft-detection-lighting-systems/>

FAA regulations, as adopted in BOEM guidance (see *infra*), require lighting activation not only during night-time hours but also during any period of reduced visibility. FAA at 13.51.

ADLS may malfunction and create lighting beyond that it is intended to due to oversensitivity or error.

FAA regulations, adopted by BOEM as guidance, require that all lighting be activated and remain activated in the event of any malfunction or error in even one part of the overall system. 4/28/21 Guidelines for Lighting

and Marking of Structures Supporting Renewable Energy Development, BOEM; FAA, 11/16/20 AC70/7460 at 10.25.

These are just examples. The myriad of possibilities that the real world throws up are exactly why looking only at 2019 flight data is inadequate when real-world experience with ADLS exists and should be taken into account. See, e.g., <https://ocean-energyresources.com/2022/08/04/deutsche-windtechnik-is-granted-worlds-first-approval-for-use-of-adls/>

- Q. **Inadequate Assumptions About the Effect of WTG Lights:** The COP and DEIS concede that the effect of mandatory WTG lighting would be “major” when the lighting is “on” but assume that there is no effect at any other time. However, the effect of a flashing light on observers and their ability to appreciate the night sky likely persists beyond the time that the light is actually “on.” This is particularly true if the observer is using observational equipment. This additional potential effect was not considered and should be.

IV. Concerns Regarding the Process Itself

MMA also has concerns about the process itself. For example, BOEM has published a draft Memorandum of Agreement (MOA) at a time when there is still no consensus on what adverse effects will flow from the projects, much less how those effects might be mitigated. The draft MOA contains no mitigation pertinent to MMA in any way and MMA was not consulted with respect to the draft MOA. The limited mitigation that is identified in the draft MOA appears to be window dressing at best. Both the premature timing of publishing such a document and the patently inadequate content of the document raise concerns about whether there is a predetermined result of the process. MMA objects.¹

* * *

¹ Other examples include the failure of BOEM to rely upon any sources other than the applicant’s own hired consultants, the rapid pace at which the process is proceeding, the failure of BOEM to reveal the existence of a revised COP until the day comments were due, the failure to publish much of the relevant information at all and, when published, the failure to do so in a readily accessible and readable format.

MMA genuinely wishes to cooperate closely with the other parties to achieve the best possible outcome. At present, however, MMA's interests and issues are either entirely ignored or, in some cases, given only the most cursory and inadequate attention. MMA respectfully requests that BOEM address these issues and MMA stands ready to provide information and devote resources to helping BOEM do so effectively. Thank you for your consideration of this important matter.

Respectfully submitted,

Joanna Roche
Executive Director

cc: Sarah Stokely, Bureau of Ocean Energy Management
Christopher Koepfel, Advisory Council on Historic Preservation
Christopher Daniel, Advisory Council on Historic Preservation
Ruth Ann Brien, U.S. Army Corps of Engineers
Elizabeth Mahoney, Massachusetts Department of Energy Resources
Brona Simon, Massachusetts Historical Commission