U.S. Environmental Protection Agency
Region 2

RESPONSE TO PUBLIC COMMENTS

OUTER CONTINENTAL SHELF AIR PERMIT

EPA Permit Number: OCS-EPA-R2 NJ 02

For the

Atlantic Shores Offshore Wind Project 1, LLC
Atlantic Shores Project 1 and Project 2

September 29, 2024

Introduction

On July 11, 2024, the U.S. Environmental Protection Agency, Region 2 Office ("EPA") issued for public review a draft Clean Air Act Outer Continental Shelf ("OCS") air permit to Atlantic Shores Offshore Wind Project 1, LLC ("Atlantic Shores" or "the applicant" or "the Permittee") to develop OCS lease area OCS-A 0499 into two wind farms, known as Atlantic Shores Project 1 ("ASP1") (1,510 MW) and Atlantic Shores Project 2 ("ASP2") (target capacity of 1,327 MW), collectively referred to as the OCS Facility, the Atlantic Shores Project, or the project.

The draft permit was available for public comment from July 12, 2024, through August 16, 2024. In addition to accepting written comments during that time, the EPA held a virtual public hearing on August 12, 2024. A total of approximately 611 commenters submitted written comments to the EPA. In addition, 16 commenters provided oral comments during the virtual public hearing. A copy of the hearing transcript is available at docket number EPA-R02-OAR-2024-0312 at regulations.gov. The majority (over 92%) of the total comments received were supportive of the proposed project. Opposing commenters provided a variety of reasons for opposing the project, which are presented in this document along with EPA responses to those comments.

After a careful review of all the public comments received, the EPA is issuing the final OCS air

permit ("final permit") for the Atlantic Shores Project. As required by 40 C.F.R. Part 124 ("Procedures for Decision Making"), the EPA has prepared this document, known as the "Response to Comments" ("RTC"), that addresses all comments received during the public comment period.

Because of the variety of comments received, EPA has organized the comments and its responses into 11 separate subject-based sections. For simplicity, EPA consolidated comments that were identical or similar as if the comments were made by a single commenter. Only relevant comments were included in this summary (although not all are within the scope of this permitting action). Some comments have been edited for clarity and brevity. The 11 sections in this RTC document are:

Finally, at the end of this RTC beginning on Page 109, we included a "Summary of All Changes from Draft OCS Permit to Final OCS Permit as a Result of Comments Received During the Public Comment Period."

Section 1.0 - Sulfur Hexafluoride (SF_6) Emissions

Comment 1.1
This project will utilize more than 47,000 lb of SF_6 in offshore substations. Despite measures to keep this GHG from escaping, "leak rates" are fully expected during normal operations and maintenance of 0.5 to 1% per year. That, of course, is assuming that there are no accidental releases such as what happened at the Seagreen offshore wind area in the North Sea. Twenty-four pounds of SF_6 leaked during routine work in 2022 in which 80 workers had to be evacuated.

Response 1.1
The maximum amount of SF_6 that will be utilized by the project has not been finalized because the facility has not yet completed its final design plans. However, the permit limits annual emissions from leaks of SF_6 (converted to the unit of carbon dioxide equivalents, or CO_2e) during the operations and maintenance (O&M) phase of the project to no more than 3,519 tons of CO_2e per year (and limits CO_2e emissions from all OCS sources regulated under the permit combined to a total of 30,387 tons of CO_2e per year). This means that SF_6 emissions may account for up to about 11.6% of the total CO_2e emissions from the project's OCS sources. In addition, to minimize potential SF_6 emissions, the OCS permit requires the use of SF_6-free switches on level 1 of the offshore substations, where the applicant has identified that use of such switches is feasible (given considerations such as market availability of the SF_6-free switches for the needed power, size, and weight of the equipment). Moreover, for switchgears where no viable SF_6-free switches are currently available, the OCS permit contains requirements to install SF_6 leak detection and monitoring systems and specifies procedures to repair any potential leakages in a timely manner. Also *see* Response 1.3 for additional future requirements to minimize SF_6-containing switchgears.

Comment 1.2
Have the residents of Atlantic City been informed of the use of these toxic greenhouse emitting chemicals in this project? According to BOEM documents, the following chemicals will be used by the Atlantic Shores Project…. Have the residents living in close proximity been informed of the use of SF_6, one of the most potent and persistent greenhouse gas known to man? The U.S Environmental Protection Agency reported, 'SF_6 is the most potent greenhouse gas known. It is 23,500 times more effective at trapping infrared radiation than an equivalent amount of CO_2 and stays in the atmosphere for 3,200 years.' The agency also notes that a relatively small amount can 'have a significant impact on global climate change' and that leaks can occur during 'installation, maintenance and servicing.' Employees must evacuate the work area during leak events. The question is how many such leaks go unreported."

Response 1.2
SF_6 is a greenhouse gas that is used as insulation in the electricity industry to keep networks running safely and reliably. Around 80% of the SF_6 used globally is in electricity transmission and distribution. Medium- and high-voltage equipment contains SF_6 to insulate the live electrical parts and to switch the flow of electrical current on and off. The same equipment is also used to connect generation and storage components of renewable energy systems. The applicant's estimates indicate that SF_6 emissions from leaks may account for about 11.6% of

the total CO_2e emissions from the project's OCS sources during the O&M phase. This OCS permit addresses the use of SF_6 in the Atlantic Shores Project's offshore equipment (not onshore switchgear equipment); Table 3 in the OCS permit outlines where the SF_6 will be used.

The discussion in Response 1.1 addresses the requirements in the OCS permit to minimize SF_6 emissions from leaks from the Atlantic Shores Project. SF_6-free switchgears are currently not technically and economically available in the marketplace for all high voltage applications. Also *see* Response 1.3 for additional future requirements to minimize SF_6-containing switchgears. *See* Response 3.2 for communications with the Atlantic City community.

Comment 1.3
We strongly urge EPA to explore all possible alternatives to avoid the potential leakage of SF_6. As an obvious example, we are pleased to see that Atlantic Shores will be using SF_6 alternatives (G3-insulated bus ducts) on the OSSs for bus ducts on level 1 related to the inter-array cables. Similarly, Atlantic Shores itself notes that "it may be possible to replace up to 106 SF_6 switchgears with non-SF_6 versions for the Project 1 wind turbine generators (WTGs) based on the state of available technology." 2.1.3 AS Oct 28 2022 Submittal in Response to EPA Comments Sept 30 2022, Doc. ID No. EPA-R02-OAR-2024-0312-0032, at 9.

Moreover, even if EPA agrees with Atlantic Shores that non-SF_6 technology is not BACT for Project 1, EPA should defer such a determination for Project 2. As Atlantic Shores acknowledges, the rapid pace of technological development in wind technology indicates that cleaner options are likely imminently available. See id. ("the recent pace of WTG technology development makes it possible that the WTG model that will be used for Project 2 is not available on the market today"). Again, given the global warming potential of SF_6, we urge EPA to be careful in making a BACT determination.

Similarly, we urge EPA to not regard this as the end of the discussion on SF_6—given 5-year re-permitting cycle for Title V permits and further permitting requirements on the part of New Jersey Department of Environmental Protection (NJDEP), we recommend reassessing SF_6 emissions every 5 years to consider all new technology options that could become technically feasible for the project's specific space and weight requirements if the gas insulated switchgears in question can be mechanically replaced and as they are replaced due to wear and tear.

Response 1.3
The OCS permit does not lock the project into installing switchgears containing SF_6. As the project design progresses and more SF_6-free switchgears become available for a specific application, the permit does not prevent the facility from using more SF_6-free switchgears in lieu of switchgears containing SF_6 in the final project design. In addition, in light of this comment, EPA is revising Permit Condition IV.D.2.e. to require the applicant to consider the technical and economic viability of installing SF_6-free switchgears whenever an SF_6-containing switchgear needs to be replaced with a new one. *See* Response 7.11(e) for the revised condition.

Comment 1.4
Any proposed SF_6 mitigation measure must be comprehensive and prioritize safety over financial compensation. The potential for catastrophic accidents from leakage of SF_6 alone, necessitates a

more substantial and comprehensive mitigation strategy that addresses the full scope of mitigation measures and risks these turbines introduce.

Response 1.4
The OCS permit contains requirements to install SF_6 leak detection and monitoring systems and specify procedures to repair any potential leakages in a timely manner. Such systems and procedures are the current standard industrial practices for SF_6-containing switchgears in many existing offshore wind farm projects. The commenter did not identify what a "more substantial and comprehensive mitigation strategy…" would be. Therefore, the commenter has not provided EPA with a basis to change the above-mentioned requirements, and EPA is leaving them unchanged. *See also* Response 1.1.

In addition to the requirements in the OCS air permit, the Atlantic Shores Project will have to comply with requirements imposed, *inter alia*, by BOEM's ROD (*see* Response 4.1 for a link to the ROD), which implements many mitigation measures to prevent accidents from occurring or causing environmental or human health degradation. Specific to SF_6 concerns, page 89 of the ROD states, in part:

> *The Lessee must follow International Electrotechnical Commission and requirements in EPA's OCS air permits for SF_6 leak detection and monitoring requirements. The Lessee must also follow manufacturer recommendations for service and repair of the affected breakers and switches and conduct visual inspections of the switchgears and monitoring equipment according to manufacturer recommendations.*

Comment 1.5
The draft permit directs Atlantic Shores to use G3 equipment when possible and requires mitigation measures such as alarms to detect leaks as soon as they occur; following manufacturer-prescribed maintenance, monitoring, and emissions minimization measures; completely replacing switchgears containing SF_6 in the event that damage occurs; and only using equipment that guarantees an annual emissions rate of less than 0.5% of the weight of the SF_6 stored in the turbines. Offshore monitoring and enforcement on large scale wind powerplants is untested in US waters. Given the climate impacts of SF_6, EPA must require the applicant to prove the ability for reporting and compliance with the above-described limitations. In the meantime, the government should be investing more in the development of alternatives to SF_6 so that this chemical can be banned.

Also, as a matter of protective policy, and considering the extraordinary global warming potential of SF_6, the air quality impacts of other offshore wind projects planned for the New York Bight should also be considered and added to the impacts contemplated in Atlantic Shores' draft air permit. This must also include the pre-construction surveying activities conducted during the planning and design phases of Projects 1 and 2.

Response 1.5
As discussed in Response 1.4, the SF_6 offshore monitoring and enforcement protocols in the permit follow current standard industrial practices being used at wind farms offshore Europe

and the United States. EPA has no data at hand or reason to believe that the SF_6 offshore monitoring and enforcement protocols in the permit will not work in US waters as they have at European wind farms. The commenter has likewise not provided or identified any such data or the need for such data. Vineyard Wind 1 and, more recently, South Fork Wind are already delivering electricity from their respective wind farms to US utilities using similar protocols without reported problems related to the existing protocols. Whether the US government should invest more in the development of alternatives to SF_6, as the commenter suggests, is outside the scope of this permit proceeding.

The climate impacts of greenhouse gases are a global problem, not a localized issue. Therefore, with regards to climate change-related impacts from SF_6, the commenter's suggestion to combine and review the GHG impacts from SF_6 from this project and other offshore wind projects planned for the New York Bight would not provide any particularly useful data. Finally, BOEM's Record of Decision (ROD) states that the project purpose and need for the project, as provided by the applicant and reviewed by the US Army Corp of Engineers, "will help both the United States and New Jersey achieve their renewable energy goals, diversify the State's electricity supply, increase electricity reliability, and reduce greenhouse gas emissions." *See* BOEM's ROD at page 50 of 208.

Pre-construction surveying activities conducted during the planning and design phases of Projects 1 and 2, and the impacts of those activities, are outside the scope of this OCS permit.

Section 2.0 – Utilization of the Most Efficient Marine Vessels

Comment 2.1
The permit application does not require the Atlantic Shores Project to utilize the most efficient marine vessels for the construction and maintenance of these projects. In the permit application, it specifically states that "the air emission estimates presented in this application are subject to change." By how much? No permit should be granted until they are required to operate the most efficient vessels available to reduce the air quality impact to our State.

Response 2.1
The applicant has not yet contracted the marine vessels it will use, and thus in its application, it relied on representative vessels and marine engines to estimate its emissions and impacts and to conduct Clean Air Act emissions analyses. Its ability to contract for specific vessels will depend on the pool of marine vessels that are available on the timeline needed for deployment. However, the draft OCS permit and final permit both contain permit conditions, such as daily emission limits and annual potential to emit limits, that limit the OCS Facility's emissions to the levels the applicant indicated in estimates and analyses and which the applicant used to demonstrate compliance with Clean Air Act requirements.

In addition, the permit contains permit conditions regarding choosing the cleanest (most efficient) OCS source vessels available. The application proposed that, since the applicant has not yet contracted any OCS source vessels for the project, it would use the marine vessels with the highest-tiered (i.e., cleanest, and thus the most efficient) engines available at the time of

deployment. The draft OCS permit already contains a permit condition that requires the facility, for each OCS source vessel, to contract the OCS source vessel with the highest-tiered engines that would be available at the time of contract to work in the necessary timeframe and for the specific work required. The draft permit also has corresponding recordkeeping and reporting requirements to show compliance with this requirement. These requirements have all been retained in the final permit. Taking such steps to use OCS source vessels with the highest-tiered engines available at the time of contract, combined with the permit's additional requirement that the engine in these vessels meet requirements including Best Available Control Technology (BACT), Lowest Achievable Emission Rate (LAER), New Source Performance Standards (NSPS) in Part 60, Subpart IIII (NSPS IIII), and State of the Art (SOTA) emission standards, ensures that emissions are minimized as much as possible, given the limited information available at this time in the absence of existing vessel contracts.

Comment 2.2
The transportation and installation processes will likely involve substantial emissions from vessels and machinery, contributing to air pollution and greenhouse gas emissions.

Response 2.2
Emissions from transportation and installation will come from engines onboard vessels, powering machinery or the vessel itself (propulsion). The OCS permit establishes maximum daily and annual emission limits for pollutants from all the engines during the Construction & Commissioning (C&C) and Operations and Maintenance (O&M) phases of the project. The OCS permit contains permit conditions regarding choosing OCS source vessels with the highest-tier (cleanest, most efficient) marine engines available for the necessary timeframe and for the specific work required, to minimize air emissions (*see* Response 2.1). And, the OCS permit requires the Permittee to comply with BACT, LAER, NSPS IIII, and SOTA emission standards for marine engines onboard OCS source vessels.

Further, under the Clean Air Act's Prevention of Significant Deterioration of Air Quality (PSD) requirements at 40 C.F.R. § 52.21, the applicant is required to demonstrate that air quality impacts from emissions during the C&C phase, as well as during the O&M phase, are within (i.e., do not exceed) the National Ambient Air Quality Standards (NAAQS) and PSD Increments. Meeting NAAQS and PSD Increment requirements is intended to ensure that projects would not significantly cause or contribute to air quality worsening (i.e., would prevent significant deterioration) beyond certain levels set by the regulations. The air modeling analyses prepared by the applicant show that the project meets these PSD NAAQS and Increment requirements.

Comment 2.3
Commenter would like to stress the importance of contracting and utilizing vessels with the highest-tier engines as possible within each vessel category in order to achieve the highest possible fuel burning efficiency, and prioritizing the usage of ULSD [ultra-low sulfur distillate] fuel instead of residual fuel to reduce the emissions of air toxics or co-pollutants. We recommend significant and robust planning ahead of time in order to secure the high-tiered engine vessels for the C&C phase. Additionally, we also recommend this approach for the O&M phase.

Response 2.3

See Response 2.1 for an explanation on how contracting with vessels with the highest-tier engines available at that time and capable of doing the work necessary at the necessary time is addressed in the OCS air permit. This approach applies to contracting OCS vessels for use during both the C&C and O&M phases.

With respect to ULSD, the permit requires that all marine engines that are capable of burning ULSD with 15 ppm sulfur or less do so. However, there will be a small number of vessels with marine engines where the use of ULSD is not possible. In those few cases, they will burn Emission Control Areas (ECA) marine fuel with a sulfur content less than 1,000 ppm. For additional information on ECA marine fuel, *see* https://www.epa.gov/sites/default/files/2015-10/documents/420b14097.pdf.

Comment 2.4

According to EPA in the Fact Sheet at page 38, Atlantic Shores takes no responsibility for the air polluting emissions from marine vessels that it is procuring. "Atlantic Shores explained that it would be extremely costly to replace, retrofit, or upgrade leased vessels in order to use add-on pollution controls or implement inherently lower-emitting practices or design." That is an egregious dereliction of duty by both Vendor/Atlantic Shores and Regulator/EPA. Atlantic Shores must be held responsible for its machinery, or EPA should find another Vendor.

Response 2.4

EPA does not make individual vessel for hire selections for applicants. However, for OCS source vessels, the OCS air permit requires Atlantic Shores to hire the OCS source vessel with the highest-tier (i.e., cleanest, most efficient) engines available for the specific work needed in the timeframe needed. Atlantic Shores is not responsible for retrofitting/upgrading existing engines with add-on pollution controls for the vessels it decides to hire due to the high costs involved and the extended time it would take to retrofit them. Also *see* Response 2.1.

Comment 2.5

Commenter is concerned that with the unknown contracts for the actual vessels that will be used, the types of vessels and thus emissions are only estimates at this time. Therefore, there is a reasonable potential for more air pollution than publicly noticed.

Response 2.5

See Response 2.1. As discussed above, regardless of which actual vessels the Permittee hires, the OCS air permit requires that the OCS Facility as a whole meet daily and annual emission rates specified in the permit that are based on the applicant's representations in the air quality analysis that was provided. In addition, as discussed in Response 2.1 and elsewhere, the applicant is required to contract OCS source vessels with the highest-tier engines available at the time of contracting that can do the work required in the timeframe needed. And, regardless of the vessel contracted, the engines on all OCS source vessels and on the offshore substations (OSSs) have to meet the applicable LAER, BACT, NSPS IIII, and SOTA emission rates specified in the permit.

Comment 2.6
The permit gives Atlantic Shores the option of several representative vessel types typically used for similar offshore wind projects, or any other vessel or engine that meets the requirements in the permit, including but not limited to National Source Performance Standards (NSPS) Subpart IIII requirements, best available control technology (BACT) and lowest achievable emissions rate (LAER) requirements, and state of the art (SOTA) requirements. Similarly, the permit lists two potential types of non-marine engines that Atlantic Shores could use for the offshore substations, because the exact specifications for the engines are unknown.

Another justification for this approach is that Atlantic Shores will contract all the vessels it is using for the projects, so it will not have the right to retrofit or upgrade the vessels to incorporate the best possible emissions control technology. According to the permit application, waiting for vessel owners to make the upgrades themselves would result in project delays for Projects 1 and 2 as well as other offshore wind projects planned around the same time. While these approaches, along with monitoring and enforcement measures, may ensure that air emissions do not exceed the bare minimum the law requires, harmful air pollution should be minimized as much as possible if the technology exists to do so, regardless of the optimal equipment leasing schedule.

Response 2.6
As a clarification, Tables 1A and 1B in the permit indicating the representative vessel types and the representative non-marine engines, are the expected representative equipment that will be used in this project. Any additional equipment not listed in those tables are not allowed by the permit. For a discussion of permit provisions addressing minimization of vessel emissions, see Response 2.1.

With regards to non-marine engines for WTG and OSS installations and during operation of the OSSs, regardless of the final specifications of non-marine engines to be used, they will have to meet the 40 C.F.R. Part 1039 Tier 4 engine emission standards. The Tier 4 standards are the highest Tier standards in Part 1039, meaning they impose the most stringent limits currently in effect for non-marine engines, which apply to a range of pollutants. *See also* Response 2.5.

Section 3.0 – Environmental Justice

Comment 3.1
I am concerned about the potential negative impacts of the current project on the state's economy, commercial fisheries, and Environmental Justice (EJ) communities on the island. Specifically, I am inquiring whether the EJ community in southern Long Beach Island, NJ has been adequately considered. There are approximately 500 trailer homes occupied by permanent or year-round residents in this area. Has there been any engagement with these residents? Although I understand that the open comments are for the OCS air permit, I believe that the EPA should consider all relevant aspects.

Ultimately, I am seeking:

1. More information about this issue. While I support clean energy, the current messaging from BOEM and the EPA to our community has been lacking.
2. Engagement in this matter. I have valuable resources and would like to be involved in discussions.

This project could have severe consequences for the Jersey Shore, and I am deeply concerned about its potential impact on our community.

Response 3.1
To address the commenter's concern, EPA has run an EJSCREEN report for southern Long Beach Island in a 5 km radius, and no Environmental Justice (EJ) indices were identified to be over the 80th percentile for both state and national comparisons. In addition, the New Jersey Department of Environmental Protection has also confirmed to EPA that the mentioned community does not have known EJ concerns. However, if the southern Long Beach Island area were to have EJ concerns, the project's distance from the shore means the project would have no disproportionate impacts to the Long Beach Island area.

Executive Order 12898 directs federal agencies to identify and address communities at risk and implement environmental justice. To this end, BOEM's ROD outlines efforts to ensure such communities were considered. Page 66 of the ROD explains that "*[d]isadvantaged communities have been identified within the vicinity of the proposed project"* and the ROD contains maps of those identified communities. The ROD indicates that "*BOEM concludes that environmental justice populations would not experience disproportionately high and adverse effects related to construction, O&M, and decommissioning of onshore infrastructure.*"

With respect to the commenter's generalized concern about potential severe consequences for the Jersey Shore and impacts on commercial fisheries, which the commenter did not identify more specifically, BOEM's ROD contains conditions related to commercial fisheries and for-hire recreational fishing at Section 6, beginning on page 147 of 208. BOEM's FEIS also considers impacts to commercial fisheries. The protection of marine mammals falls under the jurisdiction of the National Marine Fisheries Services (NMFS).

Regarding the commenter's request for more information and engagement on the issue, BOEM's ROD requires Atlantic Shores to develop and maintain a website pertaining to the project. Per BOEM's ROD (page 77 of 208), the website must be updated monthly with construction updates and other publicly important information. Additionally, the website is a place for the public to leave comments pertaining to the project.

See Response 4.1 and 4.4 for links to BOEM's ROD and FEIS.
See Response 4.29 for concerns regarding the economy.

Comment 3.2
Residents in the overburdened communities (NJ law) and EJ communities (federal designation) of Atlantic City and neighboring Brigantine are already burdened with asthma. The construction and operation debris will disrupt their breathing and the quality of life for residents in these areas. EPA's EJScreen analysis on pp. 61-62 of the Fact Sheet is flawed and contradictory.

While "Atlantic City was found to be above the 80th percentile for three indices," importantly, "if the area of interest exceeds the 80th percentile for one or more of the EJ indices, then EPA considers that the permitting action may have a high potential for EJ concerns that need to be addressed." In fact, Atlantic City's own Chelsea Condo Association, right in the epicenter of the proposed OSSs in Atlantic City, is shown to have 80-90% Asthma impacts on the EPA's EJScreen Environmental Justice Mapping Tool. There are 16 Air Pollution Sites reporting to EPA within the defined area, an overwhelming number of polluted areas - not to mention the 6 Brownfields, 1 Toxic Release Inventory and 12 Water Discharges. It should be noted there are also 5 Schools and 1 Hospital that also stand to be impacted by the C&C and O&M within the defined area. The whole point of EJ mapping is to make sure that overburdened communities such as Atlantic City do not suffer disproportionate impacts due to their socioeconomic and impacted health status.

The Chelsea neighborhood may also be found on New Jersey's overburdened communities.

Please take note that Brigantine is 4.5 statute miles and downwind from Atlantic City. Similarly, Brigantine has its own overburdened community.

Response 3.2
Both Atlantic Shores and the EPA have conducted environmental justice (EJ) analyses on potential impacts to overburdened communities from the proposed project. EPA has conducted an EJSCREEN report on Atlantic City in a 5 km radius to see if any areas would be identified as being above the 80th percentile for state and/or national averages for at least one of EPA's predetermined EJ indices. As noted by the commenter, the Fact Sheet accompanying the draft permit stated that Atlantic City was found to be above the 80th percentile for three indices. The high percentage of asthma is noted.

Air quality impacts from the project are highest at the project's offshore site and diminish as the air emissions from the construction and commissioning phase approach the shoreline where potential EJ communities reside, and the air quality impacts will diminish further during the operations and maintenance phase. Additionally, because the project is located in the Wind Development Area, which is entirely located 7.6 or more nautical miles offshore and not in an overburdened community, it would not be subject to NJDEP's Administrative Order 2021-25, which implements certain requirements of New Jersey's EJ law at N.J.A.C. 7:1C. Note that the permit also contains BACT, LAER, and other requirements to limit the air emissions from the project.

EPA notes that outreach to leaders in these communities was conducted as part of the public comment process for this action, including contacting the local, state, and Congressional officials for Atlantic City (and Brigantine, discussed in this next comment) and asking them to share information about the public hearing and public comment period with their constituencies. EPA also notified local organizations that work on environmental justice issues and have expressed interest in this project in the past and asked them to share that information with their networks. Any input received from these organizations or the community were considered and are addressed in this Response to Comment document.

Please refer to Section XV ("Environmental Justice") on page 62 of the Atlantic Shores Fact Sheet that accompanied issuance of the draft permit to see more details on the EJ analysis done for the Atlantic Shores OCS project.

Comment 3.3
The Public Notice and Project documents, including Fact Sheet and Draft Permit, state that EPA must consider New Jersey law. Under the construction and maintenance of the Projects as described in the Public Notice and Fact Sheet, there are significant adverse air polluting and other horrible environmental effects, with the real possibility of serious violations. As such, the facilities described under the Public Notice and Project documents will act as major sources of air pollution and other emissions that run afoul of New Jersey law, in so many ways. For example: The Project neither avoids disproportionate impacts on the New Jersey state protected overburdened communities ("OBCs") of Atlantic City and neighboring Brigantine, nor does it serve a compelling public interest, when its known health and pollution effects are too high and others need to be further studied. In effect, the environment and its population will be irreparably harmed to build and service such a Project.

Response 3.3
The commenter does not specifically identify "the significant adverse air polluting and other horrible environmental effects" about which they are expressing concern, and how specifically the emissions from this project run afoul of New Jersey law. However, limiting the permitted project's emissions has been a priority throughout the permitting process, and the permit contains conditions intended to accomplish this. In addition, the air quality analysis provided as part of the permit application shows that the maximum daily and annual emissions that will result from the project meet Clean Air Act NAAQS and PSD Increment requirements. This ensures that economic growth will occur in harmony with the preservation of existing clean air resources, while protecting public health and welfare. *See* Response 2.2. The C&C and O&M phases of the project will result in air emissions, primarily from the marine vessels that are required for the construction and maintenance of the offshore components of the project. For a further discussion of the marine vessel emissions, *see* Section 2 of this document.

See Response 3.2 for explanation of the environmental justice screening that both Atlantic Shores and the EPA undertook, including the environmental justice analysis conducted for Atlantic City. Regarding the municipality of Brigantine, an EJSCREEN report was conducted in a 5 km radius around Brigantine, and one EJ index, "Drinking Water Non-Compliance," was found to be above the 80^{th} percentile for state and national levels. It is unlikely that the OCS project subject to the OCS air permit will have an impact on this EJ index level; in other words, the offshore construction, operation, and maintenance of the wind farms is unlikely to affect drinking water.

For additional discussion of the project's impacts on human and environmental health (such as air quality, water quality, economics, coastal fauna, and recreation), including considering impacts to any overburdened communities, *see* BOEM's ROD and FEIS. Links to the ROD and FEIS can be found in Responses 4.1 and 4.4.

Section 4.0 – Impacts on Marine Mammals, Ocean, Wildlife Environment, Tourism, Property Values, Noise, and Other Impacts

Many of the issues raised in the comments below are either outside the scope of this permitting action and/or fail to provide information sufficient for EPA to provide an informed response. EPA provides these responses for informational purposes only.

Comment 4.1
Although the permit seems to meet the Clean Air Act requirements, it should not be approved since the sonar mapping off the coast that is required for these projects is causing the slaughter of marine mammals such as whales, dolphins, porpoises, and marine reptiles such as sea turtles.

Response 4.1
The protection of marine mammals falls under the jurisdiction of the National Marine Fisheries Services (NMFS). *See* BOEM's Record of Decision (ROD) at https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Atlantic%20Shores%20South%20ROD.pdf to review how the NMFS has addressed its responsibilities with respect to the protection of marine mammals and sea turtles. Section 5: Protected Species and Habitat Conditions starting on page 105 of 208 in the ROD contains conditions related to marine mammals and marine reptiles such as sea turtles. BOEM also discusses impacts to marine mammals and marine reptiles such as sea turtles in its Final Environmental Impact Statement (FEIS). *See also* Response 4.10. *See* Response 4.4 for a link to the FEIS.

Comment 4.2
These proposed 200 turbines that run on fossil fuels only 8.4 nautical miles from the beach is beyond unimaginable, to our Ocean, our wildlife, and our way of life.

The Project's wind turbines are already determined to be air polluting by EPA.

Response 4.2
The wind turbine generators (WTGs) being installed as part of this project will not run on fossil fuels. The WTGs will run on wind energy, and will use energy from the wind to generate electricity. EPA notes, however, that the offshore substations will have up to eight backup generators (one each) that will burn ultra-low sulfur fuel and will each operate no more than 500 hours/year. These backup generators will be used by the offshore substations for emergency power at those times, if any, when the connection to the grid is lost.

For issues related to the ocean and wildlife, and which other federal agencies with jurisdiction in these and other areas to address them, *see* Response 4.1. This response also has a link to BOEM's ROD.

Comment 4.3
These monopiles will destroy the Ocean floor with their football-sized concrete beds, and with that goes all the homes of our shellfish, clams, and crabs and our fisherman.

Response 4.3
Clams and crabs are both types of shellfish. Shellfish habitat protection is under the jurisdiction of the US Army Corp of Engineers and specific conditions related to shellfish can be found in Section 5.3.7.2. of BOEM's Record of Decision on pages 64 to 68 out of 208; shellfish impacts are also discussed in BOEM's FEIS. With respect to mitigating any impacts the project is expected to have on commercial fisheries and for-hire recreational fisherman, please see the implementation of the Direct Compensation Program also found in BOEM's Record of Decision. *See* Response 4.1 and 4.4. for links to BOEM's ROD and FEIS.

Comment 4.4
The EMF from underwater electrical cables is dangerous, poses serious health risks and will literally electrify our beaches and ocean floor when they are unearthed due to wear and tear, which is already happening in New England.

Response 4.4
Electromagnetic field (EMF) impacts from electrical cables are outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act. For a discussion of the EMF impacts from underwater cables associated with this project and how they are addressed, *see* BOEM's Final Environmental Impact Statement (FEIS) at https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/AtlanticShoresSouth_Vol1_FEIS.pdf.

Comment 4.5
Strongly opposed to any plans to industrialize our oceans. There have not been any long-term studies on the damage to our ecosystems, fishing industries, sea life, navigation difficulties, etc.

Response 4.5
These issues are outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act. We note, however, that many of these issues are discussed and addressed in BOEM's FEIS and Record of Decision, *see* Responses 4.4 and 4.1, respectively, for the links to access these documents.

Comment 4.6
Not in favor of wind turbines on our oceans since they are dangerous to birds, whale migration and sea life. Also, noise pollution and ugly to look at.

Response 4.6
The issues raised by the commenter are addressed in the Record of Decision (ROD), such as in requirements for the applicant to develop and submit for approval a Bird Perching Deterrent Plan (ROD, page 109 of 208); a plan to minimize impacts to marine mammals (ROD, page 128 of 208, among others); and to use noise abatement systems (ROD, page 133 of 208) during all foundation pile-driving in a manner that achieves the maximum noise attenuation levels practicable. *See* Response 4.1 for the link to access the Record of Decision. Also, *see* Response 8.1 for an additional response on noise and *see* Response 10.5 for additional response on wind turbine visibility from shore.

Comment 4.7
Offshore wind is an abomination and disaster for our oceanic ecosystem. The damages will forever be felt.

Response 4.7
Please refer to BOEM's Final Environmental Impact Statement and Record of Decision for discussion of the project's possible impacts, including on the ocean's ecosystem, and how they are being addressed. *See* Responses 4.1 and 4.4 for the links to access these documents.

Comment 4.8
Opposed to any ocean wind farm along the East Coast. Industrialization of our ocean is good for nobody and does not change the carbon emissions. All it is doing is wrecking a natural resource and killing everything that lives in it. It is not clean or clean energy.

Response 4.8
Regarding the ocean ecosystem *see* Response 4.7. Regarding carbon emissions, *see* Responses 4.23 and 4.28.

Comment 4.9
Commenter provides a copy of certified resolution passed unanimously by the Borough of Seaside Park's governing body at its recent July 18, 2024 regular public meeting. Commenter describes the resolution as expressing some of the many issues that the commenter states have never been subject to an adequate scientific investigation, or a realistic cost-benefit analysis, as to the negative effects upon the environment, costs and fees imposed upon ratepayers and taxpayers. Commenter states that one of the most outrageous inadequately researched aspects of such massive industrialization off the coast concern the fact that the cumulative impact of such industrialization will condemn the North Atlantic right whale to extinction.

Response 4.9
For responses to specific items in the Borough of Seaside Park's resolution, *see* Responses 4.10, 4.25, 4.26, 4.27, 4.28, and 4.30.

Comment 4.10
Studies establish that the testing, construction, and operation of the Industrial Offshore Wind Project, though sold as green energy, has and will significantly damage the environment. There is little doubt it has and will continue to negatively impact the behavior of marine fish and mammals, including causing confusion, compelling them to swim ashore, and preventing them from diving and feeding (since the start of sonar surveying and seismic testing an unprecedented number of marine mammals have washed ashore and died). There is also no question it will cause significant environmental and wildlife damage onshore.

Response 4.10
It is not clear how these comments pertain to this permitting action. In addition, the commenter did not include or identify any specific recognized studies to support the above statements. BOEM's FEIS and ROD include discussions of potential impacts on marine mammals, and requirements relate to mitigating impacts; the ROD discussion begins on page 105 of 208, under Section 5: Protected Species and Habitat Conditions. *See* Responses 4.1 and 4.4, including for

links to the FEIS and ROD documents. In addition, according to the National Oceanic and Atmospheric Administration (NOAA) Fisheries website, "there are no known links between large whale deaths and ongoing offshore wind activities" and "[a]t this point, there is no scientific evidence that noise resulting from offshore wind site characterization surveys could potentially cause whale deaths." *See* https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/frequent-questions-offshore-wind-and-whales.

Comment 4.11
Numerous attempts to spread misinformation concerning a correlation between whale necropsy findings and offshore wind development are being "fueled" by fossil fuel industries and their political proponents. The greatest threat to marine life is climate change. As ocean surface temperature continues to rise, (now at its highest since initial records), food sources for marine mammals have moved closer to the coastline. The likelihood of becoming entangled in fishing gear or being in the path of cargo ships increases as these mammals search for their food.

Response 4.11
This comment lacks specificity and it is not clear how the comment pertains to this permitting action. Please refer to BOEM's Final Environmental Impact Statement and Record of Decision for discussion of the project's possible impacts, including on the ocean's ecosystem, and how they are being addressed. *See* Responses 4.1 and 4.4 for the links to access these documents.

Comment 4.12
Research has shown that wind farms act as artificial reef systems and may improve fishing. Whale strikes are more likely caused by boat strikes. How many whales will we kill with oceans that are too warm to sustain their food sources.

Response 4.12
This comment lacks specificity and it is not clear how the comment pertains to this permitting action. Please refer to BOEM's Final Environmental Impact Statement and Record of Decision for discussion of the project's possible impacts, including on the ocean's ecosystem, and how they are being addressed. *See* Responses 4.1 and 4.4 for the links to access these documents.

Comment 4.13
The University of Rhode Island showed that since mammals use the natural Electric and Magnetic Fields, EMF-s changes were detected in their behavior. The risk varies greatly by species.

If anyone responsible for this project has any environmental impact studies, to the contrary, please disclose. Again, where is the transparency?

Response 4.13
It is not clear how these comments pertain to this permitting action. Further, the commenter does not specifically identify the research they cite such that EPA can identify it with certainty.

However, an online search for the study identified by the commenter resulted in the following link, which may be the information referenced by the commenter[1]:

https://web.uri.edu/offshore-renewable-energy/ate/how-do-electromagnetic-fields-affect-marine-animals/

According to the article at the URI link, some marine species may have both magnetoreceptive and electroreceptive physiology. However, it appears that no conclusions resulted from the study other than "more research is needed to determine: 1) how species encounter and perceive cable EMFs throughout their lifetime and 2) how cable EMFs are present to marine species and vary with cable properties. Advancing this knowledge base will require a multidisciplinary approach and stakeholder involvement."

As far as we are aware, no one has provided to EPA any additional research related to the issue raised by the commenter. BOEM discusses EMF, including impacts on marine mammals, in the FEIS. *See* Response 4.4 for a link to BOEM's FEIS. *See also* Response 4.1 and 4.10 for additional discussion of impacts on marine mammals.

Comment 4.14
Not only does it pain me to think of the animals and marine life that have been and will be affected by this project (mysteriously many dead animals washing ashore while testing was being done apparently means nothing to anyone involved) but the fact that it will absolutely ruin the appeal of Long Beach Island that we all know and love.

Response 4.14
See Response 4.10.

Comment 4.15
What's to become of the fishermen that make their living off of the sea here when you disturb the entire ecosystem?

As an environmental protection agency, you should be doing just that - protecting the environment, not destroying it for offshore wind that's been proven ineffective. Not to mention the climate of NJ. When the turbines fill with ice, what will you use to de-ice them? Chemicals. Filling the ocean and poisoning the wildlife.

Response 4.15
See Response 4.3 regarding fishermen. As a result of this comment, EPA asked Atlantic Shores about any possible use of de-icing chemicals on the turbine blades. Atlantic Shores responded that it does not anticipate the use of de-icing chemicals on the wind turbine blades, and as such, it was not discussed in the Final Environmental Impact Statement (FEIS) or Record of Decision (ROD). Therefore, the use of de-icing chemical is not allowed by the ROD.

Comment 4.16
The project will adversely affect the citizens' livelihood on-shore communities near the water, vessel traffic, water quality, property values, and even human enjoyment of the coast.

[1] The URI link in turn references an article in Oceanography magazine, *available at* https://tos.org/oceanography/article/the-interaction-between-resource-species-and-electromagnetic-fields-associated-with-electricity-production-by-offshore-wind-farms.

Response 4.16
Expected and possible impacts from the project of the types raised by the commenter are discussed and addressed in BOEM's Final Environmental Impact Statement and the Record of Decision. *See* Responses 4.1 and 4.4 for the link to these documents.

Comment 4.17
The noise that the turning of the blades produces is well documented in many illnesses as the root cause for the unfortunate people that live near these monstrosities.

Response 4.17
Although the commenter does not identify any specific documentation, EPA assumes that the commenter is referring to reports of some type related to noise produced by wind turbine projects on land unrelated to this project. The wind turbine generators from this project that will be nearest to shore will be located approximately 7.6 nautical miles (8.7 statute miles) from the NJ shoreline. At this distance, it is unlikely for any noise from the turbine blades to be heard by communities onshore.

Comment 4.18
These foreign developers have no accountability for their maintenance and have and will pose National Security risk by interfering with radar and sonar. They also violate the FAA regulations for height requirements.

Response 4.18
This comment is outside the scope of this permitting action under the Clean Air Act. However, we note that the application states that Atlantic Shores is a 50/50 joint venture between EDF-RE Offshore Development, LLC (a wholly owned subsidiary of EDF Renewables, Inc.) and Shell New Energies US LLC. *See* BOEM's Record of Decision for discussion of the protection of national security of the United States related to the project. The Construction and Operations Plan (COP) submitted by Atlantic Shores for BOEM's review indicates the project will meet all Federal Aviation Administration (FAA) requirements for aviation and radar interference. To the extent the commenter is concerned about air emissions resulting from maintenance of the offshore wind farms, such maintenance for the project will be subject to emissions limitations and other requirements under this OCS air permit.

Comment 4.19 (2,
Commenter supports the project because of many reasons such as cutting our fossil fuel reliance, achieving the necessary carbon emission reductions to protect our communities from the climate crisis (e.g., severe rain, sea level rise, devastating hurricanes, and other extreme weather events), creation of new jobs, stable new source of tax revenue, etc.

Response 4.19
Commenter did not raise a specific issue that requires a response by EPA.

Comment 4.20 (4,
Please consider the recent events with Vineyard 1 blade catastrophe as a gauge for the future of NJ with any offshore wind installations. This power plant barely made it 6 months before it

failed leaving a trail of shrapnel in its wake.

Response 4.20
These issues are outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act. We note that this issue appears to be limited to a certain number of defective blades from the GE Vernova turbine equipment supplier, which was used for the Vineyard Wind 1 project. Atlantic Shores has announced its selection of Vestas as their preferred turbine equipment supplier for Project 1. *See* https://atlanticshoreswind.com/atlantic-shores-selects-vestas-as-preferred-turbine-supplier-for-its-1-5-gw-project-in-new-jersey/. Atlantic Shores has not yet announced a preferred turbine equipment supplier for Project 2.

On July 17, 2024, the Bureau of Safety and Environmental Enforcement (BSEE) issued the following statement on this issue:

> *Following the July 13, 2024, blade failure incident at Vineyard Wind, BSEE has issued a Suspension Order to Vineyard Wind to cease power production from all its wind turbine generators until it can be determined whether the blade failure affects any other VW turbines. The Suspension Order suspends power production on the lease area and suspends installation of new wind turbine generator construction: Those operations will remain shut down until the suspension is lifted. BSEE has also issued a Preservation order to safeguard any evidence that may be relevant to determining the cause of the incident. As of this date, there are no reported injuries or harm to any marine resources or mammals from the incident. BSEE is onsite with Vineyard Wind as investigations are underway. BSEE will conduct an independent assessment to ensure the safety of future offshore renewable energy operations.*

Comment 4.21 (14,
Commenter urges EPA to implement a no action alternative and to impose an immediate moratorium as to the pending joint application for further offshore wind turbine pre-construction or construction activities off of New Jersey coast. At the very least, an immediate moratorium on this industrialization of the ocean should be imposed while an ongoing independent investigation by the Government Accountability Office (GAO) is being conducted. It is inevitable that such a study and audit by this congressional watchdog will recommend further scientific research and a more comprehensive and independent cost-benefit analysis as to the hazards and irreparable harm posed by the Atlantic Shores combined project and the similar massive industrialization projects of other wind turbines proposed to be located in the Atlantic Ocean, in a major hurricane and northeast storm zone, off New Jersey's precious shores.

Response 4.21
EPA is obligated under the Clean Air Act (CAA) to make a final permit decision (grant or deny) on a submitted permit application within one year of the determination that the application is complete. If the proposed facility would violate the provisions of the PSD or nonattainment New Source Review regulations, EPA must deny the permit. If it meets the applicable requirements, EPA must issue the permit. A no action alternative (i.e., not acting on a complete permit application) is not an option under the CAA. While the commenter expresses generalized concerns regarding the impacts of this project, it does not identify specific harms that EPA may

address here. EPA notes that BOEM's Record of Decision and BOEM's Final Environmental Statement, referenced in Responses 4.1 and 4.4, both discuss BOEM's consideration of a no action alternative for this project. To the extent the commenter seeks an immediate moratorium on all offshore wind development, this comment is beyond the scope of the current permitting action. To the extent this comment seeks investigation by the Government Accountability Office, this comment is also outside the scope of this permitting action. With respect to the cumulative impacts of this project and other wind farm projects, *see* Response 5.18.

Comment 4.22 (14,
The entire process is flawed, and there has been inadequate review and investigation as to the cumulative direct and indirect impacts of this massive industrialization proposed off of New Jersey. There exists extreme danger for irreparable harm to our environment, the recreational and commercial fishing industries, our tourism industry, and the very nature, character, and history of the Jersey shore.

Response 4.22
For information on how EPA addresses cumulative impacts from various wind farms, *see* Response 5.18. Also *see* Responses 4.1 and 4.4.

Comment 4.23 (14,

As BOEM itself has acknowledged and admitted in its final environmental impact statement for the equally reckless and less massive wind turbine project of Vineyard Wind, "Overall, it is anticipated that there would be no collective impact on global warming as a result of off wind project...."

As if any further proofs were needed as to the foolish nature of proceeding with such environmentally devastating and overwhelmingly costly projects, the July 13th incident involving the catastrophic failure of one of the Vineyard Wind turbine blades underscores the emergent need to implement an immediate moratorium and pause on this rubber-stamped fast-tracked massive industrialization of our precious ocean. As you should be aware, the devastating aftereffects of the washup of the non-biodegradable shards of the blade have shut down six Nantucket, Massachusetts beaches and have caused untold and incalculable financial and environmental costs and impacts. This incident occurred on a virtually windless day and not even during a storm event.

Response 4.23
Each individual wind farm project has its own individual Final Environmental Impact Statement. Therefore, the FEIS for Vineyard Wind is not the same as the one for this project. A link to the FEIS for this project can be found in Response 4.4. The FEIS (page 557 of 560) states that BOEM anticipates that the long-term benefits of this project include that it will reduce greenhouse gas emissions, that one of the benefits of the project is:

> *Promotion of renewable energy to help ensure geopolitical security, reduce GHG emissions to combat climate change, and provide electricity that is affordable, reliable, safe, secure, and clean[.]*

Similarly, BOEM's ROD (page 50 of 208) states:

> *The Projects will help both the United States and New Jersey achieve their renewable energy goals, diversify the State's electricity supply, increase electricity reliability, and reduce greenhouse gas (GHG) emissions.*

Also, *see* Response 4.20 for additional information on the blade incident in Massachusetts.

Comment 4.24 (21,
How do you expect people to rent on an island where you have offensive wind turbines gaping the shoreline. You will crush the tourism here that the island is built on. No one wants to look out at a vast and beautiful ocean dotted with horrendous wind turbines. Not to mention how close they will be to shore.

Response 4.24
The issues raised by the commenter do not fall under the purview of the Clean Air Act. For issues related to tourism and the economy, *see* Response 4.39. Regarding visual impacts, *see* Responses 4.25 and 10.5.

Comment 4.25
The Industrial Offshore Wind Project turbines include up to 300 massive wind turbine structures (each as high as 1000 ft+ and as wide as 900 ft+). The closest turbine structures will be located approximately 8.5 miles from the coast and clearly visible to residents and tourists who live or travel to the Shore for the environment, unspoiled views, and way of life.

In 2006-2008, when the areas were designated for offshore wind energy, proposed tower heights were approximately 200 to 400 feet and rotor diameters were under 328 feet. By analogy, when the plan was hatched essentially 300 single-family houses were to be built at the Shore and it is now a proposal for a cityscape comprised of 300 immense and imposing skyscrapers.

Response 4.25
The OCS permit allows the construction and operation of up to 200 offshore wind turbine generators, not 300. Regarding the commenter's concerns regarding the visibility of the wind generator structures onshore, these are addressed on page 59 of BOEM's Record of Decision (ROD), which states the following:

> *The primary detriment of implementing this project is the immutable visibility of the structures, especially in combination with other planned facilities in the vicinity. The offsetting benefits to economics, energy need, environmental integrity, and offsetting land-based energy production outweigh that detriment and reflect a long-term investment in the needs and welfare of the people.*

See Response 4.1 for a link to BOEM's ROD.

Moreover, although the proposed project will be visible from shore at certain times, this visibility will often be limited due to atmospheric conditions. In fact, the FEIS concludes that at the closest

analyzed Key Observation Point (KOP), turbines would only be visible for approximately half of the year.

Further discussion on the visibility of the project can be found in the FEIS, *see* Response 4.4 for a link to the FEIS, and in Section 5.0 of Volume II of the Atlantic Shores Offshore Wind Construction and Operations Plan (COP), including proposed environmental protection measures to effectively reduce the potential visual impacts as practicable given the nature of the technology and the location of the project. For a copy of the COP submitted by Atlantic Shores, *see* https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/AtlanticShoresSouth_Volume%20II_AffectedEnvironment_05-01-2024_rev1.pdf. The full Visual Impact Assessment included as Appendix II-M1 of the COP is *available at* https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/2024-05-01_Appendix%20II-M1_VIA.pdf.

For additional discussion regarding the Coastal Zone Management Act (CZMA), *see* Response 10.5.

Comment 4.26
An independent analysis concludes that the cost of the Industrial Offshore Wind Project will exceed $100 billion and raise electric customer rates by 55% for residential customers, 70% for commercial customers, and 85% for industrial customers. For context, in 2024 wholesale power purchase prices are roughly $55 dollars per megawatt-hour, whereas the Board of Public Utilities recently approved contracts for offshore wind with a price of $144 per megawatt-hour. In addition, the costs associated with transmission upgrades to distribute the electricity are forecast to increase progressively from $1 per megawatt-hour to roughly $40 per megawatt-hour by 2047.

Response 4.26
This comment regarding the cost of electricity is outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act. EPA also notes that the commenter did not provide or identify the independent analysis mentioned.

Comment 4.27
Studies establish that the Industrial Offshore Wind Project will convert a pristine public natural and economic resource into a mammoth industrial eyesore in exchange for a catastrophic loss in tourism revenue, jobs, and property values, and, therefore, will be a significant economic burden imposed upon all State residents. A 2024 study prepared by Tourism Economics, an Oxford Economics Company ("Oxford Report"), establishes that the Offshore Wind Project will cause losses for the Long Beach Island municipalities of approximately 835,000 annual visitors, $450.2 million in tourism spending, a total economic impact (loss) of $668.2 million, and a total loss of State and local tax revenue of $80.3 million. Studies further show at least 25% of beachgoers would switch beaches to avoid the visual blight cause by the Industrial Offshore Wind Project. Moreover, as admitted by the federal government, the fishing industry will be diminished by the resultant navigational hazards, habitat conversion, fish aggregation, migration disturbances, and space-use conflicts.

Response 4.27
See Response 4.39 for concerns regarding tourism and the economy.
See Response 4.1 for concerns regarding the fishing industry.
See Responses 4.25 and 10.5 for concerns regarding visual impacts.

Comment 4.28
Studies support the conclusion that the Industrial Offshore Wind Project will not reduce global warming or CO_2 emissions. In fact, Harvard University found that the installation of scores of wind turbines in concentrated areas will actually raise surface temperature, especially in the immediate area of the turbines. The Harvard researchers concluded "[t]he direct climate impacts of wind power are instant, while the benefits of reduced emissions accumulate slowly. If your perspective is the next 10 years, wind power actually has - in some respects - more climate impact than coal or gas." Further, the Oxford Report establishes that offshore wind energy production is the most expensive form of renewable energy produced on a large-scale.

Response 4.28
The commenter does not identify with specificity the research being referenced. It appears the commenter may have intended to reference and quote from a *Harvard Gazette* news story available at https://news.harvard.edu/gazette/story/2018/10/large-scale-wind-power-has-its-down-side/. The article references two papers published by Professor Keith and by Lee M. Miller, *Climate Impacts of Wind Power*, 2 Joule 2618 (2018) and *Observation-Based Solar and Wind Power Capacity Factors and Power Densities*, 2018 Environ. Res. Lett. 13 104008[2]. Both papers examined aspects of onshore wind power generation unrelated to the emission of air pollutants from such projects.

The comments and research raised by the commenter, which concern climate and other impacts of wind energy, are outside the scope of this permitting action. Under Clean Air Act section 328, Congress mandated that EPA regulate air pollution from OCS sources. Implementing regulations at 40 C.F.R. Part 55 outline the OCS air permitting program. EPA is issuing this OCS air permit because it meets those requirements and contains the air emissions limitations and related requirements necessary pursuant to the Clean Air Act and its implementing regulations.

Comment 4.29
Our government is more worried about the money they will make than the environment and economy they are responsible to protect.

Response 4.29
EPA's role is to ensure that the proposed project meets all applicable Clean Air Act requirements. The Clean Air Act does not regulate the issues raised by this commenter. For concerns regarding the economy, page 23 of BOEM's ROD states the following:

> *Impacts of the Proposed Action when combined with the impacts from ongoing and planned activities, including the connected action and other offshore wind activities,*

[2] This article was later corrected by Lee M Miller and David W Keith, *Corrigendum: Observation-based solar and wind power capacity factors and power densities*, 2019 Environ. Res. Lett. 14 079501 ("An error in the estimate of wind plant area led us to underestimate wind power densities by about 40%.").

*would be **minor adverse** and **moderate beneficial**. The beneficial impacts would primarily be associated with the investment in offshore wind, job creation and workforce development, income and tax revenue, and infrastructure improvements*.

See Response 4.1 for a link to BOEM's ROD. Also*, see* Response 4.39.

Comment 4.30
The sole conclusion is that the Industrial Offshore Wind Project is designed to be funded by all State residents and businesses, significantly higher electricity rates and significant loss of jobs and tax revenue, will cause environmental and wildlife devastation will irreparably damage the tourism, fishing industries, and overall State economy in the form of higher overhead energy costs, will not produce actual green energy. and the State's residents will be left to pay for the removal of or live with the massive, decaying turbines. Indeed, if it is built, the State's residents will trade their priceless and pristine natural and hard-earned economic resources for a significantly higher cost of living and significantly lower quality of life and environment, and, incredibly, without the purported green energy benefits.

Response 4.30
Commenter expresses generalized concern about the environmental, economic, and wildlife impacts of this project. The comment is not specific enough to enable EPA to respond. However, EPA notes that EPA's role in this proceeding is to ensure that the proposed project meets all applicable Clean Air Act requirements. The remainder of this comment both lacks specificity *and* is outside the scope of the Clean Air Act. However, regarding the project's funding, EPA notes that, as stated in the application, Atlantic Shores is a 50/50 joint venture between EDF-RE Offshore Development, LLC (a wholly owned subsidiary of EDF Renewables, Inc.) and Shell New Energies US LLC, two private entities. EPA also notes that, with regards to employment and economics, page 59 of BOEM's ROD states the following:

The Project is designed to meet in part the need for competitively priced renewable energy and additional capacity in accordance with State and regional renewable energy demands and goals. Under the New Jersey Offshore Wind Development Act (OWEDA), the NJBPU is required to establish an OREC program requiring a percentage of electricity sold in the state be derived from offshore wind energy, in order to support at least 7,500 MW of generation from qualified projects. On June 30, 2021, the NJBPU selected the Atlantic Shores Offshore Wind South project to develop the offshore wind energy facilities proposed in these applications. In terms of the private need, in addition to providing financial gain to the companies investing in the project, the final EIS indicates that the project would have a minor beneficial impact on employment and economics.

For information on how this project meets the Clean Air Act, *see* Response 2.2.
For additional comments on the economy and tourism, *see* Response 4.39.
For comments on fishing impacts, *see* Response 4.1.
For funding of the decommissioning phase, *see* Response 8.3.

Comment 4.31
I wish to express my support for the Permit, provided that Atlantic Shores Offshore Wind Project 1, LLC follows all environmental guidelines as laid out in the Permit documentation. I believe that the resulting emissions, which will not violate National Ambient Air Quality Standards, are acceptable in exchange for the clean energy that the offshore wind projects will provide to the State of New Jersey upon their completion. The Atlantic Shores projects are crucial to helping NJ reach its clean energy goals, and aside from the environmental improvements that will come from the generation of clean offshore energy, the projects will doubtless create jobs and bolster NJ's clean-energy economy.

Response 4.31
EPA appreciates the commenter's support of the proposed action. For additional discussion of the economy and tourism, *see* Response 4.39.

Comment 4.32
I fully support and am an advocate for offshore wind development, in particular, the proposed Atlantic Shores Offshore Wind Projects 1 &2. Transitioning now to clean, renewable energy is a necessity if we hope to survive the climate crisis. NJ coastal communities and states across the entire Northeast have continued to experience severe flooding, rising sea level, eroding coastlines, hurricanes and other extreme weather conditions because of our reliance on fossil fuels as our energy source. "Natural" gas plants are anything but that. They are methane plants, 85 times more potent than CO_2 after it is released into the atmosphere with 93% of that heat being absorbed by our oceans. We know that climate events seriously impact our economy. According to a climate assessment group, E2, climate-related disasters have cost NJ $59 billion dollars since 1980. Already major homeowners' insurance companies are deciding not to sell new homeowners policies because of the catastrophic risks caused by climate change. The severity and frequency of these storms puts a strain on utilities and of course on the health and safety of our overburdened communities.

Response 4.32
EPA appreciates the commenter's support of the proposed action and although this comment does not require a response, EPA notes that the project's purpose and need for the project, as provided by the applicant and reviewed by the US Army Corp of Engineers, "will help both the United States and New Jersey achieve their renewable energy goals, diversify the State's electricity supply, increase electricity reliability, and reduce greenhouse gas emissions." *See* BOEM's ROD at page 50 of 208. Comments related to insurance companies are beyond the purview of this permit. For additional comments on the economy, *see* Response 4.39.

Comment 4.33
We have the unique advantage of being a coastal state, ideal for utilizing wind power. The wind projects will generate enough clean electricity to power millions of homes and create thousands of new jobs thereby significantly boosting NJ's economy. Time is running out. It is the height of irresponsibility **not** to recognize a climate emergency both for ourselves and future generations. We must move off fossil fuels now and invest in the clean, renewable energy of offshore wind.

Response 4.33
This comment does not require a response from the EPA.

Comment 4.34
We need more renewable energy sources to meet our (mandated state) goal of 35 percent of the electricity sold in the state to come from renewable sources by 2025. Wind farms are an inexhaustible source of renewable energy and will also create jobs. I don't think wind farms a mile offshore will be visible on most days and will not impact tourism at the shore, except when I boycott Ocean City and Cape May for their selfish behavior and short-sighted politicians. According to the New York Times recent article: The state consumes more power than it produces within its borders and imports electricity from nearby states through the regional grid.

Response 4.34
This comment does not require a response from the EPA, except to clarify that the lease area for this project starts about 7.6 nautical miles (8.7 statute miles) from the New Jersey shore.

Comment 4.35
I urge the EPA to approve the Air Quality permit for the Atlantic Shores Offshore Wind Project on a timely schedule without delay. I acknowledge that there will be some short-term air pollution from fossil-fuel-powered boats and construction vehicles. However, I expect that this will only be for the first year or so. After construction is complete the only source of air pollution will be yearly maintenance. This project is planned to operate for at least ten years. The Atlantic Shores Wind Project will be a key step forward in moving the state of New Jersey from fossil fuel powered electricity to clean, non-polluting renewable energy. Long term, it will be good for air quality.

Response 4.35
This comment does not require a response from the EPA. As a point of clarification, the application states that construction of the project is expected to last about two years and the operation and maintenance (O&M) phase of the project is projected to last up to 30 years.

Comment 4.36
It is egregious to me that EPA thinks it is okay to run a 6400-megawatt cable past our homes and schools. People say they are for the project, tell them the cable is going past their house and see how they feel then. It should not be done until the communities are guaranteed they are safe.

Sea Girt Army camp has been chosen as the location for the cable reaching land. It is not a large field, instead it is a small area where children have sporting events and the State Troopers train located in between residential neighborhoods. The BPU does not even guarantee that is where the cable is going. In spring, I spoke to the men testing the soil on Sea Girt's side of the fence. What about the state endangered birds that have been sighted in that area? The children who play at the little league field and in the army camp? The families who live on the cable route? There has to be a better way.

Response 4.36
The OCS air permit does not regulate the onshore components related to this project. It only regulates offshore activities regulated by section 328 of the Clean Air Act. However, we note

that the total expected output from the Atlantic Shores project (Project 1 & Project 2) is designed to be approximately 2,840 MW.

Comment 4.37
Sea Girt is home to only one of four maritime forests (Crescent Park) that are in New Jersey. It is 17 acres and is located only one block from the beach. It is home to countless species; it is the only bird migratory stopping place from Sandy Hook to Long Beach Island. Shouldn't we take more time to study the effects that pile driving our seabed and the air pollution that the construction phase will create?

Response 4.37
The permit contains terms applicable to air emissions from the C&C phase of the project. An environmental analysis of the project (including components subject to the OCS air permit, as well as components such as onshore components that are outside the scope of the OCS air permit) has been conducted by BOEM, including analysis of air impacts and impacts on birds and other wildlife. *See* Response 4.4 for a link to BOEM's FEIS. *See* Responses 4.42 and 4.6 for discussion regarding bird impacts. *See* Response 4.1 for a link to the ROD.

Comment 4.38
The wind turbines and the power cables both create HEAT.

According to wind-watch.org, buried cables for offshore turbines can generate enough heat to raise the temperature of the surrounding ocean sediments by as much as 20 C degrees within 1.2-2 ft of the cable. The more power generated through the offshore turbines, the more energy generated is transferred through the cables coming on land. Do we really want to start heating our streets now with 6400 megawatts of power?

A Harvard study published in the academic journal, Joule, stated that wind turbines cause significant local increase in surface temperatures where they are located. The heat exchange from turbines' cooling systems can increase localized water temperature. Wind turbines also cause local temperature increases on the surface and pull-down warmer air from as far as 1,640 feet, warming the surface of the earth! This impacts, people, plants, and animals living near the turbines. Mammals and fish that like warm water are drawn to the area around the cables. When 'cold pools' come in, they are shocked. Need I say more? The more power generated through the offshore turbines the more energy generated is transferred through the cables.

Response 4.38
It is not clear how this comment pertains to this permitting action. *See* Response 4.54 regarding concerns about cables transmitting heat. *See, e.g.,* Responses 4.1, 4.3, 4.10, and 4.55 regarding impacts on wildlife. *See* Response 4.28 regarding the Harvard study.

Comment 4.39
How do you expect people to rent on an island where you have offensive wind turbines gaping the shoreline. You will crush the tourism here that the island is built on. No one wants to look out at a vast and beautiful ocean dotted with horrendous wind turbines. Not to mention how close they will be to shore.

Response 4.39
This comment is outside the scope of this permitting action. For concerns regarding tourism, page 27 of BOEM's Record of Decision (ROD) states the following:

> *The Proposed Action would result in **minor adverse** and **minor beneficial** impacts on recreation and tourism. Adverse impacts are primarily due to anchoring, land disturbance, lighting, cable emplacement and maintenance, noise, traffic, and the presence of structures. Beneficial impacts are primarily due to the presence of structures and the potential for the artificial reef effect.*

See Response 4.1 for a link to BOEM's ROD.
See Responses 4.25 and 10.5 regarding visibility and distance to shore and the CZMA.

Comment 4.40
One of the most significant concerns of this project centers on the potential use of the Sea Girt National Guard Training Center as a location in which wires would enter the land. The specific area in which they would reach land fall is a designated area for the endangered Piping Plovers. The NJDEP has purportedly sought to protect this endangered species in this area in which they nest. The disruption that will be caused in bringing these wires on shore will eclipse any activities that the NJDEP has previously expressed concerns over or prohibited.

Once they have cut through the beach to install these wires, there are proposals to run the wires and conduits underground but through the Borough streets. The Borough strenuously objects to this. Our infrastructure and access to that infrastructure could be adversely impacted by this proposal and similar proposals. Moreover, this would be highly disruptive to the citizenry living nearby.

Response 4.40
This comment concerning impacts from onshore construction is outside the scope of this OCS air permit. *See* Response 4.36.

Comment 4.41
Recently, we've seen firsthand what can happen if there is an issue or damage to a turbine. Beaches in the Nantucket/Matha's Vineyard area have been shut down due to fiberglass on the sand and debris from the turbine. In addition, there is the possibility of oil being discharged into the ocean if a turbine is damaged.

Have the possible long term and long reaching effects of these proposed offshore wind farms been sufficiently studied?

Response 4.41
See Response 4.20 regarding comments on the Nantucket incident.

The wind turbine generators will not have any oil-storing equipment, although the offshore substations will have some oil-storing equipment. As per page 81 of 208 of BOEM's ROD, an Oil Spill Response Plan (OSRP) must be submitted to the Oil Spill Preparedness Division

(OSPD) of a federal agency called the Bureau of Safety and Environmental Enforcement (BSEE) for approval before any installation of oil storage or handling equipment on the Outer Continental Shelf. *See* Response 4.1 for a link to BOEM's ROD.

Comment 4.42
There are studies which the turbines can change the air pressure with the rotation of their blades causing birds to collide with them.

Response 4.42
The commenter did not include or identify any specific recognized studies to support the above statements. This comment is also outside the scope of this permitting action under the Clean Air Act. However, EPA notes that BOEM's Record of Decision requires the project to have plans to minimize adverse effects to birds, including a bird perching deterrent plan. The ROD also requires that, to minimize collisions, every 5 years the project must create a review of best modern technologies to prevent bird collisions and present it to BOEM for approval.

Comment 4.43
There is also some evidence that the turbines may affect ocean creatures such as dolphins and whales.

Response 4.43
The commenter did not include or identify any specific recognized studies to support their statements, and it is not clear how this comment pertains to this permitting action. However, for concerns regarding marine life, *see* Responses 4.1 and 4.10.

Comment 4.44
This project can affect recreational and commercial activities.

Response 4.44
This comment is outside the scope of this permitting action under the Clean Air Act. *See* Response 4.39 for recreational concerns and *see* Response 4.29 for economic concerns.

Comment 4.45
These Industrial Utility Electric Power Plants contain hundreds of thousands of gallons of fossil fuel petrochemicals subject the North Atlantic corrosive saltwater environment suspended above our Ocean less than 9 miles from our beaches and homes. As we have seen with the closure of the beaches in Nantucket, these Industrial Offshore Wind Turbine Power Plants are machines that can and will fail. It is a matter of fact these will leak and spew fossil fuel petrochemicals into the air and water.

Response 4.45
Fuel bunkering to supply ultra-low sulfur diesel (ULSD) fuel (or marine fuel, if necessary) for use by ships will be available during the Construction and Commissioning (C&C) phase, expected to last up to two years. The safety aspects of this process are well documented in the public domain. Portable diesel generator engines to be used temporarily to provide energy during the commissioning of the wind turbine generators (WTGs) and offshore substations (OSSs) in

the project's C&C phase will also use ULSD. During the Operations and Maintenance (O&M) phase, the application and permit outline use of up to 8 OSS permanent generators running on ULSD to be located on the OSSs and used during storms and when electrical connection to the grid is lost. All emissions from these generators were considered as part of this CAA permitting process, and the permit contains conditions related to these engines to require their compliance with the CAA. Each permanent generator will have its own 8,500-gallon ULSD fuel storage tank. The permit contains conditions to limit air emissions from the engines and tanks using or storing ULSD (or marine fuel). During the O&M phase of this project, the WTGs will not contain any fossil-fuel power engines. To the extent the comment relates to water impacts, it is outside the scope of this OCS air permitting action under the Clean Air Act.

See Response 4.2 for more information on the OSS generators.
See Response 4.20 for comments regarding the Nantucket project.
See Response 4.41 for comments regarding possible oil spills.

Comment 4.46
The construction and maintenance of up to 200 wind turbines, along with the associated offshore substations and inter-array cables, pose significant environmental risks. These include harm to marine ecosystems and wildlife, disruption of marine habitats, and increased underwater noise pollution, which can negatively impact marine mammals and fish populations.

Response 4.46
This comment lacks specificity and it is not clear how these comments pertain to this permitting action.

See Responses 4.1, 4.3, and 4.10 regarding marine ecosystems and underwater noise pollution.
See Response 4.4 regarding inter-array cables.

Comment 4.47
There is a risk of hazardous material spills during the construction and operational phases, which could further degrade air and water quality in the region.

Response 4.47
The commenter does not clearly identify which materials cause the expressed concerns. To the extent the commenter is concerned about potential oil spills, *see* Response 4.41. To the extent the commenter is concerned about the potential release of SF_6 gas, *see* Section 1.0 of this Response to Comments.

Comment 4.48
The cumulative impact of these activities could outweigh the environmental benefits of the renewable energy produced. Therefore, a thorough environmental impact assessment and consideration of alternative solutions with lower ecological and air quality impacts are essential before granting any certification.

Response 4.48
See Response 4.4 for a link to BOEM's Final Environmental Impact Statement (FEIS). In the FEIS, a total of 21 alternatives were considered. Of these, 5 action alternatives and the No Action Alternative went through a detailed analysis. After analysis by the Department of the Interior, the Preferred Alternative (or "selected alternative") was determined to allow for OCS renewable energy development while protecting human, marine and coastal environments. The bottom of page 39 of 208 of BOEM's ROD (*see* Response 4.1 for a link) relays the reasons why this alternative was selected:

> *The final EIS found that the selected alternative would result in fewer impacts than other action alternatives considered and is consistent with the purpose and need.*

Comment 4.49
I oppose these wind projects because they pose an extreme threat to marine wildlife and the habitat on which the fish and mammals depend. The threat to birds is also foremost in my mind.

Response 4.49
This comment lacks specificity and it is not clear how the issues raised by this comment relate to this permitting action.
See Responses 4.1, 4.3, and 4.10 for comments on marine wildlife.
See Responses 4.42 and 4.6 for comments on birds.

Comment 4.50
There is no level of exposure to air pollution such as NO_2 and particulate matter that avoids health impacts. The release of air pollutants could also affect marine water quality when pollutants are deposited into the environment. Further, the onshore components of the project are expected to impact some vegetation—a risk that is only addressed in the Fact Sheet and not in the draft permit. The permit must fully address vegetation impacts as required by law. Otherwise, EPA cannot approve it. Allowing avoidable environmental impacts to occur defeats the purpose of Projects 1 and 2, whose stated purpose is to benefit the environment.

Response 4.50
The final modeling submitted meets all of EPA's requirements, and emissions in either of these phases (C&C or O&M) will not cause or contribute to any violations of the NAAQS or PSD Increment. While the Clean Air Act's PSD regulations do not require EPA to assess the impacts of pollutant deposition to the ocean, they do require analysis of emissions impacts to vegetation and soil, and the impacts to vegetation from pollutants such as NO_2, $PM_{2.5}$, PM_{10}, and CO were addressed in the modeling. Table 9 of the Fact Sheet shows that all of the maximum predicted air pollutant concentrations for the project (onshore or offshore) are below the threshold for impacts to vegetation. The permit includes limits on the OCS Facility's daily and annual pollutant emission rates to ensure that the emission rates used in the air modeling analysis are not exceeded.

The purpose of the Atlantic Shores Offshore Wind Project is to develop a source of renewable energy to the Northeastern United States, helping both the U.S. and New Jersey achieve their renewable energy goals and reduce greenhouse gas emissions. The project will also create new

employment opportunities. The highest annual emissions generated by this project will be during the C&C phase (2 years), with lower annual emissions expected and allowed during the 30-year O&M phase that follows the C&C phase. The majority of the project's timeline will consist of these lower annual air emissions. The terms contained in this permit are intended to ensure that the project air emissions are in compliance with the CAA, including measures as appropriate limiting those emissions.

EPA notes that BOEM considered alternatives, including a no action alternative, to prevent adverse environmental impacts. *See* Responses 4.1 and 4.4 for links to BOEM's ROD and FEIS. BOEM's Record of Decision explains that, ultimately, the preferred alternative limited adverse environmental outcomes while still allowing for the generation of renewable energy.

Comment 4.51
The wind farms in question are to be constructed at a distance numbering less than 8 miles from the coastline and will be visible to residents from the shore. Tourism within the communities of the New Jersey Atlantic coastline, particularly what is termed the "Jersey Shore," is a significant contributor to the state's economy, enabling both small and large businesses in the area to thrive, which helps to nurture the healthy economic environment of New Jersey. Placing these wind farms at the proposed distance from the shoreline will create a public eyesore and produce a detrimental effect upon New Jersey's tourism and overall fiscal health. Most current offshore wind farms are recommended to be placed at a distance near 25 miles offshore- outside of public view. Allowing this project to be constructed distanced at less than 8 miles offshore is imprudent.

Response 4.51
The Atlantic Shores project, at its closest, will be 7.6 nautical miles (8.7 statute miles) from shore. There are a lot of considerations that go into determining the locations of offshore wind farm leases. Regarding BOEM's process for establishing offshore wind energy leases, *see* Response 10.1. *See* Responses 4.25 and 10.5 for discussion of visibility impacts. For a response regarding tourism and economy concerns, *see* Response 4.39.

Comment 4.52
The drilling and land disruption could potentially cause problems with the old buildings and high rises that are not structurally sound in Atlantic City.

Response 4.52
This comment is outside the scope of this permitting action under the CAA. The OCS air permit regulates air emissions from pile driving in the lease area. However, it is highly unlikely that seabed vibrations caused by pile driving will travel 7.6 nautical miles or more to cause problems to the buildings in Atlantic City. To the extent this comment is expressing concern regarding any drilling or land disruption occurring onshore as a result of construction of the cable landing sites and/or other necessary onshore infrastructure, such onshore work is not within the scope of this OCS air permit. To the extent federal, state, or local permitting or other requirements apply to onshore work, the applicant would be required to comply with such requirements.

Comment 4.53
Demolition work during the construction phase ("C&C") will certainly have air polluting effects, according to the Project's own documents, and will require additional impact analyses according to the Fact Sheet on pp. 59-61.

Response 4.53
EPA is not aware of demolition work at the site of the OCS Facility to be conducted during the C&C phase. However, air emissions from the OCS Facility during the C&C phase, including from OCS source vessels and marine and non-marine engines, are addressed by the terms of this permit and were evaluated as part of air quality analyses and modeling submitted as part of the application, reviewed, and discussed in the Fact Sheet. Page 59 of the Fact Sheet (available at https://www.epa.gov/system/files/documents/2024-07/atlantic-shores-ocs-fact-sheet-july-11-2024_0.pdf and in the docket number EPA-R02-OAR-2024-0312 for this action at http://www.regulations.gov) states the following:

> *EPA concludes that the emissions in either of these phases will not cause or contribute to any violations of the NAAQS or PSD Increment, and Atlantic Shores has satisfactorily met the ambient air quality impact requirements of the PSD regulations.*

For additional in-depth discussions of the various modeling and air analyses conducted for this project, *see* Section 5.0. To the extent the commenter is referred to any demolition work that may occur onshore for constructing infrastructure to deliver the electrical power generated by the offshore wind farm, such onshore work is outside the scope of this OCS air permitting action.

Comment 4.54
We also have concerns regarding the impact of transmission cables on the subaqueous environment. Moreover, the potential impacts on ambient temperature from increased water temperatures coming from many miles of "hot" transmission wires running from the clusters to the shores should be considered. Has an analysis been done of this impact? It is bad enough that these cables will be trenched through Essential Fish Habitat (as defined in the Magnuson–Stevens Fishery Conservation and Management Act). Has it been determined what impact the swath of cable running many dozens of miles underwater will have on the water temperature along the route? It has been argued that water temperatures are increasing, yet it is proposed that this massive length of cable will run underwater before being trenched through a beach in which endangered and threatened species' breeding grounds are located. Is there an impact on ambient temperature, and water temperature, that will exacerbate the claim that our ocean water temperatures are increasing?

Response 4.54
EPA notes that, for wind farm projects, the US Army Corps of Engineers (USACE) designated BOEM as the lead federal agency for complying with the consultation requirements of Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 U.S.C. § 1801 *et seq.,* regarding Essential Fish Habitat. EPA, in the interest of efficiency and consistent with federal law, also designated BOEM as the lead federal agency to ensure compliance with the MSFCMA. BOEM consulted with the National Marine Fisheries Service (NMFS) on USACE's behalf. BOEM and USACE reached an agreement regarding the analysis of Essential Fish Habitat conservation recommendations provided by NMFS which are listed on

Page 64 of 208 of BOEM's ROD. The conservation recommendations do not include the issue of heat from buried cables raised by the commenter. *See* Response 4.1 for a link to the ROD.

BOEM has published a white paper discussing heat from buried transmission cables, which can be accessed at https://www.boem.gov/sites/default/files/documents/renewable-energy/studies/Transmission_Cable_Heat_WhitePaper.pdf. The white paper discusses that heat transferred through a cable or other object will be transferred through the sea water until the temperature balances out and reaches thermal equilibrium. Because of the ability for water to absorb heat, the amount of heat generated from transmission cables is not enough to create a discernable change in ocean temperature.

See Responses 4.1, 4.3 and 4.10 for additional discussion of marine wildlife impacts.

Comment 4.55
An honest analysis of the impacts on migratory waterfowl, Puffinus species, and other migratory birds that fly at night over the ocean between New Jersey and New York needs to be performed. While not all of this falls under the purview of the EPA, this agency should assure the appropriate agency addresses these concerns vis a vis the impacts of massive turbines. We ask the EPA to do a thorough and honest analysis of the environmental impact of these turbine clusters and, where appropriate, ask the appropriate agency to address the issue.

Response 4.55
The Clean Air Act does directly address the commenter's concerns. However, EPA, in the interest of efficiency and consistent with federal law, designated BOEM as the lead federal agency for this project to ensure compliance with the Endangered Species Act (ESA), 16 U.S.C. § 1531 *et seq.* BOEM has conducted an environmental impact analysis for the project, including impacts on birds, and addresses bird impacts in its ROD. *See* Responses 4.42 and 4.6 for further discussion regarding bird impacts, and Responses 4.1 and 4.4 for links to BOEM's ROD and FEIS. As discussed in section 5.2 of the ROD, an Avian and Bat Post Construction Monitoring Plan (ABPCMP) will be developed by the Lessee with input from the New Jersey Department of Environmental Protection, US Fish and Wildlife Services, and other interested parties. Annually, throughout the O&M phase the Lessee is required to complete and submit an Annual Monitoring Report that includes data, analyses, and summaries of ESA and non-ESA birds and bats. Following the report, the Lessee will meet with BOEM, BSEE, and USFWS within 30 days to discuss the results. If adjustments to the ABPCMP plan are deemed necessary, the Lessee must comply.

Comment 4.57
We believe the EPA has the obligation, and ability, to consider the direct emission impacts of the turbine clusters caused by commercial and recreational fishing vessels, as well as coastal and international ships, being forced to take protracted routes to circumvent clusters. So, for example, commercial and for-hire fishermen have long pointed out that the turbine clusters will force them to take protracted routes to offshore fishing grounds to circumvent the clusters. Likewise, for many (e.g., clam, scallop and finfish fishermen) the clusters' locations will limit access to certain grounds and force those vessels to take more circuitous routes to other grounds, thereby forcing them to burn more fuel while seeking to produce food for consumers and access

recreational opportunities. It fails to adequately address the long-term impacts of turbine cluster locations on the vessel routes, as well as coastal and international ships. In summary, these clusters will force vessels to run further, burn more fossil fuels, add to the cost of food and other products to U.S. consumers, and impact air quality.

Response 4.57
Impacts on travel routes for fisherman are outside the scope of this OCS air permit. However, EPA notes that page 27 of BOEM's Record of Decision states that "It is important to clarify that approval of the Project would not limit the right to navigate or fish within the Project Area." The ROD also discusses impacts to vessel traffic, and while it notes various adverse impacts related to fishing and navigation, it also states at page 26 of the ROD:

> *The project-specific Navigation Safety Risk Assessment (NSRA) shows that it is technically feasible for mariners to navigate through the Project...The NSRA involves several analyses including a detailed assessment of existing vessel traffic in the Project area, a review of the characteristics of the existing waterways, an analysis of meteorological and oceanographic (metocean) conditions affecting navigation, and an evaluation of historical search and rescue activity in the region...All the structures will be placed east-northeast to west-southwest and spaced 1.0 nm [nautical mile]and north to south spaced no less than 0.6 nm apart to align with the predominant flow of vessel traffic. Atlantic Shores consulted with USCG [US Coast Guard] and the fishing industry on the grid layout to minimize the project effects to navigation safety, and SAR [search and rescue] operations for the Project area.*

Comment 4.58
Commenter would like to work with those entities implementing the project to ensure this project is designed to prioritize minimal impact on our residents who have been largely ignored up to this point. State leaders, who commenter understands to have primary purview over the on-land transmission, have not addressed essential issues in a transparent and thorough manner, including:

- Health and safety
- Impact to our infrastructure and environment
- Tertiary costs to taxpayers

Studies regarding electromagnetic fields (EMF) have shown increased risk of cancer, including childhood leukemia. Many experts suggest such high-power cables be at least 200 meters (660 feet) from homes, yet these cables are proposed to be as close as 25-50 feet from Sea Girt, Manasquan, Wall and Howell homes and schools.

Response 4.58
The issues raised by the commenter related to on-land electrical transmissions are outside the scope of this OCS air permitting action under the Clean Air Act. This OCS air permit relates to the offshore Atlantic Shores Project OCS Facility, not the onshore infrastructure. For a discussion on EMF impacts to marine species, *see* Responses 4.4 and 4.13.

Section 5.0 – Dispersion Modeling Analysis

The air quality modeling analyses supporting this permit demonstrate that construction and operation of the proposed source would not cause or contribute to a violation of any NAAQS or PSD increment under any conceivable construction or operating scenario that may occur under the terms and conditions of the permit. Since there will be variability in exactly how, when, and where the permit-specific construction and operation activities will be conducted by the permit applicant, the modeling is based on conservative assumptions that are intended to reflect a level of activity that is as high or higher than what could reasonably be expected to occur over the relevant period of time. Such a "worst case" approach is intended to project a higher-level of air quality impact than any impact that could be expected under the terms and conditions of the permit; this approach is used in order to ensure protection of the NAAQS and PSD increment at all times under anticipated meteorological conditions. Each of the modeling parameters described in the responses that follow in this section reflect a level of activity and emissions that reasonably approximate such worst-case air quality impacts, considering the nature of the project described in the permit application and supplementary information, and the terms and conditions of the permit.

Comment 5.1
The construction schedules are not consistent among EPA's OCS air permit, BOEM, and NMFS. In the OCS permit, there is a construction of 141 turbines to be fully installed in one year. BOEM has a construction schedule of 100 turbine foundations in one year. The OCS air permit application should have been based on the 200 anticipated turbines for projects 1 and 2.

Response 5.1
The application states that construction of the project is expected to take less than two years, which is consistent with what the commenter indicates is BOEM's assumption of 100 of the 200 turbines being constructed each year. However, in order to ensure that even in a worst-case (i.e., highest emissions-per-year) scenario that the project subject to the OCS air permit would not result in annual NAAQS and increment standards being violated, analyses performed for these purposes assumed that, at most, 141 turbines would be constructed in a single year. The annual modeling conducted for these purposes modeled emissions for 3 years (using meteorological data from 2018-2020), and for each of those three years made the same assumption that the same 141 turbines and 4 offshore substations would be constructed (the emissions associated with annual construction for the turbines are represented in AERMOD modeling files as WTG_V1-WTG_V141; offshore substations are represented in AERMOD modeling files as OSS_V1-OSS_V4). Modeling the same construction as if it were occurring in three different years was meant to capture what the project's impacts would be during the worst-case meteorology year.

Comment 5.2
As shown in Table I–1 of the OCS air permit application, wind turbine foundation installation for projects 1 and 2 is only separated by a year. Since the 24-hour air quality standards and increments are based on a 3-year average, the additional 60 turbines should have been modeled. Absent such explanation it appears that they have not.

Response 5.2
Unlike the modeling and air quality analyses conducted for purposes of analyzing compliance with annual NAAQS and increment requirements, the modeling and air quality analyses conducted to determine the project's compliance with short-term NAAQS and increment standards (i.e., 1-hour, 8-hour, and/or 24-hour standards) did not assume that 141 turbines would be constructed in a year. Instead, in order to ensure that modeling for the short-term standards represented a worst-case scenario (i.e., for this purpose, the highest emissions per 1-hour, 8-hour, or 24-hour period), the modeling assumed that all sources of emissions from all activities that would occur during construction were occurring simultaneously and continuously for 3 years (i.e., 24 hours a day, 365 days a year, for 8760 hours per year or 8784 hours per year in a leap year). The modeling used meteorological data for the 3-year period between 2018-2020, in order to ensure compliance with the short-term standards even if the highest impacts occurred in the worst-case meteorological conditions over that period. The emission sources were also modeled as if they were all placed in the northwest corner of the lease area, closest to the coastline of New Jersey and the Brigantine National Wilderness Area, to represent maximum possible onshore impacts.

The commenter's concern that 60 turbines were left out of modeling is not relevant to the short-term NAAQS and increment modeling since, as discussed above, construction activities were modeled as occurring continuously. EPA notes, however, that construction of 141 turbines in one year is a worst-case scenario (Atlantic Shores has represented that 141 turbine installations reflects the highest possible amount of activity that may occur in one year based on the schedule presented in the OCS air permit application). To ensure worst-case scenario modeling, annual NAAQS and increment modeling assumed construction of 141 turbines in a year for multiple years, which adds up to more than the 200 total turbines covered by this permit, and thus accounts for the 59 turbines not included in the first year of construction. *See* Response 5.1 for additional discussion of annual NAAQS and PSD increment modeling.

Comment 5.3
On a monthly basis the uniform installation rate of the air quality modeling scenario is not consistent with the BOEM and NMFS schedules. It would place 56 turbines foundations into the seabed from June through September, but the BOEM and NMFS schedules call for 75 installations during that period. This can underestimate impact at the Brigantine National Wilderness Area because summer conditions are likely to be more conducive to higher received concentrations there.

Response 5.3
Modeling to ensure the project would meet short-term NAAQS and increment standards used conservative assumptions, *see* Response 5.2. Construction activities were modeled as if they occurred continuously, 24 hours per day, throughout the entire year to ensure that worst-case emissions and meteorological conditions were captured. If construction were conducted at that pace, it would result in construction at a pace of about 20 foundations installed per month (*please see Response 5.4* for a more detailed discussion of foundation installation schedule), and approximately 80 foundations could be installed during the four-month period of June through September. This ensures that the impacts at Brigantine National Wilderness Area were not underestimated. However, nothing in the permit requires that construction be conducted at this speed, and the nature of worst-case assumptions are such that it is not expected that construction

will in fact occur at this pace.

Comment 5.4
Commenter questions foundation installation schedules used for other environmental reviews.

The estimate of 2.6 days per foundation installation provided by the permitting contractor, Epsilon Associates, in support of the air permit in its letter to the EPA of October 28, 2022 raises serious questions about the foundation installation schedules that have been assumed for the BA [Biological Assessment], BO [Biological Opinion] and the environmental impact statement (EIS).

Those schedules assumed 201 turbines installed over 2 years. They are based on specific monthly numbers in the Jasco Applied Science Underwater Acoustic Impact Assessment Report of 10 August 2022 in Appendix B, Table 3. That schedule assumed, over a two-year period, that 35 foundations could be installed in June, 45 in July, 37 in August, 32 in September and 29 in October for a total of 178 installations. But based on the Epsilon 2.6 days per foundation number only 11 can be installed in one month, or 110 turbines foundations in 2 years over that five-month period.

This leaves a deficit of 68 turbines foundations not accounted for in the Jasco schedule. About 20 of those might be accommodated in December (2 years) where little installation is currently shown, but this still leaves a deficit of 48 turbines foundations. At a rate of 11 foundation installations per month, the construction schedule for the BO, BA and final EIS would have to extend at least four months into spring and summer of the third year, which raises issues regarding the Take estimates in those documents and the basis for the BO.

Response 5.4

On March 29, 2023, Atlantic Shores submitted to EPA a memo entitled "3.4.1 Atlantic Shores Modeling Memo 3 7 2023 EPA" with information regarding the days of construction for heavy emitting activities; this updated the October 28, 2022 submittal and the memo is included in the

docket for this permitting action. On page 6 of the memo is the following table:

Table 1
Days of Actual Construction versus Proposed Modeled Days of Construction

Heavy Emitting Activity	Days of Actual Construction at a Single Position	Proposed Modeled Days at a Single Position
Foundation Installation (B02)	1.5 days	365 days (possibly avoiding Time-of-Year restrictions)
WTG Installation	2.6 days	365 days
Pre-lay Cable Preparation	< 1 day	365 days
Inter-array Cable Installation	1.1 days	365 days
OSS Installation	5 Days	365 days (possibly avoiding Time-of-Year restrictions)
Scour Protection	0.5 Days	365 days

As the table indicates, a foundation installation is expected to take 1.5 days, and a WTG installation is expected to take 2.6 days. If the foundation installation takes 1.5 days, then an average of 20 foundations can be installed in a month. Atlantic Shores' application represents that the foundation installation rate of 1.5 days is a conservative estimate representing a slow rate of installation, and the actual rate could vary based on several factors, including weather conditions. For example, weather conditions in July are typically more favorable for vessel activities and are likely to enable a quicker rate of installation.

At a rate of 20 foundations per month, it would require 10 months to install 200 foundations. This duration of 10 months for WTG foundation installations is listed in Table 1-1 on page 19 of 460 of the permit application.

EPA notes that, although it was not directly raised by the commenter, the table above indicates that, *after* a WTG foundation is installed, a conservative estimate representing a slow rate of installation would be that a WTG installation (installing the topside of the WTG on top of the foundation) would take 2.6 days per installation. At such a rate of installation it would take 17 months to install 200 WTGs. EPA is not aware that limitations on the timing of such installations apply as they do to the installation of the WTG foundations. It should also be noted that WTG foundation installations and WTG topside installations can happen simultaneously for different WTGs. This is because one vessel can install a foundation at one location while a different vessel installs a WTG in another location where the foundation has already been constructed. And as previously stated, the modeling reflects these two construction activities occuring simultaneously.

Comment 5.5

The Air Permit Application has Unrealistic and Realistic Foundation Installation Rates.

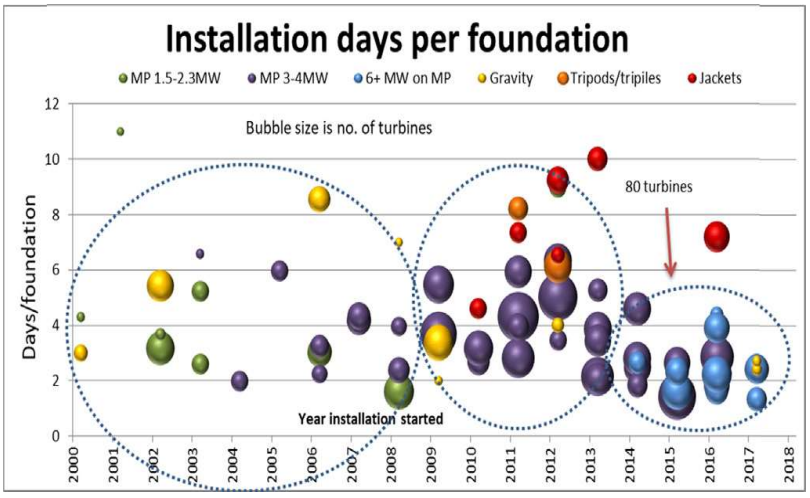
The application does not present a clear statement of and justification for a daily and yearly foundation and wind turbine generator (WTG) installation rate. This is important because it determines the number of years required for construction which directly affects the averaging done for the 24-hour PM2.5 increment over the 3-year period.

Table I–1 of the application states a project foundation installation of 10 months or 300-day duration and a three-year construction period. Assuming that 300 days applies to the 141 segmented turbine project that is a rate of 2.1 days per foundation. The air permit modeling speaks to a "peak" year of 141 turbines installed, without regard to seasonal restrictions or a rate of 2.6 days per turbine.

These rates are clarified in a letter from Epsilon Associates to EPA Region II of October 28, 2022 stating that "**foundation installation** would take 62.05 hours (or **2.6 days**) and wind turbine generator **(WTG) installation another** 35.5 hours (or **1.5 days**) to complete installation at each position". According to that letter these two activities result in the higher PM2.5 emissions.

The Epsilon Associates estimate of 2.6 days for foundation installation is supported by real world experience with installation times as shown below.

Figure 1



Overall picture of the time taken to install one foundation (without the turbine) for each OWF that has finished foundations installation.

Source: Offshore wind installation: Analysing the evidence behind improvements in installation time, Roberto Lacal-Arántegui, José M. Yustab, José Antonio Domínguez-Navarrob a Joint Research Centre, European Commission, Petten, The Netherlands Department of Electrical Engineering, Universidad de Zaragoza, Spain.

As shown, the installation time for smaller 6-megawatt (MW) turbines on monopile foundations has leveled out at one every two days. It can only take longer for the larger diameter foundations here for the 15 MW turbine foundations here.

For those foundations, the two days per foundation is low because the steel surface area being driven into the seabed increases significantly for the larger turbines foundations here as opposed to the 6 MW turbines shown above.

The foundation being driven is a hollow cylinder of given diameter and shell thickness. The shell is making contact with the seabed. For the 6 MW turbines the foundation diameters are typically 7.5 to 8 meters (26 feet) with a shell thickness of 3.26 inches. The 15 MW turbine foundations here are 15 meters (50 feet) with a shell thickness of approximately 6 inches.

The circumference area being driven into the seabed for the 15 MW foundations is approximately 12.3 ft.^{2} as opposed to 3.6 ft.^{2} for the 6 MW turbine, or 3.5 times as much. This is the area offering resistance to the pile driver. It is therefore reasonable to assume that it will take about three times as long to pile drive one of the 15 meter diameter foundations, as opposed to the 7.5 to 8 meter diameter foundations in the chart above.

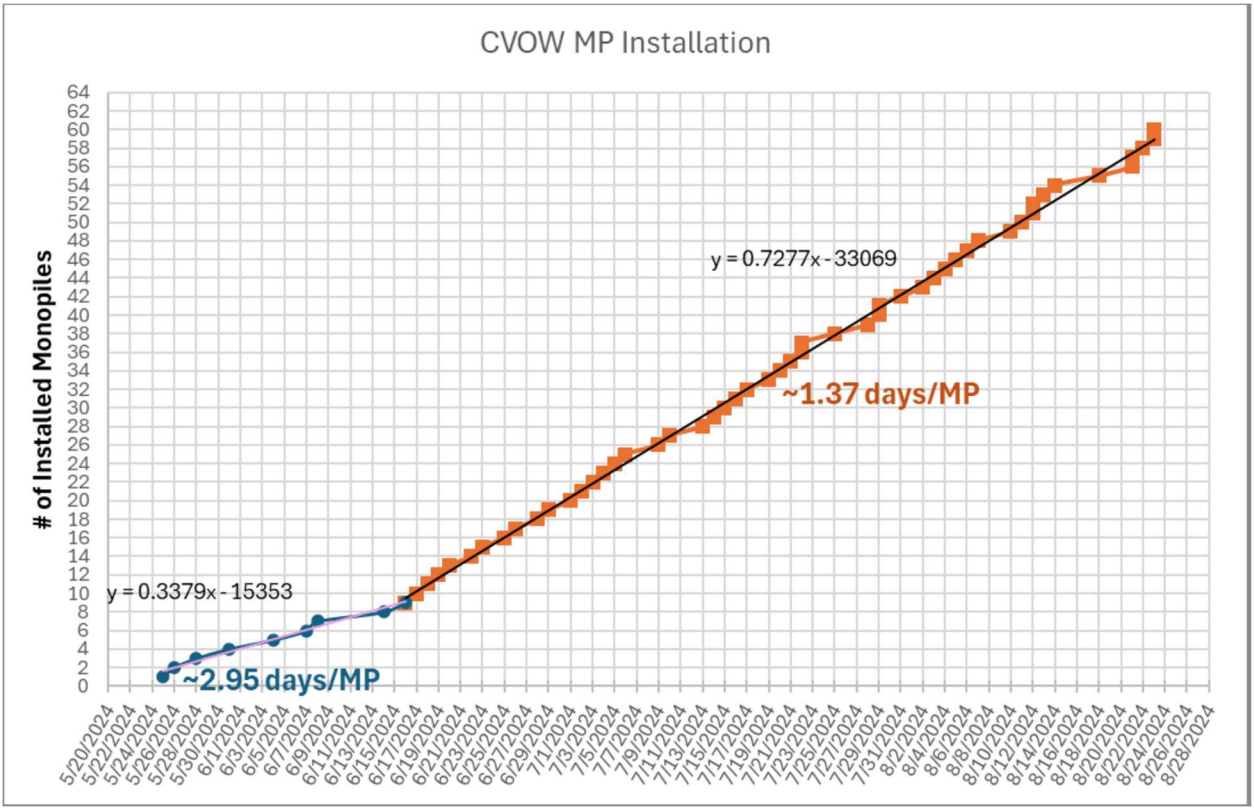
This is confirmed by BOEM and Jasco Applied Science data. In its supplemental information for the Vineyard Wind 1 project Biological Assessment of May 11, 2020, the BOEM stated in table 4.1-1 that the time to pile drive a 7.5 meter diameter foundation was about three hours. In its August 10 report, Appendix B, Table 1, Jasco estimates the time required to pile drive a 15-meter monopile foundation at 8.6 hours, or about three times as long.

Considering the increased pile driving time, and longer times for other foundation construction activities for the larger monopiles, the calculation of the 24-hour increment at the [Brigantine Wildlife Area] requires averaging the yearly 98th percentile numbers well into the 3-year period. This permit application has apparently and improperly considered only one year of higher construction emissions and concentrations, and averaged that with two years of lower emissions.

Response 5.5
On March 29, 2023, Atlantic Shores submitted updated information regarding the estimated days of construction for the foundation installation and WTG installation. Based on this submittal, foundation installation is expected to take 1.5 days per foundation, and WTG installation is expected to take 2.6 days per WTG. This distinction is important, as pile driving is associated with the foundation installation. *See* Response 5.4 for a more detailed discussion of foundation installation schedule.

In response to this comment, EPA sought supplemental information from Atlantic Shores, and Atlantic Shores reiterated that 1.5 days per foundation is the best estimate and the 2.6 days per foundation is not reflective of their best estimate. Atlantic Shores provided a real-world example with a similar value for a similar project, although it noted that foundation installation times can be variable. The Coastal Virginia Offshore Wind Project (CVOW), which is currently under construction off the coast of Virginia with similar monopile and transition piece foundations, has made announcements indicating that they started foundation installation on May 22, 2024, and had installed their 50th turbine on August 12, 2024, which is a pace of about 1.65 foundations per

day. Atlantic Shores noted this includes installation of the first foundations, which it would expect to occur at a slower rate due to required extensive sound field verification and normal installation ramp-up. Following the initial startup period, the installation pace at CVOW has been about 1.4 days per location. This information has been made public via the United States Coast Guard District 5 Local Notice to Mariners (LNMs). Atlantic Shores provided the figure below documenting the dates of foundation installation.



The commenter raises concern about the averaging done for the 24-hour $PM_{2.5}$ increment. As discussed in Response 5.2, for short-term standards such as the 24-hour increment, construction emissions from all sources and for all activities were modeled continuously using three years of meteorological data and worst-case assumptions about source locations. For the 24-hour Class I $PM_{2.5}$ increment, compliance with which is assessed at the Brigantine National Wilderness Area, the standard is not averaged over a 3-year period, but rather the modeled concentrations of $PM_{2.5}$ at each receptor for each year are reviewed to ensure that the 24-hour $PM_{2.5}$ increment for a Class I area is not exceeded at a given receptor more than once per year (the "2nd-high"). This "2nd-high" value is examined for all three years modeled to ensure that the highest "2nd-high" value over the 3-year period (also referred to as the "high-2nd-high") does not exceed increment requirements. The number of years across which construction is conducted does not impact this analysis because of the conservative assumptions described above that assume all sources operate at all times, every day. In supplemental information provided by Atlantic Shores, Atlantic Shores indicated that while a shortened timeframe for foundation installation could impact the actual hourly emision rate in either direction depending on the circumstance, in general a shorter installation period will almost always correlate to lower total emissions, and Atlantic Shores used load factors from established references and based on project team experience.

The yearly averaging referred to by the commenter is instead conducted in the analysis to ensure compliance with the 24-hour $PM_{2.5}$ NAAQS, not the 24-hour $PM_{2.5}$ increment. This analysis identifies, for each modeled receptor, the day during each modeled year with concentrations of $PM_{2.5}$ in the 98th percentile; in practice, this turns out to be the day with the 8th-highest concentration in a given year for a given receptor. This 98th percentile value for each of the three years are then averaged together, and this average cannot exceed the 24-hour $PM_{2.5}$ NAAQS. And again, the number of years across which construction is conducted does not impact this analysis because of the conservative assumptions described above that assume all sources operate at all times, every day.

For additional discussion related to the 1-hour NO_2 NAAQS standard, *see* Response 5.7.

Comment 5.6 (10,
The Air Permit Application is Ignoring Real World Monthly Constraints on Pile Driving

The air permit application has ignored the real-world constraints on pile driving imposed by its sister agencies.

It has assumed a uniform foundation installation rate throughout the year. But the NMFS Biological Opinion only allows pile driving from May through November.

The air permit application states that it modeled air quality concentration at the [Brigantine Wildlife Area] throughout the year to be conservative, but this is not likely to be the case since more stable atmospheric conditions conducive to higher modeled concentrations at the shore, are more likely in the summer rather than the winter. Therefore, the air permit application should have modeled construction activities only for those mostly spring and summer months.

The air permit application has not stated the number of hours per day required to pile drive one foundation. That duration can be an important factor in calculating the 24- hour concentrations at the BWA. Depending on that number, there may also be a need to maintain pile driving at night to adhere to annual construction schedules, as discussed further below.

Response 5.6
The application acknowledges the time of year restrictions on pile driving. In Table 1-1, on page 19 of 460 of the permit application, note "C" states:

> *The expected timeframe depends on the foundation type. If piled foundations are utilized, pile-driving will follow a proposed schedule from May to December to minimize risk to North Atlantic Right Whale. No simultaneous pile driving is proposed.*

As previously mentioned, construction activities were modeled throughout the entire year as if all emitting activities were conducted every day, to ensure that the effects of the worst-case emissions during worst-case meteorological conditions were captured; given these assumptions, modeling winter months would not impact the emissions modeled for summer months. In addition, for the short-term NAAQS and increment standards, construction activities such as pile driving were modeled as work conducted during each hour, all 24 hours of the day, to ensure that all possible air impacts were captured regardless of when during the diurnal cycle work is conducted. This includes at night, where stable conditions could potentially lead to higher concentrations. *See* Response 5.2 for additional discussion of modeling assumptions made for short-term NAAQS and increment analyses.

Comment 5.7

Improper Averaging of Modeled Concentrations & Likely PSD Increment Exceedance

The 24-hour standards and allowed increments at the [Brigantine Wildlife Area] for fine particulates (PM 2.5) is based on the 98th percentile number for a year averaged over three years.

The permit application under review, EPA permit Number: OCS-EPA-R2 NJ 02, has apparently been recently revised to address only one year of air quality modeling of the construction of a "project 1" of 141 turbines, a segmented part of the full 200 turbine Atlantic Shores South Project. But the application still shows in Table I-1 a three-year time frame, from 2026 to 2028, for wind turbine foundation and wind turbine generator (WTG) installation. We assume from those apparent contradictions that no air quality modeling of either construction activity or operations and maintenance activity that would logically follow the construction period was done for 2027 or 2028.

Since the allowed 24-hour concentration increments at the BWA are based on a 3-year average of the 98th percentile number for each year, this improperly segments the project to artificially show a low 3-year average concentration at the Wilderness Area based on just one year of construction activity. On the basis of this improper segmentation alone, this permit should be rejected.

The 3-year average for the fine particulate (PM 2.5) 24 hour-increment at the Wilderness Area is shown in Table 5-10 as 0.69 ug/m3. Since that is the result of averaging the first year concentration with two years of essentially no emissions, the actual first year concentration must have been three times that or 2.1 μg /m3.

We showed above in the Executive Summary and Section 2 above that with realistic assumptions just foundation installation of the full 200 project will extend into the third year. With WTG installation construction activity and associated emissions will encompass the entire three years of the averaging period.

Assuming then that the 24-hour yearly foundation installation concentrations are comparable, the 2.1 μg/m3 concentration at the BWA will occur each year and become the proper 3-year average. The emissions from the project's construction will therefore exceed the allowed increment of 2 ug/m3 for the Brigantine Class I area. Therefore, even with the current underestimated yearly modeling as described below, the permit must be denied.

Response 5.7

It should be noted that the construction activities are expected to be completed in two years. While Table 1-1 of the permit application indicates that foundation installation will start in "Q1-2026" for Project 1, EPA sought supplemental information from Atlantic Shores in response to this comment, and the applicant confirmed the time of year restrictions on pile driving and that pile driving would not be expected to start before May of the given year. Atlantic Shores also stated that the schedule in the application was originally developed to cover both pile-driven and other types of foundations, such as gravity base or suction bucket foundations, which are no longer anticipated to be used. Thus, although the application indicates construction would last from 2026 to 2028, construction would commence no earlier than May of 2026, and is expected to conclude by two years later, during the second quarter of 2028. *See* Response 5.6.

For short-term standards, such as the 24-hour $PM_{2.5}$ increment discussed by this commenter, construction emissions from all sources and for all activities were modeled continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year) using meteorological data for the 3-year period between 2018-2020. *See* Response 5.2 for additional discussion of modeling assumptions made for short-term NAAQS and increment analyses.

Of the short-term standards, only the 1-hour NO_2 NAAQS standard used a slightly different methodology. Instead of modeling impacts as if construction emissions occurred continuously for the entire three-year modeled timeframe, the modeling for the 1-hour NO_2 NAAQS standard modeled the worst-case emissions for two years of construction (the expected length of construction indicated in the application), and one year of emissions for the O&M phase. For each modeled receptor, the day during each modeled year with concentrations of NO_2 in the 98^{th} percentile is identified, and the 98^{th} percentile value for each of these three years (2 years of construction and 1 year of O&M) are then averaged together, and this average cannot exceed the 1-hour NO_2 NAAQS.

The commenter is incorrect regarding the methodology used to calculate compliance with the 24-hour Class I $PM_{2.5}$ increment. Compliance with the 24-hour Class I $PM_{2.5}$ increment is assessed at the Brigantine National Wilderness Area and is assessed on a yearly basis, not averaged over a 3-year period. As explained further in Response 5.5, the modeled concentrations of $PM_{2.5}$ at each receptor for each year are reviewed to ensure that the 24-hour $PM_{2.5}$ increment for a Class I area is not exceeded at a given receptor more than once per year (the "2^{nd}-high"). This "2^{nd}-high" value is examined for all three years modeled to ensure that the highest "2^{nd}-high" value over the 3-year period (also referred to as the "high-2^{nd}-high") does not exceed increment requirements.

Below are the 2^{nd}-high values for each year that was used to determine the 24-hour Class I $PM_{2.5}$ increment for construction. These values can be found in the AERMOD files in the docket:

2018: 0.66406 µg/m3 on 10/09/2018
2019: 0.42058 µg/m3 on 04/06/2019
2020: 0.45476 µg/m3 on 06/19/2020

As show above in bold, the highest 24-hour impact for $PM_{2.5}$ over the three-year period was 0.66406 µg/m3 in 2018. A value representing secondary impacts (0.024 µg/m3) was then added to this value,[3] for a sum of 0.69 µg/m3; this is the value in Table 5-10 of the Air Quality Dispersion Modeling Report on page 272 of the permit application that EPA then used to determine compliance with the 24-hour Class I $PM_{2.5}$ increment. There was no averaging between the three years, and no averaging with values of 0.00 µg/m3.

For the 24-hour $PM_{2.5}$ NAAQS, where impacts are averaged over a 3-year period, there was no averaging of construction emissions across years of lower emissions, and no averaging with values of 0.00 µg/m3. *See* Response 5.5 for further discussion of calculating compliance with short-term NAAQS.

[3] Secondary impacts account for the formation of $PM_{2.5}$ in the atmosphere as a result of chemical reactions of precursor emissions, in this case SO_2 and NO_X.

Comment 5.8

Underestimated Daily Construction Emissions

The air permit application does not state the hours necessary to pile drive one foundation, but in its email of March 29, 2023 Atlantic Shores stated that it expects a single wind turbine generator (WTG) foundation pile driving installation activity to require only a limited number of hours, likely 3 to 6 hours of piling followed by several hours of less intensive transition piece installation and finishing works. It stated that the entire activity is estimated to require fewer than 12 hours of activity per day in a single location before moving to another WTG location.

The 3 to 6 hours for pile driving is unrealistically low and not consistent with the assumptions for the BOEM Biological Assessment and the NMFS Biological Opinion. Those pile driving times are based on the August 10th Jasco Applied Sciences Noise Exposure Modeling report, Appendix B, Table 1, which assumes that 15,387 strikes are needed to pile drive a 15-meter diameter foundation, which at 2 seconds per strike requires 8.6 hours to pile drive one foundation-assuming no down time.

Three hour pile driving times have only been associated with smaller 7.5 meter diameter foundations according to the BOEM in its supplemental information for the Vineyard Wind 1 project Biological Assessment of May 11th 2020. The 3 to 6 hours is also inconsistent with statements made in the air permit application itself on page 1-11 that is anticipated that it will take a maximum of 7 to 9 hours to drive one monopile.

If a time frame for pile driving of 3 to 6 hours has been used in the air quality modeling then that could grossly underestimate the daily concentrations received at the Wilderness area. The pile driving time needs to be disclosed, corrected upward as necessary, and the modeling redone.

The air permit application should have disclosed what size monopile is being installed and how long it will take to embed it in the seabed. It is important to pin down the pile driving hours required because emissions are high during that activity and air pollutant densities at the Wilderness area could increase for longer pile driving periods, depending on atmospheric conditions, including the degree of fumigation at the shore.

In comments on the air quality model of July 20, 2022, EPA staff raised concerns about the fumigation conditions at the BWA and elsewhere that affects the modeled concentration result. An analysis of the fumigation problem was also requested by EPA staff in a memorandum dated July 7, 2022 to the Modeling Clearing House within the Office of Air Quality Planning and Standards.

It was stated that this would be addressed in the application, and there is some discussion of the fumigation problem in appendix D referring to results shown in Table 2 and modeling files supporting the analysis being sent to EPA Region II. But there is no conclusion stated as to whether that has satisfied EPA concerns.

In its comments to Epsilon Associates of September 30, 2022 the EPA asked that clarification be provided as to whether emission rates used for the short-term NAAQS and PSD increment

modeling represented maximum hourly emissions, this has not been clarified in the air permit application or the EPA fact sheet, but it must be.

For these hours of construction pile driving activity, the application should have described how maximum hourly emission rates are derived. Again, this is crucial to determining an accurate 98th percentile number for the year. The application should have explained which sources and engines are involved in the pile driving operation, which operate concurrently to create the maximum hourly emissions, and whether there are any overlapping vessel activities and emissions.

In internal EPA comments, a statistical analysis was requested to show these concurrently operating emission sources, but this does not appear in the permit application or the fact sheet.

Response 5.8

For the construction modeling done to show compliance with short-term (1-hour, 8-hour, and 24-hour) NAAQS and increment, sources associated with the pile driving, including both the pile driving itself and other work associated with the installation of WTG and OSS foundations, were modeled continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year) using meteorological data for the 3-year period between 2018-2020. *See* Responses 5.5, 5.6, and 5.7 for additional discussion. This was meant to protect NAAQS and increment regardless of what time of day pile driving occurs, how long it occurs, and whether the atmospheric conditions are conducive to higher impacts at the Brigantine National Wilderness Area. In determining compliance with short-term NAAQS and increment, there was no averaging of emission rates across non-operating hours.

For the construction modeling done to show compliance with annual NAAQS and increment, while the emissions were modeled continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year), the emission rate used was annualized. This means the emission rate that was modeled as occurring continuously was determined by multiplying the maximum expected emission rate by the maximum potential hours of operation of the vessel, engine, or construction activity, and then dividing by the total number of hours in the year. Spreadsheets with the "Total Hours", "Peak Year Hours (hr/yr)", and peak hour annual emission rates are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report included on pages 297-304 of the permit application.

For example, for the hydraulic hammer engine and 20 air compressors that would be used during pile driving for the foundation installation, Atlantic Shores identified peak year hours of operation for each of these pieces of equipment of 1,646 hours/yr. Assuming that there will be 141 turbines constructed in the peak year, this means the modeling accounts for 11.67 hours of pile driving for each foundation (1,646 ÷ 141 = 11.67), not 3-6 hours. Again, this assumption was only made for modeling the annual standards, not for the short-term standards (1-hour, 8-hour, and/or 24-hour).

Pile driving is present in the modeling for two construction activities: foundation installation and OSS installation. The sources and engines used in the modeling for these activities include: the heavy lift vessel (main engines 1 & 2, auxiliary engine), the bubble curtain support engine, the barge auxiliary engine, the tug engine, the crew transfer vessel engine, 20 air compressors, and the hydraulic hammer engine. *See* Response 5.12 for a list of sources modeled for foundation

installation and OSS installation. These vessels and engines were included in the modeling analysis because they are the worst-case equipment Atlantic Shores expects to use for their foundation installation and OSS installation activities.

A complete list of modeled sources, including AERMOD source IDs, stack parameters, and emission rates, used in the modeling for the foundation installation are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, on page 305 of 460 of the permit application. A complete list of modeled sources, including AERMOD source IDs, stack parameters, and emission rates, in the modeling for the OSS installation are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, on page 306 of 460 of the permit application.

Regarding shoreline fumigation, and the potential impacts of construction activities at Brigantine National Wilderness Area, this was addressed in the permit application, in Appendix D ("Analysis Of Shoreline Fumigation Submitted Oct 2022") of the Air Quality Dispersion Modeling Report on pages 371-374 and demonstrated to not be a concern. Shoreline fumigation can occur on sunny days when there is a source located right along the coastline. Land warms faster than the ocean, which will result in a mixed layer in the atmosphere inland. A mixed layer is characterized by turbulence, which tends to uniformly mix the atmosphere in the vertical direction. By contrast, the airmass over water is generally cooler and more stable. When shoreline fumigation occurs, this means that during a sea breeze, the plume emitted from a source along the coastline enters the turbulent mixed layer that is located inland, and mix the pollutants towards the ground. However, the Atlantic Shores project at its closest point is located approximately 7.6 nautical miles (8.7 statute miles) from the Brigantine National Wilderness Area, and given this distance from shore, among other factors, thus the "Analysis Of Shoreline Fumigation" in Appendix D demonstrated that shoreline fumigation was not a concern for this project. Given the distance of the lease area to the Brigantine National Wilderness Area, this result was expected.

Regarding short-term emissions, and whether the modeled emission rates represented maximum hourly emissions, this was addressed in the Atlantic Shores responses on September 11, 2023 (document named "3.4.2 Atlantic Shores Responses 9-11-2023" in the docket). On page 7 of 28, EPA asked that Atlantic Shores "confirm that the modeled emission rates are the maximum hourly emission rates since these will become permit limits." Atlantic Shores provided the following response:

> *The modeled emission rates are as-described in the application, notably Section 2.1 and Section 2.1.1. The modeled emission rates are the projected emissions based on the maximum rated capacity of the equipment and maximum throughput of the facility, calculated based on detailed plans for each activity, load factors, and emission factors.*

Short-term emission rates, in grams/second, that were used in the modeling were derived using the formula below:

> Short-term Rate (grams/second) = Number of Engines * Engine Rating (kW) * load factor * emission factor (grams/kW-hour) * (1 hour/3600 seconds)

Comment 5.9
Improper Averaging of Daily Emissions.

The air quality modeling should have been performed for more realistic hours per day to drive one foundation. Air pollutant densities at the wilderness area could accumulate and increase under stable atmospheric conditions for longer pile driving emission periods.

The modeling should be based on maximum daily emissions only during periods of construction, not averaged with periods of no activity. If the Atlantic Shores modeling has averaged 4-6 hours of pile driving emissions with 18 to 20 hours of no or little emission activity then it has significantly underestimated maximum hourly emission rates and the received air concentrations at the Wilderness area. This needs to be clarified in a revised All these in the water. application.

Response 5.9
The relevant modeling has not assumed 4-6 hours of pile driving per day. For an in-depth discussion on hours per day of pile driving in the modeling and impacts at the Brigantine National Wilderness Area, *see* Response 5.8.

Comment 5.10
Failure to Consider Nighttime pile driving

The extended foundation installation times presented in the Executive Summary and Section 2 point to the potential need to continue pile driving at night to maintain the annual schedules in the Biological Opinion and the proposed MMPA rule making. The air permit application assumes no pile driving at night but the NMFS Biological Opinion allows that. Atmospheric conditions at night are potentially more conducive to higher received air pollutant concentrations onshore particularly in the summer months when the pile driving is concentrated as discussed above. Anticipated nighttime pile driving therefore needs to be addressed as it may determine the higher 98th percentile concentrations at the shore for a given year.

Response 5.10
See Response 5.6. For assumptions made for pile driving in the modeling done to show compliance with annual NAAQS and increment, *see* Response 5.8.

Comment 5.11
Monthly Installation schedules

The permit application is apparently based on a uniform monthly number of foundations driven over a 10-month period, which based on the 141 turbines would be 14 per month. The BOEM EIS and Biological Assessment and the NMFS Biological Opinion are based on monthly schedules of 18 foundations in June, 23 in July,19 in August and 16 in September. These are higher than the 14 per month assumed in the permit application and it is expected that these summer months would have more air temperature inversions and lower wind speeds conducive to higher pollutant concentrations at the shore. Therefore, the uniform monthly foundation rate assumption is not as stated in the application a conservative one.

Response 5.11
As discussed in Response 5.4, if a foundation installation takes 1.5 days, then an average of 20

foundations can be installed in a month. And as previously stated, modeling for short-term NAAQS and increment (i.e., 1-hour, 8-hour, and/or 24-hour standards) did not assume that 141 turbines would be constructed in a year. Rather, construction emissions from all sources and for all activities were modeled continuously (24 hours per day and 365 days per year) using meteorological data over a 3-year period between 2018-2020. This was meant to model impacts for all meteorological conditions, including temperatures inversions and lower wind speeds, to ensure meteorological conditions most conducive to the highest concentrations were captured. *See* Response 5.4 for further explanation.

The assumption that 141 turbines will be constructed in the worst-case year was only made in modeling to show compliance with annual NAAQS and increment. When modeling for annual standards, since impacts are based on the yearly average, day-to-day and month-to-month variations are smoothed out over the course of the year.

Comment 5.12

Unclear Emission sources. Construction Emissions.

The statement in Section 4.2.1 of the application regarding source configuration for short term air dispersion modeling during construction that the modeling is "centered" on the offshore substation (OSS) install activity, around this activity are six other activities that could potentially occur in the vicinity of the OSS install activity is concerning and needs clarification. Does this mean that only foundation installation and WTG installations close to an OSS installation have been included in the yearly modeling? Does it mean that 141 installations have been modeled, but only at the OSS installation location and not at their real locations?

The application should have modeled the installation of all the 141 foundations and WTGs at their real locations in the so-called peak year of modeling (see Section 10).

The source configuration discussion in Section 4.2.1 for short term air dispersion modeling during construction provides only a general discussion of activities during construction, it does not list or reference the specific emission sources that are included in the modeling. It says nothing about vessel support emissions which raises concern that the source configuration is not inclusive.

The permit application should be *specific* as to what the short-term construction activity is and what vessels are being included in the short-term calculations for each year *for pile driving, other foundation installation activities, WTG and offshore substation construction.*

For example, for foundation installation, it should specify whether or not emissions from bulk carriers, medium heavy lift vessels, jack up vessels, towing tugboats, transport barges, and service operation vessels are being included in the calculations. For offshore substation installation, it should specify whether large heavy lift vessels, medium heavy lift vessels, bubble curtain support vessels, towing tugboats, assistance tugboats and transport barges are included in the emission sources and air dispersion modeling calculations. It should also disclose whether any operations and maintenance, or vessel survey emissions occur concurrently with construction.

This is especially needed because on page 117 of the application Atlantic Shores raises a number of issues with respect to what should or should not be included, and it is unclear what the modeling has or has not included.

The EPA has provided some emission source information in its fact sheet but it is not approving its own fact sheet, it is approving a company's application. This information must be provided in the application so it is clear that the emissions that EPA is requiring for the air quality modeling are being included in that, as opposed to what Atlantic Shores is asking for. The general statement by Atlantic Shores that it has done the air quality modeling based on *its* interpretation of the EPA rules is unsatisfactory. This must be clarified and the modeling done based on EPA's interpretations of the rules, not Atlantic Shore's.

Response 5.12

Figure 4-4 of the Air Quality Dispersion Modeling Report, on page 242 of 460 of the permit application displays the sources that were included in the *annual* modeling of construction emissions. The following sources were included: 141 wind turbine locations, 4 OSS positions, and 3 line volume sources representing transit emission from vessels. The wind turbine locations and OSS positions were in the expected locations of this equipment, not clustered in a single location, and the 3 line volume sources modeled emissions occurring along vessel travel routes. For each of the expected 141 turbine positions, the emissions from the following activities were included: foundation installation, foundation scour protection, inter array cable installation, inter array cable pre-lay, inter array cable scour protection, WTG installation, WTG commissioning, and fuel bunkering. For the 4 OSS positions, the following activities were included: OSS installation and the OSS commissioning. The transit emissions are for vessels traveling to and from the following ports: Atlantic City, New Jersey Wind Port, and Europe. Spreadsheets detailing all the sources used in the modeling for annual standards, including AERMOD source IDs, stack parameters, and emission rates are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, from pages 296-304 of 460 of the permit application.

For the short-term construction modeling, spreadsheets detailing the sources used and modeled emission rates are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, from pages 305-311 of 460 of the permit application. The spreadsheets list what sources were modeled for each of the activities, including: foundation installation, OSS installation, foundation scour protection, inter array cable installation, inter array cable pre-lay, inter array cable scour protection, and WTG installation. The spreadsheets also include auxiliary engines and support vessels, such as the Bubble Curtain Support vessel. Below are 8 tables summarizing the vessels/engines for each activity in the short-term construction modeling:

Foundation Installation	
Vessel	**Engine**
Heavy Lift Vessel	Main Engines 1
Heavy Lift Vessel	Main Engines 2
Heavy Lift Vessel	Auxiliary Engine
Bubble Curtain Support	Engines
Barge	Auxiliary Engine
Tug	Engines
Crew Transfer Vessel	Engines

Air Compressors (1-20)	20 Air Compressors
Hydraulic Hammer Engine	Hammer Engine

OSS Installation	
Vessel	**Engine**
Heavy Lift Vessel	Main Engines 1
Heavy Lift Vessel	Main Engines 2
Heavy Lift Vessel	Auxiliary Engine
Bubble Curtain Support	Engines
Barge	Auxiliary Engine
Tug	Engines
Crew Transfer Vessel	Engines
Air Compressors (1-20)	20 Air Compressors
Hydraulic Hammer Engine	Hammer Engine

Scour Protection	
Vessel	**Engine**
Fall Pipe Vessel	Engines
US Dredger	Main Engine 1
US Dredger	Main Engine 2
US Dredger	Auxiliary Engine

Inter-array Cable Installation	
Vessel	**Engine**
Cable Installation Support	Engines
Cable Installation Vessel	Main Engines
Cable Installation Vessel	Auxiliary Engines

Pre-Lay Activities for the Inter-Array Cable	
Vessel	**Engine**
Sand Wave Clearance	Main Engine
Sand Wave Clearance	Auxiliary Engine
Pre-Lay Grapnel Run AHTS 1	Main Engine
Pre-Lay Grapnel Run AHTS 1	Auxiliary Engine
Pre-Lay Grapnel Run AHTS 2	Main Engine
Pre-Lay Grapnel Run AHTS 2	Auxiliary Engine

Inter-array Cable Scour Protection	
Vessel	**Engine**
Fall Pipe Vessel	Engines

WTG Installation	
Vessel	**Engine**
Jackup Installation Vessel	Main Engines 1-1
Jackup Installation Vessel	Main Engines 1-2

Jackup Installation Vessel	Main Engines 1-3
Jackup Installation Vessel	Main Engines 1-4
Jackup Installation Vessel	Main Engines 2-1
Jackup Installation Vessel	Main Engines 2-2
Jackup Installation Vessel	Main Engines 2-3
Jackup Installation Vessel	Auxiliary Engine
Jackup Feeder	Main Engine
Jackup Feeder	Main Engine
Jackup Feeder	Auxiliary Engine
Crew Transfer Vessel	Engines

Transit	
Vessel	**Engine**
Atlantic City Transits	Engine
New Jersey Wind Port (NJWP) Transits	Engine

The vessels and engines in the tables above were included in the modeling analysis because they are the worst-case equipment Atlantic Shores expects to use for their construction activities. For an in-depth discussion of the sources used in pile driving in the modeling for the foundation installation and OSS installation, *see* Response 5.8. O&M was not modeled as occurring at the same time as construction. Vessel survey emissions were included in the annual O&M modeling.

The final modeling submitted meets all of EPA's requirements, and neither the emissions in the C&C phase nor in the O&M phase will cause or contribute to any violations of any relevant NAAQS or PSD Increment.

Comment 5.13
Operations & Maintenance Emissions.

The air permit application does not explain what operation and maintenance activities are being modeled. It would appear that the modeled concentrations are low, considering the high risk of turbine component failure and the level of maintenance and repair expected for these large wind turbines. Prior studies of smaller turbines have indicated a high probability for major maintenance and repairs for a single turbine in one year, and here we have 200 turbines. In addition, the stresses on the larger turbines are greater than that for the smaller ones, pointing towards an even higher frequency of component failure occurrences. Therefore, the permit needs to explain what the frequency and risk of component failure is, how it would be addressed, and what emissions would be incurred during these periods.

Response 5.13
In response to this comment, EPA has sought additional information from Atlantic Shores, to supplement the information in its application, explaining and supporting the operations and maintenance assumption used for its air quality modeling. Atlantic Shores has explained that, to meet a series of design requirements for wind turbines known as IEC 61400, wind turbines including blades are designed and certified to 30 years lifetimes. The design considers normal and extreme conditions that are expected on the site as per applicable standards (including but

not limited to icing, rain, hurricanes, and lightning). BOEM's ROD requires that the design and manufacturing of the WTG components be certified to the requirements of IECRE OD-502, 2018 and verified per BOEM requirements.

In the application and in more recently-submitted supplemental information, Atlantic Shores explains that scheduled maintenance of WTGs includes regularly scheduled inspections and routine maintenance of mechanical and electrical components. The types and frequency of inspections and maintenance activities are based on detailed original equipment manufacturer (OEM) specifications. Annual maintenance campaigns are dedicated to general upkeep (e.g., bolt tensioning, crack and coating inspection, safety equipment inspection, cleaning, high-voltage component service, and blade inspection) and replacement of consumable components (e.g., lubrication, oil changes).

Atlantic Shores' supplemental information also explained that preventative maintenance (e.g., planned replacement of components such as motors and brakes) occurs less frequently (every 5 to 10 years) but is also regularly scheduled. Unscheduled inspections and minor repairs, such as replacement of small components, can be performed via the regular maintenance vessels. Replacement of large components (e.g., blades, generators, gearboxes, and large bearings) or structural repair may require support vessels, such as jack-up vessels with cranes, as well as larger teams of technicians.

The Air Quality Dispersion Modeling Report on pages 243-246 of 460 of the permit application includes a discussion and figures depicting the sources represented in the modeling of the Operations & Maintenance (O&M) phase. For the *short-term* NAAQS and increment modeling, two scenarios are included: (1) routine daily operations & maintenance activities and (2) simultaneous heavy repair. In addition, transit emissions for vessels traveling to and from the wind farm were also represented in the short-term O&M modeling.

To be conservative, O&M emissions were modeled as if they occurred continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year) using meteorological data for the 3-year period between 2018-2020. The only source in the short-term O&M modeling that used a slightly different methodology was the service operation vessel (SOV). The SOV will only operate 12 hours day, and otherwise be parked away from any structures, while minimizing fuel use, for the other 12-hour period. While operating, the SOV may operate at up to four turbine locations in a day. To represent this, the SOV emissions for the "work" half of one day were divided among these four turbine locations (which simulates the SOV servicing the 4 turbines), and the emissions for the "parked" half of the day were located at a fifth position located between the four turbines. This means that the overall emission rate was conserved, but at a given time, portions of the emissions are being modeled in five different locations simultaneously. This approach is depicted by Figure 4-5A in the Air Quality Dispersion Modeling Report, on page 244 of 460 of the permit application.

For the short-term modeling of the routine daily O&M activities, the sources represented in the modeling include: the SOV (main and auxiliary engines), daughter craft vessel engine, and 2 crew transfer vessel engines. These vessels and engines were included in the modeling analysis because this is the equipment Atlantic Shores expects to use for its routine O&M activities. A

complete list of modeled sources used in the modeling of routine daily O&M, including AERMOD source IDs, stack parameters, and emission rates, is provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, on page 318 of 460 of the permit application.

For the short-term modeling of the heavy repair activities, the sources represented in the modeling include: US Feeder Vessel (2 main & 2 auxiliary engines), European Jack-up vessel (5 main engines & 1 auxiliary engine), inter array cable repair vessel (main & auxiliary engines). These vessels and engines were included in the modeling analysis because this is the equipment Atlantic Shores expects to use for the highest-emitting type of heavy repair activity. A list of modeled sources used in the modeling for the heavy repairs activities, including AERMOD source IDs, stack parameters, and emission rates, are provided in Appendix B ("Model Inputs") of the Air Quality Dispersion Modeling Report, on pages 319 & 320 of 460 of the permit application.

O&M modeling for *annual* NAAQS and increment included modeling of visits to 200 WTG positions and 4 OSS positions over the course of a year. The sources represented in the modeling were the same as those used in O&M modeling for short-term NAAQS and increment. The modeling then used emission rates based on the expected yearly hours of operation for each of the O&M activities occurring at each WTG or OSS location. As some O&M occurs along the export cable, emissions from the export cable repair vessel and export cable survey vessel were included as well. For vessels represented in the annual O&M modeling, transit emissions from vessels traveling to and from the wind farm were also included.

Comment 5.14
Modeling Distances

It is not stated in the application and therefore unclear what distances from source to receptor are being used in the air quality PSD modeling. The discussion in Appendix C on the plume blight visibility analysis uses (Table 1) the centroid of the wind complex as the source location or 18 miles to the Wilderness Area receptor. The locations of the 24-hour construction emission sources in Figure B.3 of the application also places the foundation and WTG installs close to the center of the project complex, as opposed to the western boundary, which is considerably closer to the [Brigantine Wilderness Area].

There is a very significant difference between the distance from the centroid versus the distance from the closest turbine to shore, which is only 9.4 miles. Use of the centroid will significantly underestimate the 98th percentile value for a given year because it will not address the higher concentrations that are expected from the foundation and WTG installs on the western side of the complex.

The yearly modeling should have included the foundation and WTG installs at each of their actual locations to determine an accurate data set of daily received concentrations at the Wilderness area from which the 98th percentile can be obtained.

Response 5.14
For the short-term NAAQS and increment modeling (1-hour, 8-hour, and/or 24-hour standards) for the C&C phase, the distance from the sources to the nearest (offshore) receptors were 500

meters. This is because, as authorized by the Coast Guard, there will be a 500-meter safety exclusion zone surrounding construction activities, which precludes the general public from being within 500 meters of the construction activities and thus supports excluding this area from ambient air. As previously mentioned in Response 5.2, for the short-term construction modeling, the emission sources were placed in the northwest corner of the lease area, closest to the coastline of New Jersey and the Brigantine National Wilderness Area, where they were modeled continuously for 3 years. This was meant to ensure the highest impacts were modeled at the Brigantine National Wilderness Area and the 1-hour, 8-hour, and 24-hour NAAQS and increment were protected. No assumption using the centroid of the wind farm was used for the short-term construction modeling for NAAQS and increment.

For short-term NAAQS and increment modeling for the O&M phase, the distance from the sources to the nearest (offshore) receptor is 25 meters, with the exception that it will use a 500-meter safety exclusion zone for heavy repair activities. Once again, emission sources were placed in the northwest corner of the lease area, closest to the coastline of New Jersey and the Brigantine National Wilderness Area, where they were modeled continuously for 3 years. This was again meant to ensure the highest impacts were modeled and the 1-hour, 8-hour, and 24-hour NAAQS and increment were protected. And again, no assumption using the centroid of the wind farm was used for the short-term O&M modeling for NAAQS and increment.

For both the C&C and O&M phases, the modeling to show compliance with *annual* NAAQS and increment did not use a safety exclusion zone. Receptors were placed throughout the wind farm, as well as in the ocean between the project and shore, and onshore. The annual modeling for the C&C phase modeled emissions from the 141 turbine positions that are closest to the shore and from the positions for four large OSSs[4], to represent a worst-case year of construction. The annual modeling for the O&M phase modeled emissions from all 200 turbine positions and from positions for four large OSSs, since it is expected that all 200 turbine positions and the OSSs will be visited over the course of each year.

Comment 5.15

Non-Representative Meteorological Conditions.

The application is using three years of meteorological data taken at the Atlantic City International airport. Such data is not representative of the atmospheric conditions offshore over which the pollutants are transported. Similar data was used by Atlantic Shores in its construction and operation plan (COP) to describe the frequency at which wind turbines would be visible and was found to be very inaccurate. It was in fact dismissed by Rutgers University staff who had sponsored the original study, and who agreed that it was not representative of offshore wind visibility conditions.

It is not clear why the meteorological observations from the Integrated Surface Database discussed in Appendix E, that were used for the visibility blight analysis, were also not used for the air quality modeling. That database appears to have more offshore condition representation.

[4] Atlantic Shores has indicated it will use 4 large, 5 medium, or 8 small offshore substations. Atlantic Shores has indicated it would not construct more than 4 OSSs in one year. Construction of large OSSs would logically result in higher emissions than construction of 4 medium or small OSSs.

This issue should have been addressed in the permit application.

Response 5.15
The meteorology data in the modeling did not use the Atlantic City International airport. The meteorological data used within AERMOD (the model used for this project) was provided by EPA from the Weather Research and Forecasting ("WRF") model and extracted by EPA using the Mesoscale Model Interface ("MMIF") for the 2018-2020 time period to create overwater meteorological files for input into AERMOD. The data extraction point for the meteorological dataset was 74.126° W, 39.248° N, which is overwater and located within the Atlantic Shores wind farm. The data was then processed by AERCOARE to generate the surface and profile meteorological data necessary for input into AERMOD. This alternative model approach was approved by EPA's Model Clearinghouse for the Atlantic Shores project on July 28, 2022. This approach has also been approved on over a dozen occasions for modeling the NAAQS and increment compliance for offshore wind projects. *See also* Response 5.19.

The modeling for the Air Quality Related Values (AQRVs) used the same meteorological data as the air quality modeling analyses conducted to demonstrate compliance with the NAAQS and PSD increment standards. The meteorological data used for the modeling for the AQRVs is discussed in Appendix C ("Class I Air Quality Related Values Analysis") on pages 353-354 of the Air Quality Dispersion Modeling Report. On page 353, under Section 2.2, Meteorological Data and Modeling Domain, the report states:

> *The three years (2018-2020) of meteorological data were produced by EPA using the Weather Research and Forecast Model (WRF).*

The Integrated Surface Database discussed in Appendix E is a global database that consists of surface meteorological observations. The Integrated Surface Database was used, not for the AQRV modeling, but as part of an evaluation of how well the WRF model was performing when used for this project. The reason why the WRF data was used is because its data extraction point was overwater and located within the Atlantic Shores wind farm. By contrast, the data in the Integrated Surface Database mentioned by the commenter consists of meteorological data from onshore meteorological stations and from unrepresentative buoys located at a considerable distance from actual project site.

The WRF model data that was extracted using MMIF was preprocessed with AERCOARE. AERCOARE uses the Coupled Ocean Atmosphere Response Experiment ("COARE") air-sea flux code to read hourly prognostic meteorological data and addresses conditions in the marine environment. Essentially, AERCOARE was utilized to ensure the meteorological data is appropriate for overwater applications within AERMOD.

Comment 5.16
Foundation Size

The permit application does not specify the foundation size. The BOEM final EIS and Biological Assessment under the Endangered Species Act are based on foundations of 15 meters in diameter which are quite large and have not been installed previously, potentially involving longer pile

driving and foundation installation times.

Response 5.16
In response to this comment, EPA sought supplemental information from Atlantic Shores. As described in COP Volume I, Table 1.1-1 as well as in the OCS Air Permit Application, Atlantic Shores has selected a Project Design Envelope (PDE) that includes monopiles up to 15 m in diameter for the WTG foundations and jackets with pin piles up to 5 m in diameter for the OSS foundations. A complete list of dimensions for both foundations can be found in Volume I of the COP in Table 4.2-1 and 4.4-2. The analysis included in the OCS Air Permit application covers the full PDE of foundation sizes.

As previously stated, for C&C phase modeling to show compliance with short-term NAAQS and increment, sources associated with pile driving were modeled as if operating continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year) using meteorological data for the 3-year period between 2018-2020. *See* Response 5.2 and Response 5.8.

For a discussion on the hours of pile driving assumed in modeling to show compliance with the annual NAAQS and increment, *see* Response 5.8.

Comment 5.17
The Annual Average $PM_{2.5}$ concentration.

The air permit application does not explain how the annual $PM_{2.5}$ calculation was done and what was averaged over a year. The application modeling results show a 24-hour $PM_{2.5}$ level at the Wilderness Area of 0.69 µg/m3 and an annual average of 0.003 $\mu g/m^3$. If the modeling portrayed 141 turbines being installed in one year and that involved many days then it is unclear why the annual average would be orders of magnitude lower than the daily number. This should be explained. If it is due to the use of very short time periods for pile driving averaged with long periods of little activity, then the annual calculation would be underestimated for reasons similar to what was discussed in Section 5 above.

Response 5.17
To show compliance with annual $PM_{2.5}$ NAAQS and increment (both Class I and Class II), modeling is used to calculate the highest yearly mean concentration recorded at each receptor. To do this, hourly $PM_{2.5}$ concentration values at each receptor are summed up and divided by 8760 hours per year, which provides the yearly mean. This process is repeated for 2018, 2019, and 2020 for each receptor. Then, the yearly means for each of the three years are compared, and the highest value is selected as the annual increment value. The estimated annual hours of operation of each modeled activity reflected conservative estimates that a high number of turbines would be installed in a given year; it is likely actual construction will not install this number annually.

The reason there is such a large variation between the annual Class I $PM_{2.5}$ increment and the 24-hour Class I $PM_{2.5}$ increment is related to the meteorology. An annual mean will feature a wide range of meteorological conditions over the course of the year, including variations in wind direction and speed. The highest hourly concentrations will typically be located downwind of the

wind farm, but the receptors that are downwind will vary with the direction of the wind. Figure 4-13 in the Air Quality Dispersion Modeling Report, on page 259 of 460 of the permit application, is a wind rose for the overwater meteorology data used. A wind rose provides a distribution of the wind speeds and directions at a given location. During the 2018-2020 period, the most frequent wind direction is coming from the southwest (moving southwest to northeast). The Brigantine National Wilderness Area is located to the northwest of the wind farm. Thus, the highest impacts at the Brigantine National Wilderness Area will be favored when wind directions are originating from the southeast (moving southeast to northwest), which only occurs a smaller percent of the time.

The 24-hour Class I $PM_{2.5}$ increment value is naturally higher because emissions are averaged over a shorter period (24 hours vs one year). Winds and meteorological conditions originating from the southeast (moving southeast to northwest) and thus leading to the highest concentrations at the Brigantine National Wilderness Area are more likely to be sustained over the course of day, whereas they vary significantly over a year (as discussed above).

As discussed in Response 5.8, for the hydraulic hammer engine and 20 air compressors that would be involved during the pile driving for the foundation installation, annual emission rates were based off peak year hours of operation of 1,646 hours/yr. If we divide 1,646 hours of operation a year by 141 WTG foundation installations, this results in an estimate that each of 141 WTG foundation locations will require approximately 11.67 hours of pile driving. This differs from calculations to show compliance with short-term NAAQS and increment, since the annual emission rates used to show compliance with one-year standards account for how many hours during the year a given engine's emissions are expected, whereas the short-term standards calculations instead use an emission rate based on constant operation of a given engine every hour of the year.

Comment 5.18
Commenter thinks this project should be denied not only because the Atlantic Shores wind turbines reasonably have the potential to exceed EPA emission standards, but the cumulative effects of this wind farm must be taken into context with other wind farms: notably the New York Bight projects. Consequently, as a matter of protective policy, the air quality impacts of other offshore wind projects planned for the New York Bight should also be considered and added to the impacts contemplated in Atlantic Shores' draft air permit. This must also include the pre-construction surveying activities conducted during the planning and design phases of Projects 1 and 2.

Response 5.18
Commenter expressed concern regarding the cumulative effects of this project with the New York Bight projects. EPA assumes that this reference to the New York Bight projects is to a series of 6 OCS wind leases auctioned by BOEM on Feb. 23, 2022, and for which BOEM issued a Draft Programmatic Environmental Impact Statement on Jan. 8, 2024. At this time, no OCS air permit applications have been submitted to EPA by any of these six proposed New York Bight projects. Also, at this time, it is not certain how much construction overlap there will be from any of the New York Bight projects with the construction activities for Atlantic Shores. In addition, it would be difficult to quantify emissions from any vessels or engines for any of these projects

without complete air permit applications. Each application is reviewed once complete and it needs to address the air quality impacts from the construction and operation activities of other wind farms that have received OCS permits or have complete OCS air permit applications pending as of 30 days before a project submits its application, if they occur concurrently. *See* EPA, New Source Review Workshop Manual, at C.34 (October 1990). Modeling for future wind farm projects seeking an OCS air permit near Atlantic Shores will have to account for Atlantic Shores' expected emissions.[5] However, Atlantic Shores was not required to model cumulative impacts from the New York Bight projects.

It is not clear which activities the commenter is referring to as pre-construction surveying activities conducted during the planning and design phases of Projects 1 and 2. However, activities occurring prior to the construction of the permitted project are outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act, and will not occur concurrently with the permitted project.

Regarding the commenter's concern that the project has the potential to exceed EPA emission standards, the modeling and air quality analyses conducted for this project do not indicate that the project will result in any exceedance of NAAQS or PSD increment under the terms and conditions of the OCS air permit. *See* Responses 5.1, 5.2, 5.3, 5.6, 5.8, 5.12, and 5.13 for discussion of the conservative modeling assumptions used to ensure that the project would not cause an exceedance of NAAQS or PSD increment.

Comment 5.19
Use of a New Air Quality Model.

The permit application is using a new model, the AERCORE/AERMOD approach as opposed to the traditional EPA Guideline model, the Offshore and Coastal Dispersion (OCD) model. The application presents alleged attributes of the new model, but the OCD model was also capable of dealing with offshore pollutant transport. The application presents no study confirming that the new model has been verified by measurement for accuracy for the offshore conditions here. Therefore, at a minimum there should be a demonstration that the new model is conservative with respect to the OCD model. The OCD model should be run with the same parameters as the new model and the two compared before the new model is used here. If the new model is not conservative with respect to the OCD model, then an explanation is in order as to the reasons for that.

Response 5.19
While the Offshore and Coastal Dispersion (OCD) model is currently listed as the preferred model for over-water dispersion in EPA's *Guideline on Air Quality Models* (40 C.F.R. Part 51, Appendix W), the dispersion algorithms used in the AERMOD model include the latest

[5] To the extent the commenter intended to express concern about impacts from other wind farms besides the New York Bight projects, the nearest project that has received an OCS air permit or has a pending complete OCS air permit application is Empire Wind, which received an OCS air permit on February 15, 2024. However, Empire Wind is at a considerable distance away, such that emissions from this project will not impact air quality in the area affected by emissions from Atlantic Shores Projects 1 and 2. Empire Wind is approximately 108 kilometers from the Brigantine National Wilderness Area.

advancements in dispersion theory and are considered state-of-the-art. Section 3.2 of the *Guideline on Air Quality Models* provides a process for an applicant to receive approval to use an alternative model, and Section 3.2.2 lays out the requirements for an applicant to demonstrate that use of an alternative model is appropriate. Furthermore, EPA has proposed the COARE algorithm used in AERCOARE be added to AERMET, the preferred meteorological data preprocessor named in Appendix W and the one that is used in AERMOD. *See* Response 5.15 for a brief description of COARE.

To justify using the AERCORE-AERMOD approach, the applicant provided the following justification on pages 2-3 of their alternative model request (document named "3.3.1 Atlantic Shores Alternative Model Approval Request" in the docket) submitted to EPA on May 31, 2022:

> *AERCOARE-AERMOD is preferred by Atlantic Shores over OCD because of the following technical advantages, options, and features available in the model:*
>
> 1. *The Plume Rise Model Enhancements (PRIME) downwash algorithm can be used to assess impacts in the cavity and wake regions of structures. While the OCD model does incorporate platform downwash, Atlantic Shores has proposed use of PRIME considering the platform as a solid structure which will result in conservative, overprediction of concentrations.*
> 2. *The Plume Volume Molar Ratio Method (PVMRM) and Ozone Limiting Method (OLM) may be used by the Project to estimate the conversion of oxides of nitrogen (NOx) to nitrogen dioxide (NO2). If PVMRM or OLM are not used, the Ambient Ratio Method (ARM2) screening technique will be used within the model[.]*
> 3. *Output can be generated in the statistical form that is needed to assess compliance with the newer statistically based National Ambient Air Quality Standards (NAAQS), such as 1-hour NO2, and PM2.5.*
> 4. *The AERMOD-AERCOARE model can model multiple line sources, and more than 5 areas sources within the same model run and does not limit the number of sources that can be modeled simultaneously.*
> 5. *The AERMOD-AERCOARE model can model volume sources[.]*
> 6. *Calm wind conditions can be processed by the AERMOD-AERCOARE model.*
> 7. *The dispersion algorithms used in the AERMOD portion of AERCOARE-AERMOD are considered state-of-art by USEPA. OCD dispersion algorithms have not been updated to account for current advancements in the understanding of the boundary layer.*
> 8. *AERCOARE-AERMOD does not artificially limit the number of receptors that can be considered in an analysis.*
> 9. *Several of the programs (MAKEUTM, MAKEGEO) used to generate inputs into the OCD model require changes to the program Fortran code to generate the correct inputs for OCD.*
> 10. *AERCOARE will directly accept Weather Research and Forecasting (WRF) data model predicted hourly meteorological output from the Mesoscale Model Interface (MMIF) program.*

As part of the alternative model request sent to EPA Region 2, the applicant provided information to demonstrate that the AERCORE-AERMOD approach is not inappropriately

biased for regulatory application, as required by Section 3.2.2 of the *Guideline on Air Quality Models*.[6] *See* pages 14-16 of the "3.3.1 Atlantic Shores Alternative Model Approval Request" ("Alternative Model Request") document in the docket for this permitting action. On page 15 of its Alternative Model Request, Atlantic Shores concluded from past studies that "[t]he AERMOD predictions using AERCOARE-prepared meteorological data tend to be biased toward over-prediction for the highest concentrations, with less than a factor of 2 under-prediction at the lower concentrations. Importantly, AERCOARE-AERMOD does not appear to be biased toward underestimates for the higher end of the frequency distribution."

After reviewing the applicant's alternative model request, EPA Region 2 concluded that "… it is evident the AERCOARE/AERMOD approach does not result in systematic underprediction of concentrations. Instead, the evidence more likely leads to the conclusion the approach is conservative." *See* pages 7-8 of the document named "3.3.2 22-II-02_Region2_MCHRequest_AtlanticShores" in the docket for this permitting action. Region 2 approved the applicant's request to use the AERCOARE-AERMOD alternative model on July 20, 2022. On July 27, 2022, EPA's Model Clearinghouse concurred with Region 2's conclusion. *See* the document named "3.3.3 22-II-02_MCHResponse_Region2_AtlanticShores" in the docket for this permitting action.

Furthermore, on page 16 of the Alternative Model Request, Atlantic Shores notes that EPA Region 1 came to a similar conclusion when it approved an alternative model request for the Park City Wind offshore wind project: "Region 1 concludes it is evident the AERCOARE/AERMOD approach does not result in systematic underprediction of concentrations. Instead, the evidence more likely leads to the conclusion the approach is conservative." The use of AERCOARE/AERMOD for offshore facility modeling for PSD purposes has been approved in over a dozen instances to date.

Comment 5.20 (23,
The Atlantic Shores Project has not included a reasonable accounting of the total lifetime emissions cost to our State. Where there is an attempted analysis, the ranges of potential outcomes are far too large to justify a project of this scale. The model's assumptions are not sound. This needs to be sent back to the drawing board before a permit can be granted.

In analyses measuring the net emissions caused under this project, there is lack of reasonable accounting for the increased distances and engine run time from commercial and recreational vessels that may operate in the area. These vessels may want to avoid several routes through these turbine areas due to the increased risk of accidents. According to the National Academies, "offshore wind farms can interfere with ship radar and navigation." Several of these area avoidances will therefore result in increased lifetime emissions.

Response 5.20
In accordance with CAA requirements, the permit is supported by analysis of short-term and annual air impacts that correspond to the NAAQS and PSD increments, as well as analysis of AQRV impacts on Class I areas. *See* Responses 5.1 to 5.17 for discussions regarding the assumptions used for both annual and short-term NAAQS and PSD increment modeling.

[6] *See* 40 C.F.R. Part 51, Appendix W § 3.2.2(e)(iv).

Assumptions used in the air quality modeling analyses ensure the highest impacts under three years of meteorological conditions were modeled and the NAAQS and PSD Increment would be protected throughout the construction and operation of the permitted wind farms. The modeling included emissions from vessels associated with the project and transiting to and from the wind farms or conducting work at the wind farms; this is distinct from the transit of vessels unassociated with the project that choose to travel around the project area. The final modeling submitted meets all of EPA's rules, and air emissions in neither the C&C or O&M phase will cause or contribute to any violations of any relevant NAAQS or PSD Increment.

Note that any emissions from increased distances and engine run time from non-project vessels in the area are not expected to significantly impact air quality. While there will be temporary 500-meter safety exclusion zones near turbines, commercial and recreational vessels operating in the area will only be required to avoid these turbine locations during construction activities, which will occur within a 2-year period, or during heavy repairs during the O&M phase.

See Responses 5.1, 5.2, 5.3, 5.6, 5.8, 5.12, and 5.13 for more information regarding the worst-case assumption made in NAAQS and PSD increment modeling analyses for this project.

Comment 5.21
This comment is about the ocean breeze. I saw this week when the wind was blowing over the ocean, it was so easy to cool off our shores, and that is why people come here, but with the wind turbines, it will capture the wind, and we will not get the ocean breeze, and that will mean that we will have to use more electricity, in order to have more air conditioning.

Response 5.21
This topic is addressed for the Atlantic Shores project in a February 2022 white paper prepared for BOEM, entitled "Supporting National Environmental Policy Act Documentation for Atlantic Offshore Wind Energy Development Related to Microclimates" (*available at:* https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Microclimate%20white%20paper.pdf). The white paper explains how microclimates are formed within offshore wind facilities and finds that while microclimate effects are important for planning purposes, the effects are negligible onshore and to the overall climate. Briefly, there are effects under certain conditions, but they are small and difficult to distinguish from natural variability even with sophisticated techniques. They are not necessarily particular to being a wind turbine, as one would find similar effects for any large structure including buildings onshore. The paper concludes that although some small-scale climatic shifts could occur offshore, sea breezes (where the cooler air over the ocean is pulled shoreward as the hotter air rises above the land) would not be disrupted by the presence of wind turbines offshore.

A second study that also considered the surface impacts of large offshore wind farms is a May 25, 2022 study by Maryam Golbazi *et al.*, entitled "Surface Impacts of Large Offshore Wind Farms." 2022 Environ. Res. Lett. 17 064021, *available at* https://iopscience.iop.org/article/10.1088/1748-9326/ac6e49/pdf. The study was focused on the meteorological impacts of larger wind farms with turbines exceeding power ratings of 10 MW. The study used the Atlantic Shores site in this permit as one of the sites in its modeling. The study found wind speed reductions at the surface within the wind farm to be less than 0.5 m/s

(less than a 10% reduction) and were found to be negligible near the coastline. Surface temperatures during the summer were found to cool slightly (by around 0.06 degrees Celsius) both within the wind farm and at the coastline. Overall, the study concludes that any impacts on wind speeds and temperatures would be small and nearly impossible to recognize.

Comment 5.22
According to commenter, this project should be denied because based on page 24 of the Fact Sheet, 40 C.F.R. Part 55 Air Quality Standards are exceeded, by the Atlantic Shores wind turbines in Brigantine.

Response 5.22
Page 24 of the Fact Sheet states that the Atlantic Shores project is a major facility that triggers the Prevention of Significant Deterioration (PSD) federal regulations (it exceeded, the threshold for those requirements to apply). Since the project's emissions trigger PSD for several pollutants, including NO_2, CO, PM, PM_{10}, $PM_{2.5}$, and GHG, the following PSD requirements apply to the Atlantic Shores project:

1. Perform a Best Available Control Technology (BACT) Analysis
2. Establish BACT Limits
3. Perform Air Quality Impact Analyses
4. Perform Additional Impact Analyses

The permit applicant was required to conduct a BACT analysis and the permit includes BACT limits for NO_x, CO, PM, PM_{10}, $PM_{2.5}$, and GHG emissions from the marine and non-marine engines located on vessels that will be OCS sources, and on WTGs or OSSs, as well as for GHG emissions from the SF_6-insulated electrical switchgears.

The air quality analyses demonstrated that emissions in the C&C and O&M phases will not cause or contribute to any violations of the NAAQS or PSD Increment, including at the Brigantine National Wilderness Area. Furthermore, an additional impacts analysis was conducted to assess the project's impacts on soils, vegetation, and visibility. *See also* Responses in Section 6.0.

Comment 5.23
As part of the public comment process, Atlantic Shores submitted the following comments to clarify the following specific items in the public record:

Additional Clarifications

a) The AERMOD model appropriately fulfills regulatory standards for CAA permits. Emissions used in the AERMOD modeling represent peak hour emissions. This is shown by the column labels on the model inputs in Appendix B to the Air Quality Dispersion Modeling Report, which is itself Appendix C to the Atlantic Shores Offshore Wind Outer Continental Shelf Air Permit Application. Peak emissions were calculated using the methodology described in Section 2.2 of the Outer Continental Shelf Air Permit Application, which reflects that the model assumes the peak hour emission rate for the whole 24-hour day for short-term modeling.

b) For all construction activities, short-term model input emission rates, in units of grams per second, were generated for the peak hour and assumed to run 24 hours per day for all short-term model runs, which is a conservative approach.

c) The different averaging times (short-term or annual) of the National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) Increments are represented differently in the air dispersion modeling performed for the Atlantic Shores Projects. These are described in Section 4.2 of the Air Quality Dispersion Modeling Report, which is Appendix C of the Atlantic Shores Offshore Wind Outer Continental Shelf Air Permit Application.
    - The annual emissions analysis and the 24-hour analysis of $PM_{2.5}$ are independent from each other and performed differently.
    - The short-term 24-hour analysis uses the peak hour emissions from the model inputs table for each source.
    - The annual analysis includes the worst-case year's predicted hours per year of operation for each source.
    - This is demonstrated in Appendix B to the Air Quality Modeling Report (Appendix C to the Air Plan Application).
    - For comparison with the $PM_{2.5}$ annual NAAQS and PSD Increments, the project is modeled assuming continuous emissions at the 141 nearest-to-shore wind turbine generator (WTG) locations over a three-year period, which reflects an overestimation of impacts instead of truncating the project.

d) Atlantic Shores is proposing to construct up to 200 WTGs. The peak year emissions accounts for 141 turbine installations, reflecting the highest possible amount of activity that may occur in one year based on the schedule presented in the Air Permit Application. As noted above, for modeling purposes, Atlantic Shores assumed this level of emissions would occur for *all three years*. Thus, there is no artificial segmenting of the project.

e) The hours of pile driving per day do not impact the short-term emissions since the emissions presented for short-term durations represent peak hour emissions occurring continuously over the 3-year modeled period.

f) When calculating the total length of the construction period, the duration of WTG installation does not need to be added to the duration of foundation installation at each individual location. This is because one vessel can install a foundation at one location while a different vessel installs a WTG in another location where the foundation has already been constructed.

g) The emissions and source parameters for short-term modeling of Construction can be found in Appendix B of the Air Quality Dispersion Modeling Report.

h) The calculations in Appendix B to the Air Permit Application contain tables which show the individual activity groups, such as Foundation Installation or WTG

Installation, associated with Construction and Operations phases of the project. These calculations also show details of the individual vessels within each activity group, including the vessel engine count, vessel engine size, home port, trip count, trip distance, operating days in the Wind Turbine Area, engine load factor for each engine type and activity, and emissions factors used in determining the peak hour emission rate that feed into the application and the short-term modeling. Similar information is also located in Appendix B of the Atlantic Shores Offshore Wind Outer Continental Shelf Air Permit Application.

i) Modeling for comparison against NAAQS and PSD increments is in accordance with 40 CFR Part 51, Appendix W. Modeling of Air Quality Related Values (AQRVs) is in accordance with the Federal Land Manager's Air Quality Related Values Work Group (FLAG) Revised Phase I Report.

j) A description of several reasons why the modeling of Air Quality Related Values (AQRVs) is conservative can be found in the section titled "Conservatism" in Appendix C of the Air Quality Dispersion Modeling Report, which is Appendix C of the Atlantic Shores Offshore Wind Outer Continental Shelf Air Permit Application.

k) The forms of the $PM_{2.5}$ 24-hour NAAQS and $PM_{2.5}$ 24-hour Increment are different from each other. These are described in Table 3-1 and Table 3-2 respectively.
   - The $PM_{2.5}$ 24-hour NAAQS is the 98^{th} percentile concentration averaged over three years,
   - The $PM_{2.5}$ 24-hour PSD Class I increment is the 24-hour maximum, not to be exceeded more than once per year.

l) The air quality dispersion modeling for the short-term $PM_{2.5}$ NAAQS and Increment were modeled assuming construction activities occurred at and around a single WTG location, continuously for a 3-year meteorological period, and as a result, it is highly conservative. The modeling results do not reflect an average of a single year of construction followed by two years of no construction emissions.

m) The air quality dispersion modeling for the short-term $PM_{2.5}$ NAAQS and PSD Increment considers continuous operation over each entire day, over the course of an entire year; including nighttime periods. This is despite the seasonal restrictions on pile driving, and thus, it is highly conservative.

n) Operations and Maintenance Emissions are described in Section 4.2 of the Air Quality Dispersion Modeling Report. The emission rates and source parameters modeled are in Appendix B of the Air Quality Dispersion Modeling Report.

o) The three years of meteorological data used for the Air Quality Dispersion Modeling analysis are described in Section 4.5 of the Air Dispersion Modeling Report. The project used prognostic data. The prognostic data is reflective of overwater meteorological

conditions in the vicinity of the Projects. The representative analysis demonstrating the representativeness of the prognostic data can be found in Appendix E of the Air Quality Dispersion Modeling Report.

p) The air quality dispersion modeling analysis for the NAAQS and PSD Increment used AERMOD/AERCOARE. As described in Section 4.1 of the Air Quality Dispersion Modeling Report, a request was made to utilize AERMOD/AERCOARE instead of the Offshore Coastal Dispersion (OCD) model to EPA Region 2. The process used to document that the use of AERMOD/AERCOARE is acceptable is spelled out in 40 CFR Part 51 Appendix W Section 3.2.2(e). Approval was granted to use AEREMOD/AERCOARE provided a demonstration that shoreline fumigation is not a concern. The shoreline fumigation demonstration is included in Appendix D of the Air Quality Dispersion Modeling Report.

The Project's Clean Air Act Notice of Intent was submitted to EPA on December 22, 2021 and is published online at https://www.regulations.gov/document/EPA-R02-OAR-2024-0312-0024 an exceedance of NAAQS or PSD increment.

r) Table 2.3 of the New Jersey Regional Haze SIP (https://dep.nj.gov/airplanning/state-implementation-plans-sips/regional-haze-sip-2020/) indicates that the uniform annual rate of improvement required to achieve natural visibility (for the 20% most impaired days) by 2064 is 0.28 deciviews. This rate is based on the Uniform Rate of Progress (URP), also known as the glide path. The 0.28 deciview benchmark is not an annual requirement but rather a standard for evaluating progress against the Reasonable Progress Goal (RPG).

s) Figure 2-2 of the New Jersey Regional Haze SIP shows that the projected 2028 visibility at the Brigantine Wilderness Area is well below the URP level. Additionally, the figure indicates that the observed 2016 visibility at Brigantine is approximately 6 deciviews below the URP glide path. The average observed visibility from 2018-2022 (see figure below) shows more than 6 deciviews below the URP glide path. Therefore, any potential increases in visibility degradation at Brigantine due to the project would not endanger Brigantine's visibility remaining below the URP glide path and meeting the regional haze rule goals.

2.5 Uniform Rate of Progress

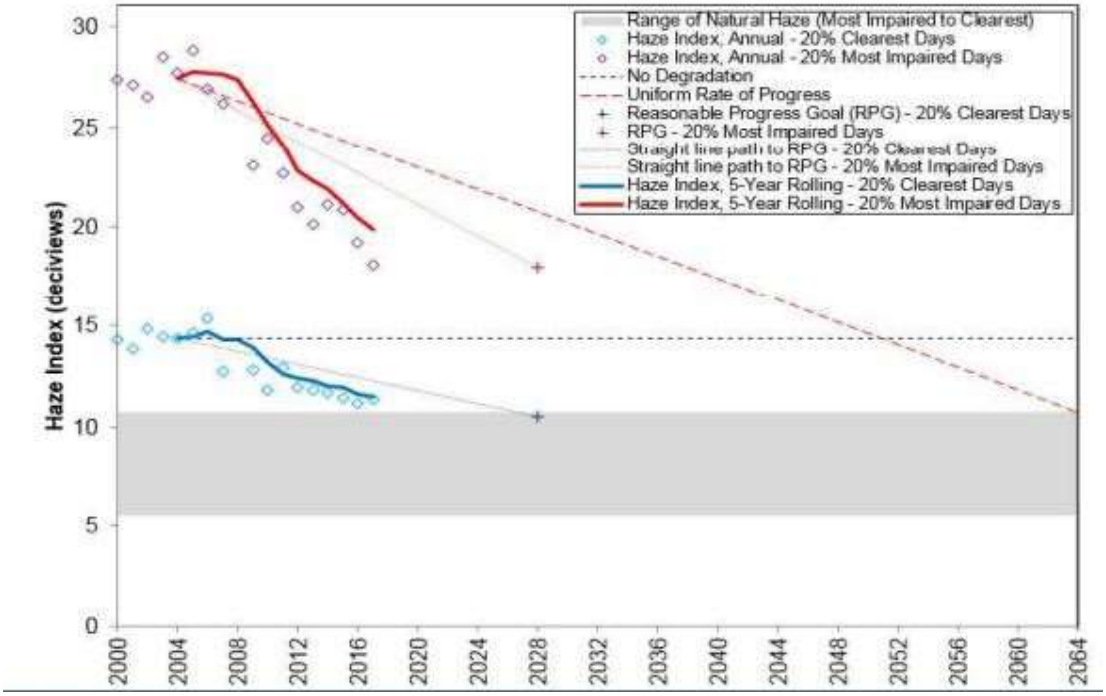
The uniform rate of progress (URP) defines, in deciviews per year, the rate of visibility improvement that would be maintained to attain natural visibility conditions by the end of 2064. The URP or glide path is represented in Figure 2-2 as a straight line between baseline conditions and 2064. DEP's calculations using most impaired days show the URP to be 0.28 deciviews per year. See Table 2-3. As seen in Figure 2-2, the reasonable progress goals established for 2028 at the Brigantine Wilderness Area are expected to provide visibility improvements at a greater rate than this rate.

Table 2-3: Uniform Rate of Progress for Brigantine Wilderness Area

2000–2004 Baseline Visibility (20% Most Impaired)	2064 Natural Visibility (20% Most Impaired Days)	Total Improvement Needed by 2028	Total Improvement Needed by 2064	Uniform Annual Rate of Improvement
27.43	10.69	6.72	16.74	0.28

The calculated URP line is drawn for the most impaired visibility days only. USEPA recommended in its draft guidance that states recalculate the value of the 2000–2004 baseline, or use an updated value provided by USEPA or the IMPROVE program. Figure 2-2 shows that Brigantine Wilderness Area is well below the 2018 URP level for the first SIP Planning period and currently below the 2028 URP level for the second planning period.

Figure 2-2: Visibility Metrics levels at Brigantine Wilderness Area



Response 5.23
EPA notes the clarifications made by the applicant above.

Section 6.0 – Class I Area Impact Review Conducted by the US Fish and Wildlife Service (US FWS)

Comment 6.1
The EPA, in its letter of December 1, 2022, indicated that the application would not be complete pending confirmation from the Fish and Wildlife Service (FWS) that it is satisfied with the impact analysis for the air quality related values at the Brigantine Wildlife Area. We have not seen such confirmation, again raising questions as to why the application was deemed complete and released for public comment. The FWS position on this application should be disclosed.

Response 6.1
The following response was provided by the United States Fish and Wildlife Service (US FWS):

> *On August 18th, 2023, the U.S. Fish & Wildlife Service (FWS) sent an email message to the Environmental Protection Agency, Region 2 air quality staff stating that we considered the Atlantic Shores - South air quality permit application complete. Though we agreed that the required portions of the permit application were present, the FWS followed a common practice of requesting the applicant to respond to additional questions or additional analysis requests into the future. We did participate with EPA, ask questions of the applicant, and review new materials as they were produced through the full permitting process. The FWS works with all applicants to minimize air quality impacts to Class I areas and public lands that we manage.*

Comment 6.2
There are differing assumptions for Air Quality Modeling versus Air Quality Related Values Modeling. They appear to be different approaches taken regarding the two sets of modeling. The application should explain why.

Response 6.2
The following response was provided by the US FWS:

> *The U.S. Fish & Wildlife Service follows the Federal Land Managers' Air Quality Related Values Work Group, Revised 2010 (FLAG) federal guidance document in how it evaluates impacts to Class I areas during air permit application review. Air Quality Related Values (AQRV) evaluation primarily looks at short-term visibility impairment and long-term aerosol deposition which differs from the human health standards EPA protects. We often use different models, timescales, and emission character layouts to better evaluate the AQRV impact. Though somewhat different from EPA's approach, the intent is to represent an applicant's activity in as consistent manner as possible.*

Clean Air Act regulations provide that the Federal Land Manager, in this case the US FWS, has the affirmative responsibility to protect the AQRVs in Class I areas, including visibility and deposition. Thus, modeling for the AQRVs assessed visibility and aerosol deposition, rather than compliance with NAAQS and PSD increment. The modeling for the AQRVs consisted of the following analyses: near field (<50km) plume visual impact analysis using the VISCREEN model, a more detailed plume visual impact analysis using the CALPUFF model, and deposition analysis which analyzed nitrogen and sulfur annual impacts using CALPUFF. While Response

5.19 explains that the AERMOD model was appropriate to use for modeling to demonstrate the air concentrations of criteria pollutants would not violate NAAQS or PSD increment, other models such as VISCREEN and CALPUFF are more appropriate to assess the impacts to visibility and aerosol deposition.

See Section 5.0 for an in-depth discussion of the assumptions made for the air quality modeling analyses conducted to demonstrate compliance with the NAAQS and PSD increment standards.

Comment 6.3
The EPA, and by extension, BOEM, need to take into consideration the cumulative effects of not only the Project's Atlantic Shores wind turbines, but also the wind turbines of the nearby Ocean Wind lease area, which is eligible to go back on the market for another lease, in addition to the NY Bight projects, as well as consider other BOEM leases in the surrounding area.

Brigantine, less than five miles from Atlantic City, unfortunately straddles all these projects, and **there is a total of more than 1,800 wind turbines now projected for the area.** *(Emphasis added by the commenter.)*

Response 6.3
For a discussion related to consideration of cumulative effects, including from the New York Bight projects, in modeling for NAAQS and PSD increment, *see* Response 5.18. With regards to the nearby Ocean Wind project, on February 29, 2024, BOEM approved Ocean Wind's request to suspend its lease until February 28, 2026. On May 22, 2024, pursuant to Ocean Wind's request, EPA suspended its review of Ocean Wind's air permit application, which was incomplete at the time. Thus, it is not necessary for Atlantic Shores to consider Ocean Wind impacts in its NAAQS and PSD increment modeling.

The effects of each nearby wind farm project on the NAAQS and PSD increment and on the Brigantine National Wilderness Area will be evaluated, including its cumulative effects with other nearby wind farms with issued OCS air permits or with complete OCS air permit applications, as OCS air permit applications come in for review.

Section 7.0 – Comments from Atlantic Shores Offshore Wind

Note that in addition to the comments below, Atlantic Shores provided clarifying statements related to its Air Quality Analysis that they wanted to include in the public record. These have been included at the end of Section 5.0 of this document. *See* Comment 5.23.

Comment 7.1
Comment regarding the specific draft OCS air permit condition below:

> **IV.A.1.a:** "During C&C, the three representative jack-up vessels identified in Table 1A to this permit that will be used for the WTGs installation activities, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit."

Jack-up vessels may be used during foundation installation and OSS installation activities as well as WTG installation activities. As described throughout the OCS Air Permit application

submitted on June 26, 2024, including in Section 4.3.1, the modeled Project Design Envelope (PDE) of the Project includes the maximum design scenario for project components including installation techniques. For OSS installation, the modeled maximum design scenario utilizes a heavy lift vessel, but other possible scenarios use jack-up vessels instead. Application sections 1.2.4.2 and 3.1.1 explain that jack-up vessels can support OSS or WTG construction. The use of jack-up vessels in foundation installation activities is described in section 1.2.2.1 and included in Table 1-4 of the Air Permit Application.

Atlantic Shores proposes including the potential for jack-up vessel use in OSS and foundation installation activities by changing the condition to read: "the three representative jack-up vessels identified in Table 1A to this permit, which can be used for the WTG, foundation, and OSS installation activities, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels…"

Response 7.1
The commenter is correct that the application states that jack-up vessels can be used to support OSS or WTG construction. This omission in the permit was an oversight on EPA's part. Therefore, the proposed change supports the original intention and adds more clarity to the permit condition.

EPA notes that using the jack-up vessel instead of the heavy lift vessel for OSS installation, as some scenarios in the application indicate, would result in actual lower air emissions. For purposes of modeling, Atlantic Shores modeled the worst-case scenario emissions, and thus assumed the use of the heavy lift vessel, rather than the jack-up vessel, for all OSS installations.

EPA agrees with the comment and has updated Condition IV.A.1.a. as follows:

a. *During C&C, the three representative jack-up vessels identified in Table 1A to this permit,* ***which will be used for installation activities related to the WTGs and/or OSSs and their foundations****, ~~that will be used for the WTGs installation activities~~, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit.*

Because of the above changes, EPA is also revising the relevant cell in Table 1A as follows to include OSS installation in the activity of the jack-up vessel:

Representative Vessel Types for WTG Installation (for both ASP1 and ASP2[a])	**Activity/Vessel Description**	**Identified in Application as OCS Source? (Y/N)[b]**	**Marine Engines (per each vessel): Type (Main or Auxiliary), Number & Maximum Engine Power (in kW/engine)**
Jack-Up Vessel	*WTG/**OSS** Installation*	*Y*	*Main engines (4): 3,535, all Category 3. Main engines (3): 2,650, all Category 3. Auxiliary engine (1): 2,650, Category 3.*

Comment 7.2
Comment regarding the specific draft OCS air permit condition below:

> **IV.A.1.e** "Each jack-up vessel deployed by the Permittee shall be the vessel with the highest-tiered engines ("highest-tier vessel") that was available at the time the vessel was hired for the specific work required in the timeframe required. The Permittee may only hire and deploy an available vessel with the next highest-tier engines, if the Permittee documents the basis for its conclusion that the highest-tier vessel, and any other higher-tiered vessels, are not available. [40 C.F.R. § 52.21; N.J.A.C. 7:27-18.3(b)(1)]"

a. Atlantic Shores proposes defining the term "available" by adding the sentence "A vessel is available if the Permittee determines it is capable of conducting the work required by the contract and was available for hire for the full timeframe in which the work is expected to be conducted."

b. Atlantic Shores also proposes that this condition include language such that vessels with lower-tiered engines may be used if the total emissions associated with the use of the lower-tiered vessel are the same or lower than the total emissions that would result from the highest-tiered vessel available. Such conditions have been included in the OCS Air Permits of Coastal Virginia Offshore Wind, Sunrise Wind, Revolution Wind, Vineyard Wind I, South Fork Wind, and New England Wind I.
The completed proposed condition is:

> *IV.A.1.e Each jack-up vessel deployed by the Permittee shall be the vessel with the highest-tiered engines ("highest-tier vessel") that was available at the time the vessel was hired for the specific work required in the timeframe required. The Permittee may only hire and deploy an available vessel with the next highest-tier engines if either of the following conditions are met:*
>
> *i. the Permittee documents the basis for its conclusion that the highest-tier vessel, and any other higher-tiered vessels, are not available. A vessel is available if the Permittee determines it is capable of conducting the work required by the contract, and was available for hire for the full timeframe in which the work is expected to be conducted; or*
> *ii. the total emissions associated with the use of a vessel with the higher Tier engine(s) would be greater than the total emissions associated with the use of the vessel with the next lower Tier engine(s). For purposes of this subparagraph, when determining the total emissions associated with the use of a vessel with a particular engine, the Permittee shall include the emissions of the vessel that would occur when the vessel would be in transit to the WDA from the vessel's starting location [40 C.F.R. § 52.21; N.J.A.C. 7:27-18.3(b)(1)]*

Response 7.2
The commenter requests two changes to Condition IV.A.1.e. in the permit. This condition of the permit requires that Atlantic Shores contract with "the vessel with the highest-tiered engines ('highest-tier vessel') that was available at the time the vessel was hired for the specific work required in the timeframe required." The first change that the commenter requests is that the

permit language be revised to define an "available" vessel as one "capable of conducting the work required by the contract and was available for hire for the full timeframe in which the work is expected to be conducted."

EPA agrees with the commenter that a vessel that is available for "the specific work required" is a vessel that is capable of conducting the work required by the vessel contract. With regards to when a vessel is available for "the timeframe required," this timeframe will depend on the specifics of the work required. Depending on the work, it may be that precise dates of availability are needed, or that work must be done in a general timeframe but that the precise timeframe contains some flexibility. In general, the timeframe for which Atlantic Shores has sought contract bids is likely to reflect the specific project's needs, and EPA would expect such requests for bids to be retained under the permit's recordkeeping requirements. The EPA believes that the required timeframe may often coincide with the timeframe in the contract with the hired vessel, if it is planned and contracted out with sufficient lead time. However, for example, if hypothetically Atlantic Shores seeks to hire a vessel for long-term needs during O&M, and is choosing between a cleaner jack-up vessel available for 3 years and a dirtier vessel available for 4 years, given that the O&M phase is expected to last 30 years, EPA would generally consider both to be available for the timeframe needed. Under Condition IV.A.1.e. we expect that each time the permittee contracts an OCS source vessel, for use either during the C&C phase or during the O&M phase throughout the operational life of the project, it would select the highest-tiered vessel (lowest polluting vessel) available at that time, taking into account any project timing flexibilities; a vessel not being available for the exact timeframe in the contract is not necessarily a reason for selecting a higher polluting vessel without further justification. EPA does not believe the draft permit language requires additional clarification. Thus, EPA is not making this suggested change in Condition IV.A.1.e.

The second change the commenter seeks is a revision to Condition IV.A.1.e. to allow consideration of emissions from vessels while transiting from their starting locations to the Wind Development Area as a basis for using a vessel with lower-tiered engines as opposed to the vessel with the highest-tiered engines that was available at the time the vessel was hired by Atlantic Shores.

Condition IV.A.1.e. of the draft permit requires that, for the 3 (during C&C) and 4 (during O&M) marine vessels that will be OCS sources, Atlantic Shores must hire (contract) the available vessel with the highest-tiered engines ("highest-tier vessel"). Atlantic Shores may only hire and deploy an available vessel with the next highest-tiered engines, if the Permittee documents the basis for its conclusion that the highest-tier vessel, and any other higher-tier vessels, are not available. Condition X.8.c. of the draft permit contains related recordkeeping requirements. EPA considers the requirement to use the highest-tier vessel to be part of the BACT and LAER requirements for this permit. Note that, for purposes of Condition IV.A.1.e., the tiers referred to are the engine tiers established in the 40 C.F.R. Part 1042 Tier emission standards (expressed as g/kW-hr), or equivalent international emission standards acceptable to EPA.

EPA has considered the commenter's second request and has concluded that the requested change is unwarranted. For this particular project, this permit condition applies specifically to the jack-up vessels that will be the only OCS source vessels for this project, which are large vessels

with emissions that compose roughly half of the project's C&C phase emissions that were modeled for impacts to communities onshore and the Brigantine National Wilderness Area (Class I Area). Vessel emissions while transiting from a starting point to the Wind Development Area may occur at a considerable distance from the project and may not impact the above-mentioned areas of concern.

Furthermore, particularly given the project's large size and proximity to shore and to a Class I Area, it is important that the permit conditions be protective of the onshore communities and of the Brigantine National Wilderness Area and, where possible, reduce actual emissions of air pollutants at and near the OCS Facility as much as possible, even if expected modeled emissions would not cause a violation of NAAQS or PSD increment. Ensuring that OCS source vessels that are chosen will have the lowest emissions at and near this OCS Facility is an appropriate BACT and LAER requirement. Allowing vessels with lower-tiered engines (higher emitting) to be chosen for this project based on lower total emissions from transiting from starting locations to the work site, where impacts (from either the cleaner or dirtier vessel) from such transiting air emissions may occur on the open sea at considerable distances from the OCS Facility and thus may have no impact on the areas of concern, would provide less protection for the local Class I Area and onshore communities.

Comment 7.3

Comment regarding the specific draft OCS air permit condition below:

> **IV.A.4.a-d and IV.A.5.f-i:** Category 3 Marine Engine NO_x emission limits of either 10.03 g/kW-hr or 11.55 g/kW-hr

Per page 26 of 67 of the draft Fact Sheet, Category 3 engines (engines with displacement ≥30 L/cyl) must meet the requirements of NSPS IIII. The NSPS IIII requirements differ for Category 3 engines as they do not directly point to the tier standards in 40 CFR 1042 as is the case for engines with displacement <30 L/cyl (Category 1 and 2 engines). For Category 3 engines, the NSPS directly incorporates the specific emissions limits consistent with those tier standards, based on applicable engine install year, into the specific engine requirements rather than incorporating them by reference. As such, consistent with the limits for Category 1 and 2 engines, and consistent with the monitoring requirements in the draft permit, we propose Category 3 engines to be limited to Tier 2 or better, which aligns with the specific NSPS Subpart IIII emissions requirements for engines with displacement ≥30 L/cyl found at 40 CFR 60.4204(c) (specifically 40 CFR 60.4204(c)(2) for NO_x). We propose language changes consistent with the other parts of the permit, and (consistent with other parts of the permit) a numerical NO_x emission limit consistent with the maximum Tier 2 emission limit as presented in both 40 CFR 1042 and NSPS IIII for Category 3 engines of 14.4 g/kW-hr. The actual limit will be dependent on final engine configuration, since the applicable Tier 2 emissions standard for each engine is based on its maximum speed. This comment is repeated for all Category 3 engine limits.

Response 7.3

This comment concerns permit requirements for the Category 3 marine engines (which are compression ignition internal combustion engines) that will be on the project's OCS source vessels during the C&C and O&M phases. Category 3 marine engines are marine engines with a

displacement of equal to or greater than 30 Liters/cylinder.

The draft permit contained NSPS IIII NO_x emission standards for Category 3 marine engines of 10.03 g/kW-hr[7] and 11.55 g/kW-hr[8], which also constitute the BACT and LAER emission limits (g/kW-hr)[9] for the same engines. The commenter requests that the draft permit's NSPS IIII, BACT and LAER limits be changed to 14.4 g/kW-hr. The commenter refers to the following draft permit conditions: IV.A.4.a, 4.b, 4.c, and 4.d, and IV.A.5.f, 5.g, 5.h, and 5.i.

NSPS IIII and its requirements include a NO_x emission standard that applies to each Category 3 engine on the project's OCS source vessels; that emission standard varies based on the engine's installation date and maximum engine speed in revolutions per minute ("rpm"), which is information that Atlantic Shores represented was not known at the time of the application. For example, for engines installed on or after January 1, 2012, and before January 1, 2016, the NO_x emission standard can range from 7.7 g/kW-hr for engines with equal to or greater than 2,000 rpm, up to 14.4 g/kW-hr for engines with less than 130 rpm (the least stringent standard for engines meeting the above-listed criteria). *See* 40 C.F.R. § 60.4204(c)(2).

The permit requires that each Category 3 marine engine of an OCS source vessel meet the NSPS IIII NO_x emission standards that apply to that engine based on its actual installation date and rpm, but that, for reasons explained below, these standards shall be no less stringent than 10.03 and 11.55 g/kW-hr, for auxiliary and main (or propulsion) engines respectively.

Since the Category 3 marine engines of the project's OCS source vessels are marine engines, they will also need to be certified to the relevant Tier emission standards for NO_x, CO, and HC in 40 C.F.R. Part 1042 ("Control of Emission from New and In-Use Marine Compression-Ignition Engines and Vessels") ("Part 1042"). Part 1042 includes three tiers of emission standards (Tier 1 through 3), which vary depending on the engine's model year and maximum in-use engine speed, expressed in rpm. For example, the Tier 2 NO_x emission standards in Part 1042 for Category 3 engines apply for model years 2011-2015 and range from 7.7 g/kW-hr for engines with greater than 2,000 rpm, up to 14.4 g/kW-hr for engines with less than 130 rpm (the least stringent standard). *See* Table 1 to 40 C.F.R. § 1042.104(a)(2) ("NO_x Emission Standards for Category 3 Engines").

The permit requires that each actual Category 3 marine engine on an OCS source vessel used for this project be certified to at least the Tier 2 emission standards of Part 1042. The reason for requiring the use of Category 3 marine engines that are certified to at least Part 1042's Tier 2 emissions standards is that the Tier 2 emission standards for CO and HC were used to set the BACT emission limit for CO and the LAER emission limit for VOC.

Note that unlike for Category 1 and 2 marine engines, the requirements of NSPS IIII do not allow compliance with the NSPS IIII NO_x emission standards for Category 3 marine engines to be demonstrated via certification to Part 1042 Tier NO_x emission standards. In accordance with

[7]10.03 g/kW-hr of NO_x corresponds to Category 3 auxiliary marine engines.
[8]11.55 g/KW-hr of NO_x corresponds to Category 3 main or propulsion marine engines.
[9]EPA has determined that for Category 3 marine engines, BACT and LAER for NO_x is the level of control provided by NSPS IIII, and thus the NSPS IIII NO_x emission standards become the BACT and LAER NO_x emission limits.

NSPS IIII, the permit requires that performance testing shall be conducted to demonstrate compliance with the NSPS IIII emission standards and BACT and LAER emission limits for NO_x specified in the permit for Category 3 marine engines of OCS source vessels.

In its application, Atlantic Shores used emission factors of 10.03 g/kW-hr for Category 3 auxiliary engines and 11.55 g/kW-hr for Category 3 main (or propulsion) engines[10], in combination with the assumed representative engine power (in kW), engine load factor, and engine hours of operation, to calculate the tons per year ("tpy") and grams/second ("g/s") of NO_x emissions that would result from each of the Category 3 marine engines on OCS source vessels. These NO_x emissions calculations were then used in the air quality impact analyses and in determining major NSR applicability, maximum NO_x daily emission rates, compliance with the NO_2 NAAQS and NO_2 PSD increment, and in determining the number of NO_x offsets required for the project.

The 10.03 g/kW-hr and 11.55 g/kW-hr NO_x emissions limits in the permit are consistent with the permit application and they fall within the range of both the NSPS IIII NO_x emission standards for such engines installed on or after January 1, 2012, and before January 1, 2016, and the Part 1042 Tier 2 NO_x emission standards for such engines discussed above.

By contrast, using the higher 14.4 g/kW-hr NO_x emission limit suggested by the commenter as the permit's NSPS IIII NO_x emission standard and BACT and LAER NO_x emission limits for Category 3 marine engines onboard OCS source vessels would match the least stringent NSPS IIII NO_x emission standard and Part 1042 Tier 2 NO_x emission standard for Category 3 engines. However, the applicant did not submit to the EPA for review an air quality impact analysis of NO_x emissions calculated based on 14.4 g/kW-hr. Therefore, allowing for a 14.4 g/kW-hr NO_x emission limit would be inconsistent with the NO_x emissions factors (g/kW-hr) of 10.3 and 11.55 g/kW-hr used in the application for the air quality impact analyses, which showed compliance with the NAAQS for NO_2 and NO_2 PSD increment and that the EPA had relied on to determine the maximum daily NO_x emission rate in the permit and major NSR applicability, among other things. Finally, the amount of NO_x offsets that the Permittee is required to obtain in order to offset its project NO_x emission increases were not based on the 14.4 g/kW-hr of NO_x.

We agree with the commenter that for Category 1 and 2 marine engines of OCS source vessels (which have a displacement of less than 30 Liters/cylinder), the BACT and LAER NO_x emission limits (g/kW-hr) established in the permit are derived from the minimum Part 1042 Tier 2 emission standard for NO_x + Total Hydrocarbons ("THC"). (Note that Part 1042 Tier 2 does not include an emission standard for Category 1 and 2 engines for NO_x alone.) Unlike for Category 3 marine engines, Category 1 and 2 marine engines are able to comply with NSPS IIII by using engines certified to comply with Part 1042 Tier 2 emission standards. And, unlike for Category 3 marine engines, the BACT and LAER emission limits for NO_x (g/kW-hr) included in the permit for the Category 1 and 2 marine engines are more stringent than the NO_x (g/kW-hr) emission factor[11] used in the application to calculate tpy and g/s of NO_x emissions resulting from those

[10]The 10.03 g/kW-hr and 11.55 g/kW-hr of NO_x represent the BOEM Wind Tool emission factors that the applicant selected to use for its Category 3 marine engines.

[11]The NO_x g/kW-hr emission factor used in the application for Category 1 or 2 marine engines represents the BOEM Wind Tool emission factor that the applicant selected to use for its Category 1 or 2 marine engines.

engines, numbers that were then used in air quality impact analyses and for major NSR applicability determination purposes.

Based on the above discussion, EPA has concluded that the requested change is unwarranted.

Comment 7.4
Comment regarding the specific draft OCS air permit condition below:

IV.B.1.b: $PM_{2.5}$ limit of 0.01 g/kW-h

Consistent with $PM_{2.5}$ limits throughout the permit, we propose changing this limit to 0.02 g/kW-hr. According to the methodology used elsewhere in the permit, $PM_{2.5} = PM_{10}*.92$, which would be 0.018 g/kW-hr, rounding to 0.02 g/kW-hr.

Response 7.4
Permit condition IV.B.1.b in the draft permit provides, *inter alia*, the $PM_{2.5}$ BACT emission limit for non-marine diesel generator engines used during both the C&C and O&M phases. This condition also sets BACT emission limits for PM and PM_{10}.

Under NSPS IIII, these non-marine engines must be certified to a PM emission standard of 0.02 g/kW-hr; this limit serves as the basis for the BACT emission limit for PM. EPA derived both the PM_{10} and $PM_{2.5}$ limits from the PM emission limit. Based on a July 2010 EPA technical report entitled "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition,"[12] and consistent with how PM_{10} and $PM_{2.5}$ emissions for non-marine engines have been derived in other OCS air permitting actions, EPA first assumed that all PM emissions will be smaller than 10 microns (PM_{10}), and thus set a PM_{10} BACT emission limit of 0.02 g/kW-hr for non-marine engines in condition IV.B.1.b equivalent to the conditions' emission limit for PM.

Then, again based on the July 2010 report and prior permitting actions' approaches, the $PM_{2.5}$ BACT emission limit in the permit was derived from the PM_{10} BACT emission limit by assuming that 97% of the PM_{10} emitted would be $PM_{2.5}$. 97% of the PM_{10} BACT emission limit of 0.02 g/kW-hr is 0.0194 g/kW-hr. EPA truncated this value to establish a 0.01 g/kW-hr $PM_{2.5}$ BACT emission limit in the permit. However, EPA recognizes that it is also justifiable to round this value up to 0.02 g/kW-hr. And EPA notes that the permit requires that compliance with the PM, PM_{10} and $PM_{2.5}$ BACT emission limits be demonstrated via EPA certification to the applicable NSPS IIII PM emission standard. Thus, revision in the permit of this $PM_{2.5}$ BACT emission limit from 0.01 to 0.02 g/kW-hr will not result in an actual change in engine emissions. We have made this change in the final permit as requested by the commenter.

Finally, we note that the methodology of determining $PM_{2.5}$ emissions by multiplying PM_{10} by 0.92 that the commenter refers to, is indicated in the permit as the methodology to be used for diesel marine engines, not for the non-marine engines covered under condition IV.B.1.b.

[12]This document is report number NRD-009d and is available at https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10081UI.pdf.

The $PM_{2.5}$ emission limit in Condition IV.B.1.b. is revised as follows:

Maximum Engine Power	***NO_x (g/kW-hr)***	***VOC (g/kW-hr)***	***CO (g/kW-hr)***	***PM (g/kW-hr)***	***PM_{10}* (g/kW-hr)***	***$PM_{2.5}$* (g/kW-hr)***
130 ≤ kW ≤ 560	*0.40*	*0.20*	*3.5*	*0.02*	*0.02*	*0.01~~2~~*

Comment 7.5
Comment regarding the specific draft OCS air permit condition below:

> **IV.D.2.a.1:** "On a monthly basis, the Permittee shall calculate and record the tons of monthly CO_2e emitted by the SF_6-insulated electrical switchgears combined, by using mass balance and accounting for leakage periods and by converting the SF_6 emissions to CO_2e based on the Global Warming Potentials ("GWP") listed in Table A-1 to 40 C.F.R. Part 98, Subpart A."

The SF_6 insulated electrical switchgears have very low rates of emissions from losses. We request that EPA consider changing this requirement to an annual calculation or coinciding with the OEM's [Original Equipment Manufacturer's] recommended scheduled maintenance schedule for the electrical switchgear.

Response 7.5
The SF_6-insulated electrical switchgears on the OSSs and WTGs will emit sulfur hexafluoride ("SF_6")[13], which is a GHG and is subject to BACT requirements for GHG emissions. The permit establishes a BACT GHG emission limit of 3,519 tons of CO_2e on a 12-month rolling total basis[14] for all of the SF_6-insulated electrical switchgears combined. *See* Condition IV.D.1.a. in the permit.

Conditions IV.D.2.a.1. and a.2. in the permit specify the calculation method to use to determine the actual tons of CO_2e emitted from SF_6 emission leaks during each rolling 12-month period, which the Permittee shall use to verify compliance with the BACT emission limit for CO_2e. Condition IV.D.2.a.1. requires that the Permittee calculate and record, each month, the actual tons of CO_2e emitted from all SF_6-insulated electrical switchgears combined. Then, Condition IV.D.2.a.2. requires that this monthly total tons of CO_2e be added to the monthly total tons of CO_2e for the previous 11 months to get the 12-month rolling total tons of CO_2e. This calculated 12-month rolling total tons of CO_2e is then used by the Permittee to verify compliance, each month, with the permit's BACT CO_2e emission limit for all of the OSSs' and WTGs' SF_6-insulated electrical switchgears combined.

The commenter requests that Condition IV.D.2.a.1. be revised so that the Permittee calculates and records the actual tons of CO_2e resulting from all SF_6-electrical switchgears combined either

[13]Sulfur hexafluoride (SF_6) is a synthetic fluorinated compound with an extremely stable molecular structure. It is also the most potent greenhouse gas known to date. Over a 100-year period, SF_6 is 22,800 times more effective at trapping infrared radiation than an equivalent amount of carbon dioxide (CO2). SF_6 is also a very stable chemical, with an atmospheric lifetime of 3,200 years.
[14]SF_6 emissions are converted to CO_2e.

(1) annually, rather than monthly; or (2) to coincide with the original equipment manufacturer's recommended maintenance schedule for the SF_6-insulated switchgears. The commenter did not provide details of such a schedule. The commenter also did not make any claim that it cannot comply with Conditions IV.D.2.a.1. and a.2. in the draft permit as written.

The draft permit's BACT limit on tons of CO_2e on a 12-month rolling total basis, along with its monitoring method, is appropriate as BACT for SF_6 emission sources such as the SF_6-insulated switchgears, is practically enforceable, and is consistent with previous OCS air permitting.[15]

To the extent the comment requests a change to the method of verifying compliance and not a change to the emission limit itself, making such a calculation only once a year to verify compliance with a 12-month rolling average limit is not acceptable. It will not enable verification of compliance with the relevant 12-month rolling emission limit, which applies monthly. An air permit must designate a tool for verifying compliance with a BACT emission limit or a limit on an emission source's potential to emit that is consistent with the way the limit is expressed. With regards to the commenter's alternative suggestion that the permit allow compliance to be measured at an interval consistent with an undefined maintenance schedule recommended by an undefined manufacturer, we cannot tell at this time whether such a schedule would align with compliance demonstration at an adequate frequency, and we are not aware of provisions in the CAA or its implementing regulations supporting deference to an undefined manufacturer's recommendation as a permit's compliance methodology for a BACT limit of this type.

To the extent that the commenter in fact meant that the BACT CO_2e emission limit should be expressed as tons per year rather than as tons on a 12-month rolling total basis, EPA notes that such a limit is not acceptable as a BACT emission limit or a permit limit on an emission source since such a long averaging time would not readily allow for determination of compliance (i.e., one would have to wait for another year to pass to determine compliance again), thus making such a permit limit not practically enforceable as per EPA guidance.[16]

Based on the above rationale, no change to Condition IV.D.2.a.1. was made based on this comment.

Comment 7.6

Comment regarding the specific draft OCS air permit condition below:

IV.D.2.d: "perform maintenance on an SF_6-insulated electrical switchgear to fix seals as soon as practicable but no later than 5 days after the pressure drop is detected"

It is expected that dangerous weather conditions could prevent crews from conducting

[15] *See* OCS air permit issued by EPA for Empire Wind, *available at* https://www.epa.gov/system/files/documents/2024-02/final-permit.pdf.

[16] *See*, EPA, New Source Review Workshop Manual, at B.56 (Oct. 1990); *see also*, EPA's June 13, 1989 "Guidance on Limiting Potential to Emit in New Source Permitting", which can be found at https://www.epa.gov/sites/default/files/2015-07/documents/lmitpotl.pdf, and EPA's March 13, 1992 memorandum John B. Rasnic to David Kee entitled "Policy Determination on Limiting Potential to Emit for Koch Refining Company Clean Fuels Project," which can be found at https://www.epa.gov/sites/default/files/2015-07/documents/koch_ref.pdf.

maintenance for periods of up to 14 days. A requirement to fix equipment at the soonest weather-permitting accessible day or within 14 days after the pressure drop is detected would be more appropriate.

Response 7.6
Commenter requests that EPA provide an exception to the maximum time provided in the permit to fix leaks of SF_6 at SF_6-insulated electrical switchgears (switches and bus ducts) from 5 days to up to 14 days after the leak is detected, during dangerous weather-related events, arguing that the potential for dangerous conditions makes such a change appropriate.

In considering this request, EPA recognizes that dangerous weather-related events such as high winds, storms, fog, heavy seas, and extreme temperatures, to name a few, can create hazardous conditions for the safety of the maintenance crew. EPA does not want to encourage unsafe activities by this permit condition and also recognizes that during these dangerous weather-related events, keeping the supply of electricity flowing is the most critical. Therefore, EPA is extending the repairs from 5 days to up to 14 days from the initial detection of a leak during these exceptional weather-related events, but expects repairs to be timely conducted once the dangerous weather conditions subside. However, this change will not affect the existing maximum annual allowable SF_6 emission losses stipulated in the permit; EPA is leaving that permit limit unchanged. EPA is revising Condition IV.D.2.d as follows:

> *Upon a detectable pressure drop that is 10 percent of the original pressure (accounting for ambient air conditions) for any switch or SF_6 gas-insulated bus duct, perform maintenance on an SF_6-insulated electrical switchgear to fix seals as soon as practicable but no later than 5 days after the pressure drop is detected. If repair or replacement cannot occur within 5 days of the detected leak, then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed.* ***If repair or replacement cannot occur within 5 days of the detected leak because dangerous weather conditions prevent the repair within that period, then: 1) the Permittee shall fix seals at the soonest weather-permitting accessible day but no later than 14 days after the pressure drop is detected; and 2) if the repair cannot occur within 14 days of the detected leak then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed.*** *The Permittee shall document and maintain records of the equipment repaired or replaced, including but not limited to, the estimated time of leakage and volume of gas leaked during that time,* ***as well as records and documentation of any claim(s) that dangerous weather delayed repair or replacement****. [40 C.F.R. § 52.21]*

Comment 7.7
Comment regarding the specific draft OCS air permit condition below:

IV.G.1. and IV.I.1: Facility-Wide 12-Month Rolling and Daily Emission Limits for SO_2

As stated in the footnotes of Tables 6 and 7 of the Draft Permit, SO_2 emissions do not trigger PSD review. We do not believe it is necessary or appropriate to limit SO_2 emissions in the permit

beyond a requirement to remain under the PSD Significant Emission Rate (SER) of 40 tons per year. That said, 12-month rolling total emissions limits would be appropriate based on precedent from other OCS air permits.

It is our understanding that the daily and 12-month rolling SO_2 limits in the Draft OCS Air Permit were derived from the AQRV model inputs, but SO_2 was only included in AQRV modeling analyses for completeness, and it was expected that the minimal emissions would not significantly contribute to modeled AQRV impacts. To confirm our expectation, Atlantic Shores has re-run the prior CALPUFF visibility analyses assuming a 40 TPY annual SO_2 significant emission limit. This assumption results in modeled emission rate of 14.5 times the expected worst case emission rate. The results of the re-analyses with the assumed higher emission rates are presented below in the same table format for comparison to the original results (which are Tables 6 and 7 of the Class Air Quality Related Values Modeling Report submitted with the permit application), also provided below.

Reported in February 2024

Table 6. Visibility – Normal O&M Activities

Modeled Year	98th percentile 24-hour change in light extinction	Number of days with extinction change > 5%	Number of days with extinction change > 10%	98th percentile 24-hour delta-deciview	Number of days with delta-deciview > 0.5	Number of days with delta-deciview > 1.0
2018	1.5%	0	0	0.14	0	0
2019	1.1%	0	0	0.11	0	0
2020	1.8%	1	0	0.18	1	0

Table 7. Visibility – Normal O&M Activities Plus Major Turbine Repair Plus IAC Repair

Modeled Year	98th percentile 24-hour change in light extinction	Number of days with extinction change > 5%	Number of days with extinction change > 10%	98th percentile 24-hour delta-deciview	Number of days with delta-deciview > 0.5	Number of days with delta-deciview > 1.0
2018	3.5%	3	0	0.35	3	0
2019	3.1%	0	0	0.30	0	0
2020	4.5%	7	2	0.44	7	1

New results using July 2024 SO2 emissions (14.5 times higher than in February 2024 runs)

Table 6. Visibility – Normal O&M Activities

Modeled Year	98th percentile 24-hour change in light extinction	Number of days with extinction change > 5%	Number of days with extinction change > 10%	98th percentile 24-hour delta-deciview	Number of days with delta-deciview > 0.5	Number of days with delta-deciview > 1.0
2018	1.5%	0	0	0.15	0	0
2019	1.1%	0	0	0.11	0	0
2020	1.8%	1	0	0.18	1	0

Table 7. Visibility – Normal O&M Activities Plus Major Turbine Repair Plus IAC Repair

Modeled Year	98th percentile 24-hour change in light extinction	Number of days with extinction change > 5%	Number of days with extinction change > 10%	98th percentile 24-hour delta-deciview	Number of days with delta-deciview > 0.5	Number of days with delta-deciview > 1.0
2018	4.0%	4	0	0.39	3	0
2019	3.2%	1	0	0.32	0	0
2020	4.5%	7	2	0.45	7	2

These results confirm our expectation and conclusively demonstrate that SO_2 emissions, at expected actual worst case or at the much higher assumed emission rates, will not contribute significantly to modeled visibility impacts and are consistent with the conclusion in the submitted modeling report which states, on page 8 of the report:

"For normal O&M as well as normal O&M occurring simultaneously with major turbine repairs and Inter-Array Cable (IAC) repair, the 5% visibility extinction threshold for the 98th percentile is not exceeded for any of the 3 years (Table 6 and Table 7)."

It is our opinion that it is not necessary or appropriate to include short-term (tons/day) SO_2 limits, and we request their removal. If a short-term limit is determined to be necessary, we propose 0.11 tons/day as supported by the revised AQRV analysis.

Response 7.7

EPA is retaining a daily SO_2 limit in this permit. We consider it necessary and appropriate to keep this emission limit at this time because Atlantic Shores modeled SO_2 impacts, and the daily SO_2 limit is intended to ensure that the project is conducted in alignment with the submitted air quality analyses, including analyses related to the AQRVs that was submitted to US FWS, the Federal Land Manager for this project with whom EPA coordinates. The FLM has informed EPA that the revised visibility tables that the commenter submitted in this comment are insufficient to inform a technical recommendation on the commenter's request. Additional analysis may be required. *See* Response 7.12 for additional discussion.

The SO_2 ton per day limits in the permit were based on short-term emissions rates provided in Appendix B ("Model Inputs") to the Air Quality Dispersion Modeling Report. To establish these limits for the C&C phase, for each activity in the modeling for short-term NAAQS and increment (i.e., foundation installation, OSS installation, foundation scour protection, inter array cable installation, inter array cable pre-lay, inter-array cable scour protection, WTG installation,

and transit), the peak hour SO_2 emission rates (in grams per second) for each vessel/emission point modeled for that activity were summed together. Then, the summed grams per second value was converted to ton per day. Finally, the ton per day value for each activity in the construction modeling was added together. A similar process was repeated for the O&M phase.

EPA acknowledges the updated modeling performed with CALFUFF that was submitted during the public comment period. However, given the information before it, EPA believes Atlantic Shores is able to comply with the daily SO_2 emission limits included in the draft permit. As Atlantic Shores states in the "Additional Clarification" section of its comments document, "For all construction activities, short-term model input emission rates, in units of grams per second, were generated for the peak hour and assumed to run 24 hours per day for all short-term model runs, which is a conservative approach." The ton per day value is based on short-term modeling that used a conservative approach, and the actual construction activities are not expected to operate continuously for 24 hours per day. Thus, if Atlantic Shores operates below the peak emission rates provided in the application, it should be able to comply with the ton per day limit.

Furthermore, the daily SO_2 emission limits from the draft permit are not simply the ton per year limit divided by 365 days, but rather have an additional buffer built in to provide Atlantic Shores flexibility. For example, if the emission limit of 0.05 tons of SO_2 per day is multiplied by 365 days, it provides a value of 18.25 tons per year. 18.25 is approximately 4.45 times greater than the permit's 12 month rolling total SO_2 emission limit of 4.1 tons. Also, please *see* Response 7.12.

We note that the alternative SO_2 limit of 0.11 ton of SO_2 per day suggested by the commenter would be equivalent to a potential to emit of 40.15 tons/year, triggering PSD review for SO_2. Such a change would thus not be appropriate at this time, and we do not have sufficient information to process any other alternative increase from the draft permit's limit of 0.05 ton of SO_2 per day. Consequently, we have decided to maintain the original limit of 0.05 ton per day in the permit. However, this does not prevent the Permittee from revisiting this issue in the future as a permit modification with the submittal of additional air modeling analysis and/or other potential mitigation measures, if required.

Comment 7.8

Comment regarding the specific draft OCS air permit condition below:

V.2: "For each marine engine of any jack-up vessel that is an OCS source, the Permittee shall conduct a one-minute visible emissions survey of the engine's emission points, each day during C&C and O&M that the engine operates."

Atlantic Shores proposes that "the Permittee shall conduct a one-minute visible emissions survey of the engine's emission points, weekly during C&C and O&M that the engine operates."

Response 7.8

Condition V.2 of the draft permit requires the Permittee to use EPA Method 22[17] to conduct a one-minute visible emissions survey of the emission point(s) for each marine engine on the 3

[17]EPA Method 22 is a qualitative technique that checks only the presence or absence of visible emissions.

OCS source vessels used at different times during C&C and the 4 OCS source vessels used at different times during O&M, for each day that the marine engine operates. Condition V.2 also requires that (a) if visible emissions from an emissions point are observed, the Permittee initiate corrective action within 8 hours of the observation, and (b) if the visible emissions persist following corrective action, the permit requires that the Permittee perform an EPA Method 9 visual determination of opacity in accordance with 40 C.F.R. Part 60, Appendix F, within 24 hours of the initial observation. The draft permit's requirements for daily visible emissions tests are in line with other OCS air permits previously issued by EPA for other wind farm projects, which have also required daily visible emissions tests for marine engines of OCS source vessels.[18]

The commenter proposes that these visible emissions surveys be conducted weekly when relevant marine engines are used during the C&C and O&M phases, as opposed to each day the marine engine operates. The commenter requests this change without further support or explanation for the request.

The daily visible emissions surveys required by the permit play an important role in assessing and assuring compliance with the opacity limits. Visible emissions surveys are quick to perform, are used to determine if visible emissions are present that must be addressed, and are part of the process for determining if formal observations must be conducted using EPA Method 9. Conducting these surveys daily will make the Permittee immediately aware of the presence of visible emissions, and the Permittee can then assess the situation and take measures to correct the issue causing the occurrence of visible emissions. In this way, daily surveys are monitoring measures meant to prevent and minimize the amount of air pollution released into the atmosphere by the marine engines on the OCS source vessels. If the visible emissions survey were to be conducted weekly instead of each day the marine engine operates, it would take longer for the Permittee to become aware of the presence of visible emissions, delaying any corrective actions and, during that time, the opacity limit might be exceeded.

EPA also notes that opacity is often an indicator of a level of particulate matter ("PM") emissions. Each of the marine engines of the OCS source vessels that are subject to the visible emissions survey requirement is also subject to BACT PM emission limits.

EPA has considered the comment but has determined that the requested change is unwarranted.

Comment 7.9

Comment regarding the specific draft OCS air permit condition below:

V.2.a: "For emission points where visible emissions are observed, the Permittee shall initiate corrective action within no more than eight hours of the initial observation."

Atlantic Shores proposes that "the Permittee shall initiate corrective action within no more than 24 hours of the initial observation," which is reasonable to give morning crews enough time to

[18] *See* OCS air permits issued by EPA for South Fork, Revolution Wind, Sunrise, New England 1 and New England 2, which can be found at https://www.epa.gov/caa-permitting/epa-issued-caa-permits-region-1, and the OCS air permit issued by EPA for Empire Wind, which can be found at https://www.epa.gov/system/files/documents/2024-02/final-permit.pdf.

evaluate the situation and determine what corrective action is needed.

Response 7.9

EPA has considered this comment and has updated Condition V.2.a. as indicated below. We acknowledge the challenges of implementing a corrective action at nighttime when the initial visible emissions observation occurred close to the waning daylight hours. We are thus granting the commenter's request that corrective action be initiated within no more than 24 hours of the initial observation, instead of 8 hours, but only if the ability to initiate and complete a corrective action within 8 hours is compromised by the inability to complete the repairs within the remaining daylight hours of that day. We believe that the updated condition addresses the commenter's concerns, while ensuring an adequate monitoring requirement.

> *For emission points where visible emissions are observed, the Permittee shall initiate corrective action within no more than eight hours of the initial observation,* ***or within no more than 24 hours of the initial observation if limited remaining daylight hours prevent faster action.***

Comment 7.10

Comment regarding the specific draft OCS air permit condition below:

> **IX.A.1:** "The Permittee shall comply with the following for each of the permanent diesel generator engines on the OSSs during O&M. Each permanent diesel generator engine shall: [40 C.F.R. § 52.21, 40 C.F.R. § 55.6(a)(4)] a. Have a maximum engine power of less than or equal to 500 kW. b. Each engine shall be equipped with a non-resettable hour meter. c. Each engine shall not exceed 500 hours of operation on a 12-month rolling total basis."

Atlantic Shores proposes that this condition include language such that diesel generator engines larger than 500 kW could be used if the total emissions associated with all permanent diesel generator engines is the same or lower than using the number of 500 kW engines included in the application PDE. Similar language has been applied to vessel engine emission standards in the OCS Air Permits of Coastal Virginia Offshore Wind, Sunrise Wind, Revolution Wind, Vineyard Wind I, South Fork Wind, and New England Wind I.

Response 7.10

The permit condition identified by this commenter refers to the permanent diesel generators engines (up to a maximum of eight) to be located on the offshore substations during the O&M phase. Atlantic Shores stated in its application that these generators would be 500 kW or less, and the application was evaluated on that basis. In addition to the condition identified by the commenter, these engines are also subject to other permit conditions such as Section IV.B of the permit's NSPS IIII requirements, BACT and LAER emission limits, and New Jersey particle emission standard requirements under N.J.A.C. 7:27-4.2, which contain per-hour emission limits. These requirements apply to each specific engine (or stack) individually, not the sum of the emissions across all the engines. And, the size (in kW) of the actual engines chosen impacts the regulatory requirements and emission standards applicable to these engines. If larger engines need to be installed, the proper procedure is to request a permit modification.

The commenter fails to identify any condition in an OCS air permit for another wind farm that is similar to the condition it proposes.

Comment 7.11
Commenter provides the below miscellaneous editorial notes on the draft OCS air permit:

a) Please edit the signature page to read "construct and operate *two* offshore wind farm project*s* located on the OCS…"

b) Please edit the Project Description to read "proposes to construct (install) and operate *two offshore wind farm projects totaling* approximately *2,840* megawatt ("MW") in the designated Renewable Energy Lease Area OCS-A 0499."

c) In Condition IV.A.1.B, "OCS major repair" should read "OSS major repair."

d) In Condition IV.A.5., the letters denoting individual conditions are nonsequential.

e) Please edit Condition IV.B.2.e. to read "If an event requires the removal of a switchgear, the *damaged* major components will be replaced with new components *or repaired in accordance with OEM recommended procedures*.

f) In Condition IV.H.1.b.1, the correct Program Interest number is PI 5583*4*.

g) In Condition IV.I, the numbers denoting individual conditions are nonsequential.

Response 7.11
a) EPA notes that although this permit is being issued for two offshore wind farms, a single permit application was submitted for both and they are treated as a single OCS source (the OCS Facility) for purposes of this permit. EPA is revising the language referenced to read as follows:

> *Atlantic Shores Offshore Wind Project 1, LLC is hereby authorized to construct and operate ~~the~~ **two** offshore wind farm**s** ~~project~~ located on the OCS within the lease area OCS-A 0499, about 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. The construction and operation of the **two** wind farm**s** shall be subject to the attached permit conditions and permit limitations.*

b) EPA has no objection to clarifying that this permit covers a single OCS source (the OCS Facility) consisting of two wind farms, or clarifying the total MWs of the two wind farms. We note that page 336 of Atlantic Shores' June 26, 2024, OCS application states that Project 1's capacity is 1,510 MW and Project 2's new target capacity is 1,327 MW, which provides a total target capacity of 2,837 MW. This change does not affect any of the existing terms and conditions of the OCS air permit because the modeling and other analyses in the application already take into account the emissions associated with constructing and operating turbines totaling 2,837 MW capacity.

Therefore, within the Project Description, EPA is revising the following two sentences as follows:

> *Atlantic Shores Offshore Wind Project 1, LLC ("Atlantic Shores" or "Permittee"), along with its affiliate, Atlantic Shores Offshore Wind Project 2, LLC ("Atlantic Shores Project 2 Company"), proposes to construct (install) and operate* ***two offshore wind farms*** *~~projects~~* ***totaling*** *~~an~~ approximately* ***2,840*** *~~2,470~~ megawatt**s** ("MW") ~~offshore wind farms project~~ in the designated Renewable Energy Lease Area OCS-A 0499 awarded by BOEM.*
>
> *Atlantic Shores and its affiliate, Atlantic Shores Project 2 Company, propose to develop the OCS lease area into two wind farms, known as Atlantic Shores Project 1 ("ASP1") (1,510 MW) and Atlantic Shores Project 2 ("ASP2") (**target capacity of 1,327** ~~960~~ MW), collectively referred to as the OCS Facility.*

c) EPA is correcting this typographical error.
d) EPA is correcting this typographical error.

e) EPA assumes the comment refers to Condition IV.D.2.e. EPA agrees with the proposed revisions to clarify that Condition IV.D.2.e. allows for the possibility of repairing the damaged switchgear component, if it can be done in accordance with the original equipment manufacturer's recommended procedures. In addition, EPA is further revising this condition as a result of Comment 1.3.

Condition IV.D.2.e. is revised as follows:

> *If an event requires the removal of a switchgear, the ~~affected~~* ***damaged*** *major components will be replaced with new components* ***or repaired in accordance with the original equipment manufacturer's recommended procedures.*** *For purposes of this requirement, an event means when any component of a switchgear is damaged and results in SF_6 leakage that cannot be repaired on site.* ***The Permittee shall consider the technical and economic viability of installing SF_6-free switchgears whenever an SF_6-containing switchgear needs to be replaced with a new one and install the SF_6-free switchgear, if deemed technically feasible. The Permittee shall keep a record of this decision and its basis for each replaced switchgear.***

f) EPA is correcting this typographical error.
g) EPA is correcting this typographical error.

Comment 7.12
Clarifications to the Fact Sheet

Page 15 of 67: Per above, we note that the SO_2 emissions do not contribute meaningfully to modeled AQRV impacts.

Response 7.12
The US FWS provided the following response to the comment above:

> *The U.S. Fish & Wildlife Service (FWS) does not support increasing sulfur emission limits to the Prevention of Significant Deterioration (PSD) trigger level for the Atlantic Shores – South, Wind Energy air quality permit.*
>
> *Utilizing federal FLAG 2010 guidance, FWS routinely asks that all impairing emission increases be included during air quality PSD permit review. This ensures that all potential impacts to Class I areas are evaluated together. Each pollution species has a unique influence on Air Quality Related Values (AQRV) yet combines to produce a comprehensive impact to the Wilderness.*
>
> *Increases to SO_2 emissions affect visibility in both the near- and far-field and varies considerably during the life of the project. Sulfur deposition also contributes to acidification of soils, coastal marsh, and requires additional evaluation.*
>
> *The revised visibility tables included with the comment letter are insufficient to inform our review. The FWS would consider the request to increase SO_2 emissions to 40 tons per year a significant change to the application requiring renotification.*

Section 8.0 – Decommissioning Issues

Comment 8.1
These wind farm projects are unsustainable, unreliable, destructive and unaffordable with no decommissioning plan in place.

Response 8.1
The current OCS air permit does not authorize any decommissioning/dismantling of the project. Decommissioning activities, which differ substantially from construction and operation activities, are addressed through a process separate from the lease issuance process under the Department of Interior's regulations. *See* 30 C.F.R. Part 585, Subpart E ("Lease and Grant Administration") and Part 285, Subpart I ("Decommissioning"). The decommissioning plan will be developed and implemented at the end of the operational life of the project, which has an expected 30-year life span, at which time regulatory requirements may have changed and/or new technologies and equipment may be available. Potential air emissions will then be assessed and the applicability of regulatory requirements in effect at that time will be determined, including the requirements of any needed OCS air permit. Also *see* Response 8.3 regarding the current Conceptual Decommissioning Plan in BOEM's ROD.

Comment 8.2
Just one of the environmentally degrading and irreversible effects of the Atlantic Shores Offshore Wind Projects entails the fact that there is an entirely insufficient decommissioning plan, which will encourage debris, refuse, and immovable towers, never to be removed from the pristine ocean floor. As such, future generations will be left with the vast and inestimable cost of dealing with the impossible cleanup efforts. Our environment, recreational and commercial

fishing industry, and our precious ocean would never recover from these entirely unnecessary and outrageous actions.

Response 8.2
No specific analysis was identified or submitted to substantiate the statements made in the comment. For additional information on the timing of the decommissioning plan, *see* Response 8.1. The current Conceptual Decommissioning Plan is also discussed in page 86 of 560 of BOEM's FEIS, *see* Response 8.3. *See* Response 4.4 for a link to the FEIS.

Comment 8.3
The Industrial Offshore Wind Project fails to include any ongoing funding for the ultimate removal/decommissioning and/or replacement of the turbines, which means at the end of their useful life the companies could decline to remove them and either go out of business or file for bankruptcy. The State's residents, therefore, will likely be forced to either live with over 200 decaying Eiffel Towers in their ocean off their Shore or pay the costs associated with removing them.

Response 8.3
This comment is outside the scope of this OCS air permitting action under the Clean Air Act. However, the Conceptual Decommissioning Plan in page 86 of 560 of BOEM's FEIS states:

> *If the COP[Construction and Operations Plan] is approved or approved with modifications, Atlantic Shores would have to submit financial assurance (e.g., a bond) prior to installation that would be held by the U.S. government to cover the cost of decommissioning the entire facility in the event that Atlantic Shores would not be able to decommission the facility, as outlined under 30 CFR Part 585 Subpart E.*

See Response 4.4 for a link to the FEIS.

Comment 8.4
Commenter asks what the long-term plan for the turbines is if the project comes to fruition when they are at the end of their lifespan. Will they just be another man-made thing polluting the ocean?

Response 8.4
At the end of the project's operational lifespan, anticipated to be 30 years, there will be a decommissioning phase to remove structures from the Outer Continental Shelf (OCS). As best available control technologies are expected to change throughout the lifespan of the project, the current OCS permit does not authorize actions for the decommissioning phase. *See* Response 8.1 for additional discussion.

Comment 8.5
Most proposed offshore wind projects are structured as limited liability single purpose entities, with the only assets of the company being the turbines, undersea cables, and related equipment. If the company decides to discontinue the project, the company can simply declare bankruptcy with the burden of the costs of decommissioning the turbines falling on the taxpayers and the

electricity consumers.

Response 8.5
This comment falls outside the scope of this permitting action, *see* Response 8.3.

Comment 8.6
During decommissioning, equipment and vessels will be needed to deconstruct and transport project components and return the offshore lease area to its preexisting state. This will involve discharging air pollutants, as well as disposing of the spent air pollutants used in the turbines and associated infrastructure. However, the only reference the draft permit makes to decommissioning is that it "does not authorize the permittee to commence any such decommissioning activities, which may be subject to a separate preconstruction review process." The use of 'may' is troubling, because a preconstruction review process will certainly be required to analyze the environmental impacts of decommissioning activities.

The draft air permit should include a contingency plan in the event that decommissioning activities will use currently available technology. Of course, if emissions control technologies for marine vessels do improve, Atlantic Shores should be required to implement them, so the contingency plan should only become effective if there are no better (i.e., less environmentally impactful) technologies available.

The proposed approach to decommissioning does not make logical sense when the same requirements would be applicable to Projects 1 and 2 for construction as well as operations and maintenance, both of which could take multiple years—three decades, in the case of operations and maintenance. In order to properly allow for technological development, the permit must be reevaluated every five years, like New Jersey's operating certificates and general permits are.

Response 8.6
EPA is issuing an OCS air permit to Atlantic Shores to construct and operate the OCS source described in the submitted permit application. This application does not describe proposed decommissioning activities in sufficient detail for EPA to establish appropriate terms and conditions applicable during the decommissioning phase. This is to be expected given a detailed decommissioning plan typically is not developed until close to the end of the project life. Moreover, offshore vessel technology is currently changing and is expected to continue to change into the future. It would not be appropriate for EPA to issue an OCS air permit containing terms and conditions applicable to unspecified decommissioning activities that may not occur for thirty years. Upon receipt from the permittee of all information pertaining to decommissioning activities necessary for EPA to determine the applicable CAA requirements, EPA will evaluate the proposed activities and determine whether a new or revised OCS air permit is required to authorize such activities.

To the extent the commenter seeks regular review of the permit covering the C&C and O&M phases of this project, the OCS air permit already incorporates onshore Clean Air Act and state/local requirements that are incorporated by reference into 40 C.F.R. Part 55 and are thus applicable to this project. Under the New Source Review program, PSD and NNSR permits are issued prior to construction and are not reevaluated on a periodic basis. However, although the

applicant is not applying for a Clean Air Act Title V (operating) permit at this time, it is required to submit an initial Title V operating permit application within twelve months of the new facility's commencement of operations. The applicant must apply to renew the operating permit every 5 years.

Comment 8.7
Commenter states that there are no plans for maintaining and dismantling these horrific monsters.

Response 8.7
With respect to maintenance, EPA has reviewed the applicant's plans to conduct maintenance of the wind farm infrastructure and its associated maximum air emissions for compliance with Clean Air Act requirements. The OCS air permit contains many requirements applicable during the project's O&M phase which apply to maintenance of the wind farm. These permit requirements include provisions such as emission limits and other requirements applicable to the specific OCS source vessels that would be used to conduct maintenance, as well as maximum daily and annual emissions limits for the OCS Facility as a whole during the O&M phase.

With respect to dismantling, as discussed in the Fact Sheet that accompanied the OCS Draft Permit, the dismantling of the wind farm may require a new OCS air permit around the end of the project's lifespan, which is projected to be around 30 years. *See* Response 8.3 for additional discussion of decommissioning.

Section 9.0 – Project Segmentation

Comment 9.1
Atlantic Shores South is currently seeking a segregation of Lease Area OSC-A 0499 so that Project 1, LLC and Project 2, LLC will own their own separate leases for their respective projects. According to Atlantic Shores, "At a later date, when necessary, Project Company 1 and Project Company 2 will undertake any necessary permit transfers, amendments, and/or application requests to ensure that Project Company 2 is subject to all required terms and conditions under the CAA to conduct the activities approved in its respective COP for its new commercial lease area". For now, according to EPA, "Project Company 1 is the appropriate new owner given that its Project is the first one to be developed in Lease Area OCS-A 0499, with Project 2 anticipated to occur thereafter in a staggered manner."

Commenter questions the need and purpose for such segmentation and the resulting delegation of responsibilities under the air permit, especially since the Assignment and Assumption Agreement between Atlantic Shores Offshore Wind, LLC; Atlantic Shores Project 1, LLC; and Atlantic Shores Project 2, LLC was not included in the docket with the letter requesting a change in ownership.

Response 9.1
In its letter requesting that Atlantic Shores Project 1, LLC take over the OCS air permit application (Ownership Transfer Request Letter), Atlantic Shores Offshore Wind LLC explained that Atlantic Shores and its Project Companies have requested from Bureau of Ocean Energy

Management a lease segregation whereby Atlantic Shores Offshore Wind Project 1, LLC (Project Company 1) will retain a portion of Lease OCS-A 0499 and Atlantic Shores Offshore Wind Project 2, LLC (Project Company 2) will acquire a new lease consisting of the remaining portion of Lease OCS-A 0499. The letter was accompanied by an Assignment and Assumption Agreement between Atlantic Shores Offshore Wind, LLC, Project Company 1, and Project Company 2, which has now been added to the docket for this action in Regulations.gov. In light of the pending lease segregation and prior designation of the Project Companies as the leaseholders, Atlantic Shores Offshore Wind LLC requested a transfer of ownership of the OCS air permit it was seeking for this project to Project Company 1. EPA notes that the quote the commenter attributes to EPA was taken from the Ownership Transfer Request Letter.

Atlantic Shores stated in its letter that at a later date, when necessary, Project Company 1 and Project Company 2 will undertake any necessary permit transfers, amendments, and/or application requests to ensure that Project Company 2 is subject to all required terms and conditions under the CAA to conduct the activities approved in its respective Construction and Operations Plan (COP) for its new commercial lease area. Atlantic Shores has also stated that Atlantic Shores and the Project Companies will ensure that BOEM's current decision-making process is coordinated with this request in terms of timing and reference to this change in ownership is included in any applicable decision documents.

Such a division of the project covered by this permit into two separate permits is not before the EPA at this time. If Atlantic Shores completes its lease segregation with BOEM and submits to the EPA an OCS air permit application or applications to divide the permit between Project 1 and Project 2, the details of the segmentation and any resulting delegation of responsibilities under the OCS air permit raised by the commenter would be considered and addressed as part of that future permitting action.

Section 10.0 – Miscellaneous Issues

Comment 10.1
Alternative Sites, Sizes and Processes.

The application states in Section 3.9.3 that per New Jersey Annotated Code 7.27–18.3(c)2 an analysis of alternative sites within New Jersey and of alternative sizes, production processes, including pollution prevention measures, and environmental control techniques, demonstrating that the benefits of the newly constructed, reconstructed or modified equipment significantly outweigh the environmental and social costs imposed as a result of the location, construction reconstruction, or modification and operation of such equipment.

Notwithstanding the discussion following that paragraph no such alternative analysis for the proposed project has been conducted.

The process by which the New Jersey wind energy area was identified did not include any analysis of alternative sites or energy production options within New Jersey. It only considered limited offshore renewable energy areas that were circumscribed by the charge to the NJ Renewable Energy Task Force that conducted the site area selection process.

The process of awarding subsidies to the wind energy projects by the NJ Board of Public utilities under the Offshore Wind Economic Development Act at no point considered alternative energy sources within New Jersey.

Finally, at no point in the BOEM National Environmental Policy Act review process has analysis of alternative energy sites or energy production processes within NJ been included in any environmental assessments or impact statements, nor for that matter any alternative offshore areas other than the Task Force selected area.

Therefore, this section of the New Jersey Code has not been complied with.

Response 10.1
The applicant fulfilled its N.J.A.C. 7:27-18.3(c)(2) requirement to conduct an alternative site analysis in Section 3.9.3 of the revised application. The size and scope of this type of wind farm project can only be approved and constructed on federally approved lease areas in the ocean through a Wind Energy Commercial Leasing Process which is managed by the Department of Interior's Bureau of Ocean Energy Management. BOEM is responsible for implementing the federal regulations developed for the Outer Continental Shelf Renewable Energy Program. These regulations provide a framework for issuing leases, easements and rights-of-way for OCS activities that support production and transmission of renewable energy, including offshore wind, ocean wave energy, and ocean current energy. BOEM has gone through an extensive consideration of offshore sites before issuing its offshore wind development leases. And, BOEM has issued an FEIS for the Atlantic Shores Project that considered 21 project alternatives at this specific lease site. The commenter's request that the applicant provide an additional analysis of alternative sites or energy production processes within onshore New Jersey cannot be conducted as envisioned by the commenter, since construction of this type of project, with its proposed size and scope, is not technically and regulatorily feasible within the land occupied by the state of New Jersey. Alternatively, the commenter may be arguing that an alternative site analysis could have been performed within a different BOEM lease area in the ocean. However, those leases area are all already leased to other entities and a separate review will eventually be conducted for each project site.

See also Response 4.48 regarding BOEM's consideration of 21 alternatives to this project in the Final Environmental Impact Statement (FEIS) and its conclusion in the ROD.

Comment 10.2
Measurement and Enforcement
40 CFR § 55.9 Enforcement states that Outer Continental Shelf (OCS) sources must comply with all requirements of 40 CFR Part 55 and all permits issued under it. Failure to do so is considered a violation of section 111(e) of the Act. All enforcement provisions of the Clean Air Act (CAA), including sections 113, 114, 120, 303, and 304, also apply to OCS sources and permittees.

Given the importance and uniqueness of the Brigantine National Wilderness Area (BWA), any air permit should include requirements for measurements of air pollutant concentrations at the BWA coincident with periods of offshore wind project construction. It should also have provisions to order cessation of construction activities should those measurements exceed predicted concentrations.

Response 10.2
It should be noted that EPA maintains its enforcement authorities under the Clean Air Act regardless of whether they are listed in the permit.

EPA does not see a need to include additional ambient monitors at the Brigantine National Wilderness Area (BWA) beyond those that are already in place. First, there are a number of air monitors already present in the area of the BWA. Current monitors at the Brigantine National Wilderness Area include the Interagency Monitoring of PROtected Visual Environments (IMPROVE) program monitor, which monitors visibility, and the National Atmospheric Deposition Program (NADP) program monitor, which monitors the wet deposition of sulfur, nitrogen, and mercury. The New Jersey State Department of Environmental Protection also operates a site which monitors ozone (O_3), SO_2, and $PM_{2.5}$ concentrations.

Second, at such a distance from the wind farm lease area, we could not determine which portion of the concentration detected by any ambient air monitor at the BWA came from the project. Even if accurate meteorological data from the relevant time was available, it would be extremely difficult to attribute monitored values at the BWA to the construction activities of the project with reliable accuracy. Other sources of pollution, such as vessels unrelated to the project or onshore combustion sources, could be located upwind of the BWA and contributing to any measured exceedance. There would also be a time lag between a monitored value and any evaluation, however inaccurate, that could be conducted to try to determine sources contributing to that value.

However, the permit contains measures to ensure protection of the Brigantine National Wilderness Area, including through measures such as maximum daily emission limits developed based on air quality analyses, and monitoring measures to ensure compliance with these limits, among many others. Construction emissions from all sources and for all activities were modeled continuously (24 hours per day and 365 days per year, for 8760 hours per year or 8784 hours per year in a leap year) using meteorological data for the 3-year period between 2018-2020. To model compliance with short-term NAAQS and increment, the emission sources were placed in the northwest corner of the lease area, closest to the coastline of New Jersey and the BWA, where they were modeled continuously for 3 years; modeling for compliance with annual NAAQS and increment placed a worst-case number of WTGs and OSSs to be constructed in one year in their actual expected locations, and chose WTG locations closest to shore. This was meant to capture all meteorological conditions to ensure the highest impacts were modeled and the standards were protected. *See* Responses 5.1, 5.2, 5.8, 5.12, and 5.13 for further discussions of modeling analyses conducted to demonstrate compliance with the NAAQS and PSD increment standards. The air quality analyses demonstrated that emissions in either phase (C&C or O&M) will not cause or contribute to any violations of the NAAQS or PSD Class I Increment at the BWA.

Comment 10.3
Liability

The Atlantic Shores projects 1 and 2 have taken ownership of the air permit from its corporate sponsors, EDF Renewables and Shell New Energy. It is not clear that the project itself has sufficient financial resources or backing to pay for the environmental damages that might occur

at the Brigantine National Wilderness Area (BWA) from its activities. It should be stated whether the Atlantic Shores projects themselves have such resources, or liability coverage in the form of insurance policies, surety bonds, letters of credit or other mechanisms.
This should be confirmed before any permit approval, and provisions for that included in any permit.

Response 10.3
This comment is outside the scope of this OCS air permitting action under the Clean Air Act. For the wind farm's impacts on the Brigantine National Wilderness Area, *see* comments in Sections 5.0 and 6.0. For issues related to setting aside funding for decommissioning purposes, *see* Response 8.3.

Comment 10.4
Notice of Intent.

According to 40 CFR § 55.4, a Notice of Intent (NOI) must be submitted to the United States Environmental Protection Agency (EPA) Regional Office for new or modified Outer Continental Shelf (OCS) sources. The NOI must also be sent to the air pollution control agencies of the Nearest Onshore Area (NOA) and any onshore areas next to the NOA. 40 CFR 55.4 only applies to sources located within 25 miles of a state's seaward boundaries.

It is not clear whether such notice was provided for the segmented project of this application.

It is also not clear why the application, once it was deemed complete on 8/21/2023 was not opened for public comment as required.

These should be explained.

Response 10.4
On December 22, 2021, EPA Region 2 received a Notice of Intent (NOI) for the Atlantic Shores project covered by today's permit. A copy of the NOI was also sent to the air pollution control agencies of the Nearest Onshore Area (NOA) and onshore areas adjacent to the NOA: New Jersey, New York, Pennsylvania, and Delaware. Please see item No. 3.1 of the docket at https://www.regulations.gov/docket/EPA-R02-OAR-2024-0312/document.

An NOI is only required for OCS sources located within 25 nm from states' seaward boundaries, prior to performing any physical change or change in the method of operation that results in an increase in emissions. *See* 40 C.F.R. § 55.4. The project covered by this permit – the construction of two wind farms on Renewable Energy Lease Area OCS-A 0499 – has not been segmented at this time. As of now, the OCS permit has only undergone a transfer of ownership. An NOI was not required for a transfer of ownership since it did not meet any of the criteria required for the submission of an NOI; the transfer of ownership did not involve a physical change or change in method of operation, and the ownership change did not result in an increase in emissions. An NOI will be required for a request to segment the project if the request meets the criteria for submitting an NOI.

Under 40 C.F.R. § 124.10, the Regional Administrator, the State director or the Tribal director as the context requires, or an authorized representative, shall give public notice that certain listed actions have occurred. One of those listed actions is that a draft permit has been prepared under 40 C.F.R. § 124.6(d). Finding a submitted permit application complete is not one of the listed actions, and EPA is not aware of any other regulatory requirement for a public comment period when an application is deemed complete. For a copy of 40 C.F.R. § 124.10, *see* https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-124/subpart-A/section-124.10.

The draft permit and required fact sheet were prepared and available for review on July 12, 2024. The public comment period started on July 12, 2024, and ran until August 16, 2024, with a virtual public hearing held on August 12, 2024.

Comment 10.5
Coastal Zone Management Act Consistency

The federal Coastal Zone Management Act (CZMA) was enacted by the United States Congress in 1972 (16 §§U.S. Code 1451-1464) and is intended to protect coastal resources with an established goal to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

The conclusions reached in Appendix F regarding consistency of the project with the State's CZMA rules rely in many cases only on certain biased sources of information and are flawed. There are numerous provisions of the State's CZMA rules that are violated by this project. Some examples are provided below.

This project starting 9 miles offshore, with 1046 foot high turbines, closer than any other modern project in the entire world, clearly cannot comply with the visual resource protection provisions of Section 7.7-1.1(e)-1.i of the NJ CZMA rules. This is confirmed by simple geometry, and by the renditions in the EIS and the COP, which even depicting fewer turbines than will actually be seen, show that they are clearly visible from the shore even under overcast conditions.

The attempts by the agencies to dismiss this based on what was called the Rutgers Meteorological study are disingenuous. That study was of an undefined smaller object on land mostly around the Atlantic City airport. Meetings with Rutgers staff confirmed that those frequencies of visibility have nothing to do with the viewing of a 1046-foot high wind turbine off the open ocean.

The project clearly cannot comply with the 200 tourism job loss criteria of CZMA rule Section 7.7-15.4(c). Based on several public response survey studies, including the University of Delaware study sponsored by the BOEM, the tourism job losses will be in the thousands. Similarly, the project cannot comply with the net job gain criteria in any given year. The job gain from the project in the operational years will be less than 100 whereas the tourism jobs are in the thousands and will persist.

There are many other examples where the project cannot reasonably comply with the NJ CZMA criteria, those will be provided in another forum.

Response 10.5
As discussed in the Fact Sheet that accompanied the draft permit for this project, Atlantic Shores prepared a Consistency Certification to demonstrate that the proposed project located within BOEM Lease Area OCS-A 0499 is consistent with the policies identified as enforceable by N.J.A.C. 7:7, and most recently submitted to BOEM an updated certification of consistency with the New Jersey Coastal Management Program in May 2024. And, NJDEP has determined that the proposed activity will be conducted in a manner consistent with New Jersey's Coastal Zone Management Plan and pursuant to 15 C.F.R. Part 930, which authorizes states with approved Coastal Zone Management programs to conduct a coastal zone consistency review and concurrence determination of projects within or outside the state coastal zone boundary. *See* the Fact Sheet for additional discussion.

See Response 4.25 and 4.51 for concerns about visibility. *See* Response 4.39 for concerns about tourism.

Comment 10.6
Commenter provides a notice of its intent to sue the EPA and Atlantic Shores Offshore Wind LLC pursuant to 42 U.S.C. § 7604(a)(1) of the Clean Air Act. The commenter states that this Notice of Intent to Sue and its attachment provide the requisite information stipulated by 40 C.F.R. 54.3(b). When EPA approves Atlantic Shores' Clean Air Act permit, OCS-EPA-R2 NJ 02, such approval will be arbitrary and capricious because Atlantic Shores pile driving related emissions will contravene the Class I Area $PM_{2.5}$ 24-hour standard for the Brigantine Wilderness Area in NJ.

Response 10.6
For discussion regarding this project's impacts on the Class I Area $PM_{2.5}$ 24-hour standard for the Brigantine National Wilderness Area and other discussion regarding the air quality and the Class I area, *see* Sections 5.0 and 6.0.

Regarding challenges to a final permit, EPA's final permit decision may be appealed administratively within 30 days of service of notice of the final determination. The procedures for administrative review are provided at 40 C.F.R. § 124.19 ("Appeal of RCRA, UIC, NPDES and PSD Permits"). Judicial review of a final permit action is available in the United States Court of Appeals within 60 days from the date on which this final permit action appears in the Federal Register. A petition for administrative review is a prerequisite to seeking judicial review of a final permitting action. For more information *see* 40 C.F.R. Part 124, a copy of which is available at https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-124. Submitting a "60-day Notice of Intent to Sue" is not a prerequisite to judicial review of a permit issued pursuant to 40 C.F.R. Part 124.

Comment 10.7
I respectfully request that EPA consider the lack of adequate notice posed by the incomplete Project application submitted by Atlantic Shores, resulting loss of due process, inadequate mitigation in the PEIS [Programmatic Environmental Impact Statement] as written, and other violations of NEPA, 40 CFR Part 55 and EPA's own policies and procedures, and take all action necessary to prevent any adverse outcomes. A No Action Decision is requested.

Response 10.7
EPA found the Atlantic Shores project OCS air permit application complete on August 21, 2023. Additional information was provided to the EPA following that date to supplement the application, and EPA reviewed that information in its development of the draft permit. The final permit application and other supplemental materials were provided in the docket for the draft permit on Regulations.gov (docket number EPA-R02-OAR-2024-0312) for the public to review when the public comment period for the draft permit opened on July 12, 2024.

In a BOEM memorandum entitled "Compliance Review of the Construction and Operations Plan for the Atlantic Shores Offshore Wind South Projects for Commercial Lease OCS-A 0499" that is attached to the ROD and available on page 173 of 208 of the ROD, BOEM states:

> *BOEM conducted its analysis under the National Environmental Policy Act (NEPA) in its final EIS to assess the reasonably foreseeable impacts on the physical, biological, socioeconomic, and cultural resources that could result from the construction and installation (construction), operation and maintenance (operations), and conceptual decommissioning (decommissioning) of the Project.*

See Response 4.1 for a link to the ROD. Issuance of OCS Air Permits requires compliance with 40 C.F.R. Part 55. As no specific grievances were stated regarding NEPA, 40 C.F.R. Part 55, or EPA policy and procedures, EPA cannot specifically respond to the comment.

Finally, as a clarification, the Atlantic Shores project is subject to an Environmental Impact Statement under NEPA. The PEIS mentioned by the commenter refers to the New York Bight PEIS, a draft of which was issued by BOEM on Jan. 8, 2024, following the execution of the six NY Bight leases. The final PEIS will be completed prior to COP submissions for the six covered leases, and will describes the potential environmental and social impacts resulting from development of the six New York Bight leases.

Comment 10.8
Each large offshore substation (OSS) can use up to 20,000 gallons of diesel fuel, 185,000 gallons of mineral oil, 400 gallons of sulfuric acid (batteries), 3,050 gallons of water/ethylene glycol, 54 gallons of AFFF-Firefighters aid, 794 pounds of refrigerant, 15 gallons of lubricant.

Response 10.8
The use of mineral oil, sulfuric acid in batteries, water, ethylene glycol, AFFF-Firefighters aid, refrigerant, and lubricant is not expected to result in significant air emissions, and thus is outside the scope of this permitting action under the CAA and does not require a response from EPA. VOC emission losses from the ultra-low sulfur diesel storage tanks are regulated by this OCS permit, *see* Response 10.21. *See* Response 4.2 for comments on OSS fuel use.

Comment 10.9
The presence of these towering structures according to EPA's and Atlantic Shores' own documents have increasing potential for dangerous air emissions and further highlights the potential for substantial adverse effects on air quality. Air pollutant emissions include, according to the EPA's Draft Permit for the Project: nitrogen oxides, carbon dioxide, volatile organic

compounds [aka VOCs, or forever chemicals], total suspended particles, particulate matter, with an aerodynamic diameter less than or equal to 10 micron, particulate matter with an aerodynamic diameter less than or equal to 2.5 microns, sulfur dioxide, greenhouse gas, HAPs (hazardous air pollutants), Sulfur hexafluoride (SF_6), Ultra Low Sulfur Diesel ("ULSD") storage tanks "which will emit fugitive VOC emissions" and other activities which will do the same. And based on its potential to emit air pollution, the Atlantic Shores Project is subject to the CAA's Prevention of Significant Determination ("PSD") and Non-Attainment New Source Review requirements, federal standards that apply to diesel engine, and several New Jersey State air regulations, because the Project has "the potential to **emit over 250 tons per year of any regulated NSR pollutant during both C&C and O&M**." *(Emphasis added by the commenter.)*

Response 10.9
40 C.F.R. § 55.1 states that, "Section 328(a)(1) of the Clean Air Act ("the Act"), requires the Environmental Protection Agency ("EPA") to establish requirements to control air pollution from outer continental shelf ("OCS") sources in order to attain and maintain Federal and State ambient air quality standards and to comply with the provisions of part C of title I of the Act." The OCS permit's requirements are intended to ensure that air emissions from this project's C&C and O&M phases are controlled in accordance with the Clean Air Act. The fact that this project will emit more than 250 tons per year of any regulated NSR pollutant means that PSD and NNSR requirements apply to the project, and thus the permit contains BACT and LAER, among other requirements, to control air emissions under these regulatory programs. *See* Response 5.22 for further discussion of PSD program requirements. In addition, air quality modeling analyses were conducted for the worst-case emissions possible under the terms and conditions of the OCS permit during both the C&C and O&M phase to ensure that the project would not cause or contribute to a violation of the NAAQS and PSD increment. For further discussion on this, *see* Section 5.0. EPA is issuing this final permit based on its conclusion that the project meets the applicable PSD and NNSR requirements.

The purpose of the PSD regulations under the CAA is to protect public health and welfare, preserve, protect, and enhance the air quality in national parks, national wilderness areas, and other similar areas, ensure economic growth occurs in a manner consistent with the preservation of existing clean air resources, and ensure that any decision to permit projects that increased air pollution is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.

Comment 10.10
Commenter urges the EPA to conduct a thorough and comprehensive review of the proposed wind turbines' impact on aviation safety and community welfare. It is crucial that all potential risks are meticulously assessed, and that the safety, health, air quality and well-being of the community and local residents are prioritized.

The EPA's Public Notice contemplates no reports except for once a year to assess the impact of the proposed wind turbine project by Atlantic Shores on air emissions. Considering the grotesque potential for particulate matter and dangerous SF_6 emissions by the lubricants involved in the construction and operation of the turbines, why aren't more reports required by Atlantic Shores? There is no contract, so any "promise" by Atlantic Shores rings hollow.

Response 10.10
Aviation issues are outside the scope of this permitting action under the Clean Air Act. However, we note that Section 3 of BOEM's Record of Decision outlines Navigational and Aviation Safety Conditions. Every wind turbine generator, offshore substation, and met tower will be clearly marked and each wind turbine generator will be lighted conforming to Federal Aviation Administration (FAA) standards.

Although the compliance data will be collected and calculations made by the Permittee on a daily or monthly basis, the EPA considers annual reporting for this type of project to be adequate. This project relies mostly on the use of regular marine vessels, engines, and switchgears, which are types of equipment that are not prone to significant air emission upsets that would require a more robust reporting requirement. For other concerns regarding SF_6 emissions, please *see* the responses in Section 1.0 of this document.

Comment 10.11
As a New Jersey homeowner, stakeholder, and concerned citizen, I am writing to respectfully request that the EPA also consider BOEM's other wind turbine leases in the vicinity of this Project. For example, there is a New York Bight Draft Programmatic Environmental Impact Statement ("PEIS") for the proposed project comprising six NY Bight lease areas ("the Project") offshore New Jersey and New York.

Response 10.11
Under the National Environmental Policy Act, BOEM went through a process to develop a Final Environmental Impact Statement for this project. *See* Response 4.4 for a link to BOEM's FEIS. Development of a programmatic environmental impact statement for this project is outside the scope of this OCS air permitting action under the Clean Air Act. *See* Response 5.18 for a discussion of cumulative impact reviews under PSD air quality analyses, and *see* Response 10.7 for a discussion on the New York Bight PEIS.

Comment 10.12
Right now, wind turbines emit bisphenol A (BPAs) and micro plastic in their blades. One of the biggest risks in pollution today is from these kinds of materials. Yes, there is research going on to find ways to control that. There is also research going on to find ways to more effectively recycle these turbines when they are done by using different materials, but the problem is, we are proceeding at breakneck speed before we have good solutions to many of the problems that this project and others like it are creating.

Response 10.12
Although the commenter raises general concerns about bisphenol A and micro plastic air emissions, it does not do so with adequate specificity to allow EPA to evaluate whether emissions of these substances, if any, and any potential impacts from such emissions, are at a level regulated by the Clean Air Act or state/local regulations incorporated by reference into 40 C.F.R. Part 55.

Disposal of the project's physical components after decommissioning is outside the scope of this OCS air permit under the Clean Air Act.

Comment 10.13
Incredulously, the Fact Sheet on p. 36, discusses Atlantic Shores eliminating cap and trade to mitigate the air polluting effects, for application expediency. "The application also eliminated carbon capture and storage, a GHG control option involving capturing and storing CO_2 emissions contained in engine exhaust, as technically infeasible for engines located onboard marine vessels." The Project is already incredibly polluting, yet there is no description of cap and trade for the pollutants located in the OSSs. Notwithstanding that it takes 25 to 37 years to clear emissions, anywhere from the length of the project itself to 25% longer than its duration; this Project is not green, but greenwashing the carbon emissions and greenhouse gasses that will result from C&C and O&M of the wind turbine's renewable energy.

Response 10.13
The fact sheet does not mention cap and trade, which generally refers to a system for controlling air emissions that limits emissions for an area or group of businesses and then establishes an accompanying trading program; cap and trade is not applicable to this permit as a control technology or to offshore wind farms in general. Regarding carbon capture and storage, it is not a technology that is widely used at this time, and it has been only considered technically feasible for a small number of (non-wind-farm) projects in which it can be successfully implemented, where they can meet certain specific technical requirements. As discussed in the Fact Sheet, carbon capture and storage is not technically feasible for the marine vessels that this project requires.

The project is expected to limit New Jersey's dependence on nonrenewable energies which do contribute to greenhouse gas emissions. According to BOEM, this project will have air emissions during the C&C phase, and lower air emissions during the O&M phase, but throughout its projected 30-year lifespan it will generate energy with much fewer emissions compared to other nonrenewable sources of electrical energy. *See* discussion in the ROD and FEIS, links to which are available in Responses 4.1 and 4.4. Also *see* Response 4.3.

Comment 10.14
These Industrial Utility Electric Power Plants contain hundreds of thousands of gallons of fossil fuel petrochemicals (listed below) subject to the North Atlantic corrosive saltwater environment suspended above our Ocean less than 9 miles from our beaches and homes. As we have seen with the closure of the beaches in Nantucket, these Industrial Offshore Wind Turbine Power Plants are machines that can and will fail. It is a matter of fact these will leak and spew fossil fuel petrochemicals into the air and water.

Each Wind Turbine Generator (WTG) Can use up to:
400 gals of diesel fuel
350 gals of hydraulic fluid
150 gals of grease
1,081 gals of gear and bearing lubricant
1,800 gals of synthetic ester oil
4,100 gals of water/ethylene glycol

243 lbs of sulfur hexafluoride

Each SMALL Offshore Substation can use up to:
7,500 gals of diesel fuel
37,000 gals of mineral oil
250 gals of sulfuric acid (batteries)
1,030 gals of water/ethylene glycol
3,500 gals of AFFF Firefighting aid
198 lbs of refrigerant
5 gals of lubricant
3,37 lbs of sulfur hexafluoride

Each LARGE Offshore substation can use up to:
20,000 gals of diesel fuel
185,000 gals of mineral oil
3,050 gals of water/ethylene glycol
5,000 gals of AFFF Firefighting aid
794 lbs refrigerant
15 gals of lubricant
9,480 lbs of sulfur hexafluoride

Each On Shore Substation can use up to:
1,500 gals of diesel fuel
10 gals of motor lubricant
272,500 gals of mineral oil
400 gals of sulfuric acid (batteries)
1,275 gals of water/ethylene glycol
794 lbs of refrigerant
11,023 of sulfur hexafluoride

Response 10.14
Commenter did not provide the source of the numbers presented so EPA was unable to corroborate them. The WTGs and OSSs will temporarily have portable diesel generator engines to be used to provide power during the construction and commissioning (C&C) phase. The permit outlines use of 8 OSS Commissioning Generators and 1 WTG Commissioning Generator during C&C. When the C&C phase is completed, up to 8 permanent diesel generators will be located on and used as backup generators for the OSSs during the O&M phase; these generators will be taken from the 8 OSS Commissioning Generators used during the C&C phase. These generators used during the O&M phase will only be used for storm protection and in a large power grid outage. All emissions from these generators were considered for CAA compliance, and the permit contains various conditions addressing these generators.

See Response 4.2 for more information on the OSS generators.
See Section 1.0 for more information regarding SF_6.
See Response 4.20 for comments regarding the Nantucket project.
See Response 4.41 regarding possible oil spill.

Most of the substances mentioned in this comment are not anticipated to be released to the air, and are thus not addressed by this OCS air permit.

Comment 10.15
The Atlantic Seaboard of the United States is consistently prone to hurricanes, with numerous hurricanes occurring annually. The proposed wind farms are not constructed to withstand a greater force than that of a Category 3 hurricane. In fact, studies have posited that in a Category 2 hurricane, up to 6% of the turbine towers in a wind farm will buckle. The same studies propose that in a Category 3 storm, a potential 46% of the towers will buckle. Category 3, 4 & 5 hurricanes are projected to cause 92% damage to the aforementioned turbines in New Jersey. Current International Electrotechnical Commission guidelines for offshore wind turbines do not address the type of winds seen in Category 3-5 hurricane levels. The high frequency of major storms along the Atlantic Coast are likely to significantly reduce the fatigue life of offshore wind turbine components.

Response 10.15
This comment is outside the scope of EPA's action on Atlantic Shores' OCS air permit application, and the commenter has not identified with specificity the studies referenced generally. However, we note that the design of the WTGs has considered the possible hurricane conditions that New Jersey is subject to. The following excerpt is from page 16 of Appendix B (page 185 of 208) of BOEM's ROD:

> *The engineering design of the WTGs [Wind Turbine Generators] and their ability to sufficiently withstand weather events— which include hurricane-level events—are independently evaluated by a CVA [Certified Verification Agent] when reviewing the FDR [Facility Design Report] and FIR [Fabrication and Installation Report] according to international standards. One of these standards calls for the WTG structure to be able to withstand a 50-year return interval event. An additional standard also includes withstanding 3-second gusts of a 500-year return interval event. WTGs are designed to withstand the oceanographic and meteorological conditions expected in the Lease Area, including hurricane force winds.*

See Response 4.1 for a link to the ROD.

Comment 10.16
Another potentially major concern in a hurricane is the extremely powerful force which turbines are subjected to not only due to increased winds but also from increased tidal pressures from waves. Turbines will also be subjected to increased wave action during the occurrence of other storms; the foremost of which being nor'easters, which occur frequently along New Jersey's coastline. These storms have the potential to degrade the turbines' operative efficiency, structural integrity, and economic viability. The turbines will also require far more frequent and invasive maintenance practices, as the environment that is the Atlantic Ocean is a much more hostile environment than land.

Response 10.16
See Response 10.15 which addresses both oceanographic and meteorological conditions expected in the Lease Area of the project. The applicant's expected air emissions during the O&M phase of the project are addressed in the OCS permit.

Comment 10.17
Offshore wind is obviously intermittent. Wind power can never be completely and consistently efficient, as wind strength rises and falls sporadically. Due to this inconsistency, old fossil fuel plants which may be harmful to the environment must remain functional to provide power in excess on days in which wind strength is not powerful enough to suffice.

Response 10.17
This comment is not under the purview of the Clean Air Act and this OCS air permit. However, we note the electricity generated from this project is expected to contribute towards New Jersey's goal (as outlined in the New Jersey Governor's Executive Order No. 307) of 11 GW of offshore wind generation by 2040. This is part of an effort to diversify New Jersey's energy sources and overall rely less on nonrenewable sources.

Comment 10.18
Offshore wind turbine performance over the last decade in Europe has hugely degraded rapidly over time, particularly for newer and larger turbines. Output has also been shown to tend to decrease as the units age and require ever-growing maintenance budgets. The natural consequence of this is a higher operating cost and reduced economic lifetimes. As costs increase and output declines, the costs of maintaining the project will far surpass expected revenues. The natural human response to this trending downturn in economic profit would be for the project's owner to shut down the project to preserve his or her own economic viability.

A 2020 study conducted upon the offshore wind farms located off of the coastline of Britain in the North Sea have shown that after 10 years, the average output of the newer offshore wind turbines was only slightly exceeding half of the initial output. This consequential drop in economic viability makes the turbines very expensive and inefficient to maintain. The study also showed that the performance of the newer, larger turbines was noticeably worse than that performance of the older turbines.

Response 10.18
This comment is outside the scope of this permitting action. However, EPA notes that the permit contains maximum allowable daily and annual air emissions during the O&M phase in which the Permittee will accomplish any required project maintenance.

Comment 10.19
The 2020 study of offshore wind farms in Britain also showed that the subsea transmission lines were highly notorious for both the severity and the length of their outages. In the United States, the Block Island Wind Farm's offshore cable was exposed due to erosion, with repairs and reburying of the cable taking over six months. These long periods of outages once again mandate the remaining of dirty fuel sources such as oil to maintain the power grid, The additional maintenance and employee costs of these old fossil fuel power plants makes this project even more economically unviable.

Response 10.19
This comment about the economic burden created by the maintenance of the subsea transmission lines and mandating that other oil-fired units remain on the power grid in the event of long

outages from the wind farm is outside the scope of this OCS air permit under the Clean Air Act. Any regular maintenance that the Permittee will need to accomplish during the O&M phase will need to comply with the maximum allowable daily and annual emission limits, and all other relevant permit requirements, applicable during the O&M phase.

We note that the subsea transmission lines are regulated by the National Oceanic and Atmospheric Administration (NOAA). *See* https://www.noaa.gov/submarine-cables. In addition, BOEM's ROD (page 87 of 208) lists special requirements that the project must comply with related to the routing, burial, and protection measures of the transmission cables. *See* Response 4.1 for a link to the ROD.

Comment 10.20
The proposed Atlantic Shores turbines have no planned secure barriers or surveillance, leaving them open to be undermined by foreign or domestic intrusions, thus having a potentially significant deleterious effect on the energy security of the United States.

Response 10.20
This comment is outside the scope of EPA's action on Atlantic Shores' OCS permit application under the Clean Air Act. However, EPA notes that Section 4 of Appendix A of the ROD (beginning on page 101 of 208) includes anticipated conditions of the Construction and Operations Plan Approval related to National Security. *See* Response 4.1 for a link to BOEM's ROD.

Comment 10.21
In terms of good tank design, we strongly recommend the installation of floating roof tanks. Given that the storage tanks will be storing diesel, a highly volatile petroleum product with high concentrations of VOCs, the floating roof tank provides the best design in order to minimize volatilization of the diesel. As the name suggests, this design consists of a floating roof that falls or rises according to the level of oil in the tank and therefore prevents the build-up of vapor inside the tank.

In terms of good operating and maintenance practices, we strongly recommend the usage of control technology when performing the following actions: filling the tank; landing the roof (emptying the tank); and cleaning the tank. These are the operating scenarios that generate the highest amounts of fugitive emissions coming from the tank. This occurs given the change in internal pressure in the tank. By using mobile (portable) control technology, these emissions are significantly minimized.

We recommend utilizing the NJDEP as a resource to determine how to best conduct these operating scenarios and further understand the difference between the usage of a floating roof tank and for example a fixed-roof tank.

Response 10.21
The permit outlines that the ULSD storage tanks will be light colored with a good tank design. In an effort to minimize emissions, the manufacturer's storage, operating, and maintenance procedures will be followed. Additionally, submerged fill will be utilized which adds the liquid fuel in beneath the liquid-vapor line, further preventing vaporization of the fuel. And, the permit

contains a limit on fugitive emissions of volatile organic compounds from these tanks. The exact final specifications of the USLD storage tanks are not known at this time. However, we expect these tanks to be subject to N.J.A.C. 7:27-16, "Control and Prohibition of Air Pollution by Volatile Organic Compounds" which prescribe state regulatory standards for such tanks.

Comment 10.22
Additionally, Representative Chris Smith (4th NJ) has called for a report to study offshore wind projects in the North Atlantic and Mid-Atlantic Planning Areas and their potential to weaken, degrade, interfere with, or nullify the performance and capabilities of radar relied upon by commercial aviation, military aviation, space launch vehicles, or other commercial space launch activities; and the development of offshore wind projects in the North Atlantic and Mid-Atlantic Planning Areas potential to degrade the capabilities of the Federal Aviation Administration to monitor United States airspace, or hinder commercial, private, or military aviation activities. We implore that this study be completed and published to ensure the protection of the airspace not just over the Borough of Sea Girt, but along the eastern seaboard of the United States.

Response 10.22
This comment is not under the purview of the Clean Air Act. However, we note that the ROD addresses concerns regarding radar interference:

> *Due to the potential interference with IOOS HF [Integrated Ocean Observing System – High Frequency]-radar and the risk to public health, safety, and the environment, the Lessee must mitigate unacceptable interference with IOOS HF-radar from the Project. The Lessee must mitigate interference before commissioning the first WTG [Wind Turbine Generator] or before blades start spinning, whichever is earlier, and interference mitigation must continue throughout operations and decommissioning until the point of decommissioning where all rotor blades are removed.*

The Federal Aviation Administration (FAA) was also involved to ensure compliance with their regulations. For more information regarding aviation, *see* Response 10.10.

Comment 10.22
Many assumptions about offshore wind farms in the Atlantic Shores Project are largely based upon European models. However, there is a singular wind farm in the Atlantic Ocean off the coast of Brittany, which has only been operational for less than two years. There is little to no information or experience on wind farms in the Atlantic Ocean.

Response 10.22
There is no reason to suspect that wind farms in the Atlantic Ocean will behave differently from European models. In addition, the commenter did not provide any reason why assumptions regarding Atlantic and European wind farms should differ.

Comment 10.23
Commenter respectfully requests that the federal and state government, who have joint and several jurisdictions over this project, identify any health studies that were completed, and how they were incorporated into the Pre-Build Infrastructure (PBI) [Request for Proposal] RFP, to ensure that risk to local residents is minimized. We would like these independent verifiable

comprehensive health studies published, and we would like the RFP for the PBI to be rebid to ensure that the health and safety of the Borough is included as a criteria of the RFP bid, based on the studies indicated – as well as other necessary criteria to ensure residents are protected from ill effects of the project – to the extent possible, without impairing the effectiveness of the project.

Response 10.23
The Pre-Build Infrastructure that the commenter is referring to, relates to certain onshore infrastructure which is outside the scope of this OCS air permitting action under the Clean Air Act.

Section 11.0 – Public Review Process

Comment 11.1
Commenter is disappointed that EPA and BOEM, together with certain New Jersey state agencies, have rushed this process and have been less than transparent. This process of steamrolling through the regulatory process, rather than following a deliberate and transparent process, is contrary to the intent and purpose of the Administrative Procedures Act's provisions regarding public participation and comment. Adequate public participation in the process is essential but lacking. One of the shortfalls in this process is the failure of the EPA to answer questions during the process. Questions were not considered during the August 12 virtual hearing.

Previous public engagement sessions for different parts of the environmental review process, such as the Environmental Impact Statement, did not discuss potential air pollutants in any detail. As a result, the public has not received any informational outreach on the air quality aspects of Projects 1 and 2.

We implore the EPA to change its approach so that it carries out its overarching mandate to protect human health and the environment.

Response 11.1
Under CAA section 165, 42 U.S.C. § 7475, the EPA must issue a final permit decision (i.e., grant or deny a permit) on a PSD air permit application within one year of when EPA determines the application to be complete. The EPA issued a draft permit, and discussed the basis for the draft permit (proposing to grant a permit) in the accompanying Fact Sheet for this project; the EPA accepted public comment on the draft permit for 35 days, from July 12, 2024 to August 16, 2024; and held a virtual public hearing to seek public comments on the draft permit. The length of the public comment period complies with the requirements of 40 C.F.R. Part 124, and EPA held the virtual public hearing to provide the public with an additional manner in which to provide comments. Questions were not considered during the virtual public hearing as EPA sought to maximize the time available to the public to submit oral comments. EPA did not receive any requests to extend the public comment period. The public was able to submit both oral and written public comments, including expressing questions, which we are responding to in this document. EPA's public notice and comment for this permit meets all of the applicable administrative procedures and timelines for this action.

The Clean Air Act (CAA) environmental review of the project is separate from the process for developing and issuing BOEM's Final Environmental Impact Statement. BOEM's Draft Environmental Impact Statement (DEIS) was available for public review and comment on May 15, 2023.

Comment 11.2
A transcript of the public hearing will be created and provided in the docket; however, the transcript has not been made available to the public before the deadline for written comments. While this is likely due to understandable quality control and assurance procedures, the timing means that members of the public interested in commenting on the air permit but unable to attend the single public hearing will not be able to benefit from information shared by other stakeholders in preparing their written comments. Thus, EPA did not factor in enough time for commenting to allow for a more purposeful and meaningful due process.

Response 11.2
The federal regulations under 40 C.F.R. Part 124 do not require EPA to release a copy of the public hearing transcript during the public comment period or prior to final agency action on this project. We note that the public comment period ran until August 16th, 2024, four days after the virtual public hearing was held on August 12th. The purpose of the public hearing was to give the public the opportunity to provide oral comment to the EPA on the draft permit.

Comment 11.3
Regarding the comment period deadline, the public notice included in the official docket listed the deadline as August 13, 2024. However, EPA's website contained text saying that the deadline would be extended to August 16, 2024. There was no notice of the extension posted to the official docket. This caused confusion, as the official docket is typically the most reliable resource for public comment deadlines, but an EPA representative stated at the public hearing that the August 13 date was incorrect, and comments would instead be due on August 16.

EPA, as the federal agency responsible for the permit and for representing the public interest, should have conducted multiple public hearings in advance of the written comment deadline, given official notice of the deadline extension for written comments, and given the public opportunities to be presented with information about the air quality aspects of the projects.

Response 11.3
On July 17, 2024, within the first week of when the public comment period began, EPA extended the public comment period date from August 13th to August 16th, 2024 and as originally scheduled, the public hearing was held on August 12th. The initial public announcement and official docket contain information directing the public to three separate EPA web pages. The announcement of the extension of the public review period was available on all of the three EPA web pages. In addition, this change provided the public with extra time for review.

For further discussion of the adequacy of EPA's public notice and comment process, *see* Responses 11.1, 11.2, and 11.3.

Comment 11.4
Why haven't all residents not been informed of the plans to run massive megawatt cables through our coastal towns. Most residents question whether the state and federal governments are working for the people. Where is the transparency? How did this project get this far?

Why do our state and federal government have this project on a hyper-fast track, without proper vetting? Has there been any real research done regarding the health and environmental impact of running the power of approximately 8 nuclear reactors through our residential communities? If so, please show us.

Response 11.4
See Responses 4.36, 11.1, 11.2, and 11.3. Onshore components related to this project are outside the scope of this OCS air permit. With regards to the timing of the OCS air permitting process under the Clean Air Act, Atlantic Shores initially submitted an OCS air permit application on September 1, 2022. Following submissions of revisions and additional information to the application on multiple dates, EPA found the application complete on August 21, 2023 and issued a draft OCS air permit on July 12, 2024. In line with the public comment period requirements of 40 C.F.R. Part 124, EPA held a 35-day public comment period ending on August 16, 2024, including a virtual public hearing on August 12, 2024. EPA has reviewed the project and the applicant's submission and written the OCS air permit to contain the requirements necessary pursuant to the CAA. EPA has also reviewed and considered all public comments it received, and is addressing those comments in this Response to Comments document.

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Summary of All Changes from Draft OCS Permit to Final OCS Permit as a Result of Comments Received During the Public Comment Period

Below is a summary of all of the changes EPA made between the draft OCS air permit and final OCS permit as a result of the comments received during the public review period. All of these changes are discussed elsewhere in this Response to Comments document, and are repeated here for the convenience of the reader. Newly added text is indicated in blue bold, and deleted text is indicated in red strikeout. The page number indicated for each change is the page number of the revised language in the final permit.

1) **Page 1: Editorial changes on the signature page:**

Atlantic Shores Offshore Wind Project 1, LLC is hereby authorized to construct and operate ~~the~~ **two** offshore wind farm**s** ~~project~~ located on the OCS within the lease area OCS-A 0499, about 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. The construction and operation of the **two** wind farm**s** shall be subject to the attached permit conditions and permit limitations.

2) Page 7: Editorial changes in the Project Description:

Atlantic Shores Offshore Wind Project 1, LLC ("Atlantic Shores" or "Permittee"), along with its affiliate, Atlantic Shores Offshore Wind Project 2, LLC ("Atlantic Shores Project 2 Company"),

proposes to construct (install) and operate ***two offshore wind farms totaling*** ~~an~~ approximately ***2,840*** ~~2,470~~ megawatt**s** ("MW") ~~offshore wind farms project~~ in the designated Renewable Energy Lease Area OCS-A 0499 awarded by BOEM. The Lease Area covers approximately 102,124 acres located approximately 7.6 nautical miles (8.7 statute miles) from the New Jersey shoreline. Atlantic Shores and its affiliate, Atlantic Shores Project 2 Company, propose to develop the OCS lease area into two wind farms, known as Atlantic Shores Project 1 ("ASP1") (1,510 MW) and Atlantic Shores Project 2 ("ASP2") (**target capacity of 1,327** ~~960~~ MW), collectively referred to as the OCS Facility.

3) **Page 13 – New "/OSS" abbreviation added under the Activity/Vessel Description Column:**

Representative Vessel Types for WTG Installation (for both ASP1 and ASP2[a])	Activity/Vessel Description	Identified in Application as OCS Source? (Y/N)[b]	Marine Engines (per each vessel): Type (Main or Auxiliary), Number & Maximum Engine Power (in kW/engine)
Jack-Up Vessel	WTG**/OSS** Installation	Y	Main engines (4): 3,535, all Category 3. Main engines (3): 2,650, all Category 3. Auxiliary engine (1): 2,650, Category 3.

4) **Page 21- Editorial changes to Condition IV.A.1.a. to include additional uses of the jack-up vessels during the C&C phase listed in the application:**

a. During C&C, the three representative jack-up vessels identified in Table 1A to this permit**, which will be used for installation activities related to the WTGs and/or OSSs and their foundations,** ~~that will be used for the WTGs installation activities~~, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit.

5) **Page 21- Correction of a typographical error in Condition IV.A.1.b.:**

b. During O&M, the three representative jack-up vessels which will be used for WTGs Heavy Logistics activities and one additional representative jack-up vessel that will be used for ~~OCS~~ **OSS** major repair, which are identified in Table 1B to this permit, shall be the sole marine vessels authorized by this permit to operate as OCS source vessels, as the term is defined in this permit.

6) **Pages 26-27 – Correction of sequential typographical errors in Condition IV.A.5.:**

Conditions IV.A.5.(**f.,g.,h.,i**.) renumbered to Conditions IV.A.5.(**a.,b.,c.,d**.).

7) **Page 29 – Revision on $PM_{2.5}$ emission factor in Condition IV.B.1.b.**

Maximum Engine Power	NO_x (g/kW-hr)	VOC (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)	PM_{10}* (g/kW-hr)	$PM_{2.5}$* (g/kW-hr)
130 ≤ kW ≤ 560	0.40	0.20	3.5	0.02	0.02	0.0~~1~~2

*The PM_{10} and $PM_{2.5}$ (g/kW-hr) emission limits includes both filterable and condensable fractions of PM.

8) **Page 34 - Revision of Condition IV.D.2.d. to address comments received.**

d. Upon a detectable pressure drop that is 10 percent of the original pressure (accounting for ambient air conditions) for any switch or SF_6 gas-insulated bus duct, perform maintenance on an SF_6-insulated electrical switchgear to fix seals as soon as practicable but no later than 5 days after the pressure drop is detected. If repair or replacement cannot occur within 5 days of the detected leak, then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed. **If repair or replacement cannot occur within 5 days of the detected leak because dangerous weather conditions prevent the repair within that period, then: 1) the Permittee shall fix seals at the soonest weather-permitting accessible day but no later than 14 days after the pressure drop is detected; and 2) if the repair cannot occur within 14 days of the detected leak then the Permittee shall divert power from the affected electrical switchgear(s) and isolate the leak until the repair or replacement can be performed.** The Permittee shall document and maintain records of the equipment repaired or replaced, including but not limited to, the estimated time of leakage and volume of gas leaked during that time **as well as records and documentation of any claim(s) that dangerous weather delayed repair or replacement.** [40 C.F.R. § 52.21]

9) **Page 34 – Revision of Condition IV.D.2.e. to address two comments received.**

e. If an event requires the removal of a switchgear, the ~~affected~~ **damaged** major components will be replaced with new components **or repaired in accordance with OEM recommended procedures.** For purposes of this requirement, an event means when any component of a switchgear is damaged and results in SF_6 leakage that cannot be repaired on site. **The Permittee shall consider the technical and economic viability of installing SF_6-free switchgears whenever an SF_6-containing switchgear needs to be replaced with a new one and install the SF_6-free switchgear, if deemed technically feasible. The Permittee shall keep a record of this decision and its basis for each replaced switchgear.**

10) **Page 41 – Correction of a typographical error in Condition IV.H.1.b.1.**

b. 9.09 tpy of VOC, from the following source:
   1) Logan Generating Plant, NJDEP Program Interest number PI 55834, 76 RT 130, South Swedesboro, NJ 08085 (shutdown of emission sources)

11) **Page 42 – Correction of a typographical error in Condition IV.I:**

Condition IV.I.2. renumbered to Condition IV.I.1.

12) **Page 45 – Revision to Condition V.2.a. to address comments received:**

a. For emission points where visible emissions are observed, the Permittee shall initiate corrective action within no more than eight hours of the initial observation, **or within no more than 24 hours of the initial observation if limited remaining daylight hours prevent faster action.**

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