UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
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BOSTON, MA 02109-3912

FACT SHEET

Outer Continental Shelf Preconstruction Air Permit
130 MW Offshore Windfarm
South Fork Wind, LLC

Offshore Renewable Wind Energy Development
Renewable Energy Lease Area OCS-A 0517
EPA Draft Permit Number
OCS-R1-04

Acronyms and Abbreviations

BACT	Best Available Control Technology
BOEM	Bureau of Ocean Energy Management
CAA	Clean Air Act
CA SIP	California State Implementation Plan
CERC	Continuous Emission Reduction Credit
C.F.R.	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
COA	Corresponding onshore area
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
DERC	Discrete Emission Reduction Credit
EAB	Environmental Appeals Board
EGRID	Environmental Protection Agency's Emissions & Generation Resource Integrated Database
EPA	United States Environmental Protection Agency
EJ	Environmental Justice
ERC	Emission Reduction Credit
ESA	Endangered Species Act
FWS	U.S. Fish and Wildlife Service
g/kw-hr	Grams per kilowatt-hour
H_2SO_4	Sulfuric acid
HAP	Hazardous Air Pollutant
ISO NE	ISO New England
KV	Kilovolt
KW	Kilowatt
LAER	Lowest Achievable Emission Rate
MassDEP	Massachusetts Department of Environmental Protection
MW	Megawatt
NHPA	National Historical Preservation Act
NMFS	National Marine Fisheries Service
NMHC	Non-methane hydrocarbons
NNSR	Nonattainment New Source Review
N_2O	Nitrous oxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
OCS	Outer Continental Shelf
OECLA	Offshore Export Cable Laying Activities
OSS	Offshore Substation
Pb	Lead
PM	Particulate matter

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PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PSD	Prevention of Significant Deterioration
PTE	Potential to emit
SIL	Significant Impact Levels
SO_2	Sulfur dioxide
tpy	Tons per year
SFW	South Fork Wind, LLC
VOC	Volatile organic compounds
WA	Work Area
WTG	Wind Turbine Generators

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I. General Information

Applicant's name and address:	South Fork Wind, LLC 56 Exchange Terrace, Suite 300 Providence, RI 02903
Location of regulated activities:	Outer Continental Shelf (OCS) Lease Area 0517 is located in federal waters southwest of Martha's Vineyard, Massachusetts.
Draft OCS permit number:	OCS-R1-04
EPA contact:	Undine Kipka Air Permits, Toxics, and Indoor Programs Branch EPA Region 1 5 Post Office Square Suite 100 (05-2) Boston, MA 02109-3912 Telephone: (617) 918-1335 Email: kipka.undine@epa.gov

On February 1, 2019, Deepwater Wind South Fork, LLC (or the applicant, now South Fork Wind, LLC (SFW)) submitted to EPA Region 1 (EPA) an initial application requesting a Clean Air Act (CAA or the Act) permit under Section 328 of the CAA for the construction and operation of an offshore windfarm, including export cables, on the OCS (the windfarm). SFW has an agreement under which the Long Island Power Authority has agreed to purchase 130 MW generated from the project.[1] On September 30, 2020, SFW submitted a revised application which was deemed complete on January 13, 2021. The EPA is proposing a draft permit that will contain the applicable requirements under 40 C.F.R. part 55. Due to the fact that the decommissioning phase of the windfarm will occur well into the future, the EPA is unable to determine best available control technology (BACT) and lowest achievable emissions rate (LAER) for the decommissioning phase and will not be permitting this phase at this time.

After reviewing the application and additional information, the EPA prepared this Fact Sheet and draft OCS air permit as required by 40 C.F.R. part 124 - Procedures for Decision Making. All CAA permitting requirements are contained within EPA permit number OCS-R1-04.

The EPA's draft permit is based on the information and analysis provided by the applicant and the EPA's own technical expertise. This Fact Sheet documents the information and analysis the

[1] Although the windfarm was originally proposed as a 90 MW project, the Long Island Power Authority agreed to purchase an additional 40 MW in November 2018. See: https://www.lipower.org/wp-content/uploads/2019/10/LIPA-First-Offshore-Wind-Farm-Doc-V19_102819-FINAL.pdf. The additional power will be generated from an updated turbine design and the change in maximum capacity has no impact to air pollution control requirements included in this permit.

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EPA used to support the OCS draft permit. It includes a description of the proposed windfarm, the applicable regulations, and an analysis demonstrating how the applicant will comply with the requirements contained in the permit.

Based on all submitted information from SFW, including information provided by SFW's consultants, the EPA has concluded SFW's application is complete and provides the necessary information. *See* 40 C.F.R. part 55. The EPA is making SFW's submitted information part of the official record for this Fact Sheet and the CAA permit. The initial applications and supplemental information for the permit are available on-line at the EPA Region 1 Web Site https://www.epa.gov/caa-permitting/caa-permitting-epas-new-england-region.

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II. Location and Description of the Project

The SFW windfarm includes up to 15 wind turbine generators (WTGs) with a capacity of 6 to 12 megawatts (MW) per turbine, submarine cables between the WTGs (inter-array cables), and an Offshore Substation (OSS), all of which will be located within federal waters on the OCS, specifically in the Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0517. The work area for the project will be located approximately 19 statute miles southwest of Nomans Land, Massachusetts. An alternating current electric cable will connect the SFW windfarm to the existing mainland electric grid in East Hampton, New York.

Construction on the project is scheduled to begin in 2022 and to be commissioned and operational by the end of 2023. SFW's air permit application and associated air dispersion modeling scenarios assume a worst-case emission scenario of one year of construction, though construction could occur over two years. SFW will be responsible for the construction, operation and maintenance (O&M) of the windfarm.

III. Equipment, Activity and/or Facility Subject to CAA Permitting

A. OCS Statutory and Regulatory Requirements

Section 328(a) of the CAA requires that the EPA establish air pollution control requirements that are the same as onshore requirements for equipment, activities or facilities locating on the OCS, which meet the definition of an OCS source, and are located within 25 nautical miles of a states'[2] seaward boundaries. To comply with this statutory mandate, on September 4, 1992, the EPA promulgated 40 C.F.R. part 55, which established requirements to control air pollution from OCS sources in order to attain and maintain federal and state ambient air quality standards.[3]

The Energy Policy Act of 2005 (*See* Title III (Oil and Gas), Subtitle G – Miscellaneous, Section 388) amended section 8 of the Outer Continental Shelf Lands Act (OCSLA) to allow the EPA and the Department of the Interior to authorize activities on the OCS that "produce or support production, transportation, or transmission of energy from sources other than oil and gas." Section 4(a)(1) of OCSLA was recently amended to expand the scope of "exploring, developing or producing resources" to include "non-mineral energy resources" such as offshore wind. *See* William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. § 9503 (2021). BOEM reviews construction and operation plans from wind energy developers and approves, disapproves, or approves those plans with modifications. EPA issues a CAA OCS permit when the definition of OCS source is met, as defined in CAA § 328 and 40 C.F.R. part 55.[4]

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[2] The term "state," when used to reference one of the 50 states within the United States, includes states that are officially named commonwealths, e.g., the Commonwealth of Massachusetts.

[3] Refer to the Notice of Proposed Rulemaking, December 5, 1991 (56 Fed. Reg. 63,774), and the preamble to the final rule promulgated September 4, 1992 (57 Fed. Reg. 40,792) for further background and information on the OCS regulations.

[4] A copy of the Construction and Operation Plan may be found at https://www.boem.gov/renewable-energy/state-activities/south-fork (last visited on November 30, 2020).

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Under CAA § 328(a)(4)(C) and 40 C.F.R. § 55.2, an OCS source includes any equipment, activity, or facility which:

(1) Emits or has the potential to emit any air pollutant;

(2) Is regulated or authorized under the OCSLA (43 U.S.C. § 1331 et seq.); and

(3) Is located on the OCS or in or on waters above the OCS.

Furthermore, 40 C.F.R. § 55.2 establishes that for a vessel to be considered an OCS source the vessel must also meet one of the two following criteria:

(1) Permanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, within the meaning of section 4(a)(1) of OCSLA (43 U.S.C. §1331 et seq.); or

(2) Physically attached to an OCS source, in which case only the stationary sources [sic] aspects of the vessels will be regulated.

Finally, under 40 C.F.R. § 55.2, the term "[o]uter continental shelf" shall have the meaning provided by section 2 of the OCSLA (43 U.S.C. § 1331 et seq.), which in turn defines the "outer continental shelf" as "all submerged lands lying seaward and outside of the area of lands beneath navigable waters as defined in section 1301 of this title, and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control."

Once an activity, facility, or equipment (which may include a vessel) is considered an OCS source, then the emission sources of that OCS source become subject to the requirements of 40 C.F.R part 55, which include: (1) obtaining an OCS air permit, as required by 40 C.F.R. § 55.6; (2) complying with the applicable federal regulations and requirements specified at 40 C.F.R. § 55.13; (3) for an OCS source within 25 nautical miles of a state's seaward boundary, complying with the state or local air emissions requirements of the corresponding onshore area (COA) specified at 40 C.F.R. § 55.14; (4) monitoring, reporting, inspection, and enforcement requirements specified at 40 C.F.R. §§ 55.8 and 55.9; and (5) permit fees as specified under 40 C.F.R. § 55.10.

B. Procedural Requirements for Permitting

Regulations developed pursuant to OCS statutory requirements under section 328 of the CAA are codified at 40 C.F.R. part 55. The OCS regulations create procedures that require an applicant seeking to construct and operate an OCS source to identify the federal regulations and the state and local regulations from the COA, that may apply to the source and to seek to have those regulations apply, as a matter of federal law, to the OCS source. Once receiving a complete permit application, the EPA[5] then follows the applicable procedural requirements for federal permitting contained in 40 C.F.R. part 124 or 40 C.F.R. part 71, and the EPA issues an OCS

[5] The authority granted to the "Administrator" in 40 C.F.R. part 55 has been delegated to the Regional Administrator in EPA Region 1. *See* Docket for Delegation of Authority.

permit that meets all federal requirements.[6] The EPA is following the applicable procedures in 40 C.F.R. part 124 in issuing this OCS permit.

The OCS regulations first require the applicant to submit a notice of intent (NOI) to the nearest EPA regional office. *See* 40 C.F.R. § 55.4. The NOI provides emissions information regarding the OCS source, including information necessary to determine the applicability of onshore requirements and the source's impact in onshore areas. *See* 40 C.F.R. § 55.5. SFW submitted to the EPA an NOI for the windfarm on February 1, 2019. Information provided in the NOI for this windfarm indicated that Massachusetts is the nearest onshore area (NOA). The EPA did not receive a request from another state to be designated the COA for this project, thus Massachusetts is designated the COA. *See* 40 C.F.R. § 55.5(b)(1).

The federal requirements that apply to an OCS source are provided in 40 C.F.R. § 55.13. The EPA also reviews the state and local air requirements of the COA to determine which requirements should be applicable on the OCS and revises 40 C.F.R. part 55 to incorporate by reference those state and local air control requirements that are applicable to an OCS source. *See* 40 C.F.R. § 55.12. Once the EPA completes its rulemaking to revise 40 C.F.R. part 55, the state and local air regulations incorporated into 40 C.F.R. part 55 become federal law and apply to any OCS source associated with that COA.

Under this "consistency update" process, the EPA must incorporate applicable state and local rules into 40 C.F.R. part 55 as they exist onshore. This limits the EPA's flexibility in deciding which requirements will be incorporated into 40 C.F.R. part 55 and prevents the EPA from making substantive changes to the requirements it incorporates. As a result, the EPA may be incorporating rules into part 55 that do not conform to certain requirements of the CAA or are not consistent with the EPA's state implementation plan (SIP) guidance. The EPA includes all state or local air requirements of the COA except any that are not rationally related to the attainment or maintenance of federal or state ambient air quality standards or part C of Title I of the Act, that are designed expressly to prevent exploration and development of the OCS, that are not applicable to an OCS source, that are arbitrary or capricious, that are administrative or procedural rules, or that regulate toxics which are not rationally related to the attainment and maintenance of federal and state ambient air quality standards.

Consistency updates may result in the inclusion of state or local rules or regulations into 40 C.F.R. part 55, even though the EPA may ultimately disapprove the same rules for inclusion as part of the State's SIP. Inclusion in the OCS rule does not imply that a rule meets the requirements of the CAA for SIP approval, nor does it imply that the rule will be approved by the EPA for inclusion in the SIP.

On February 12, 2018 (83 FR 5971), the EPA published a Notice of Proposed Rulemaking (NPRM) proposing to incorporate various Massachusetts air pollution control requirements into 40 C.F.R. part 55. On March 9, 2018, the Commonwealth of Massachusetts amended certain regulatory provisions that pertained to the EPA's February 12, 2018 proposed rulemaking. Subsequently, the EPA reopened the comment period for 30 days and provided notice that the EPA modified the proposed regulatory text for incorporation by reference in the consistency

[6] *See* 40 C.F.R. § 55.6(a)(3).

update. *See* 83 FR 21254 (May 9, 2018). The EPA published the final rulemaking notice for the consistency update to part 55 on November 13, 2018. *See* 83 FR 56259. The Massachusetts regulations that the EPA incorporated into part 55 in this action are the applicable provisions of (1) 310 CMR 4.00: Timely Action Schedule and Fee Provisions; (2) 310 CMR 6.00: Ambient Air Quality Standards for the Commonwealth of Massachusetts; (3) 310 CMR 7.00: Air Pollution Control; and (4) 310 CMR 8.00: The Prevention and/or Abatement of Air Pollution Episode and Air Pollution Incident Emergencies, as amended through March 9, 2018. Upon receipt of SFW's NOI, EPA reviewed the regulations incorporated by reference in the 2018 consistency update and determined a part 55 consistency update was not necessary for Massachusetts regulations amended between March 9, 2018 and the date of issuance of this draft permit, June 24, 2021.[7]

The OCS permit applicant then follows the procedural requirements to obtain a federal permit as outlined in 40 C.F.R. part 124. The applicant submits an air permit application that provides the information to show that it will comply with all applicable federal requirements, including those requirements found in 40 C.F.R. part 55 (which, because of the consistency update, include certain state and local requirements incorporated by reference into federal law), and any other federal standard that may apply to the source. The EPA reviews the application and proposes either to approve or deny the application. Next, if the EPA decides to propose approval, the EPA drafts a proposed air permit and a fact sheet that documents its proposed permit decision. The EPA then provides a notice and comment period of at least 30 days for the draft permit and may also hold a public hearing if there is a significant degree of public interest and/or a hearing might clarify issues involved in the permit decision. Following the comment period, the EPA responds to all significant comments raised during the public comment period, or during any hearing, and issues the final air permit decision.

C. Work Area

The pollutant-emitting activities within the work area (WA) are part of a single plan to construct and operate an offshore windfarm. The WA facility comprises the offshore WTGs and their foundations, an OSS and its foundation, and inter-array cables. In addition to the windfarm components in the WA, the facility will include vessels when they meet the definition of an OCS source in 40 C.F.R. § 55.2. The EPA finds it appropriate and reasonable to aggregate the estimated 15 WTGs, OSS, and OCS source vessels, operating within the WA, into a single OCS facility for purposes of applying the part 55 OCS permitting regulations and a single stationary source for purposes of applying the prevention of significant deterioration (PSD) and nonattainment new source review (NNSR) permit program elements. This approach is supported by the definition of OCS source within CAA section 328 and 40 C.F.R. part 55, as well as the definition of a stationary source within the context of the NNSR and PSD permitting programs. Additional information is provided about EPA's source determination under New Source Review (NSR) and Title V of the CAA in section IV.A. of this document.

As required by section 328 of the CAA, when a vessel does not meet the definition of an OCS source, the emissions from vessels servicing or associated with any part of the OCS source are

[7] The memo documenting the determination that a consistency review update is not necessary is included with the administrative record for the permit.

still included in the potential emissions from the facility when the vessel is within 25 nautical miles of the centroid of the source, including while traveling to and from any part of the OCS facility.[8] The emissions from vessels are not regulated by specific control technology requirements when the vessel does not meet the definition of an OCS source and is not itself a stationary source, but these emissions are included when making the following determinations regarding the equipment and activities in the WA facility that are OCS sources:

1. Applicability of CAA programs and COA requirements, including NNSR and PSD permitting;
2. When calculating the number of NOx offsets required due to emissions during the construction and operational phases; and
3. When determining the impact of emissions on ambient air and Class I areas.

Jack-up vessels, support vessels or other vessels may contain emission equipment that would otherwise meet the definition of "nonroad engine," as defined in section 216(10) of the CAA. However, based on the specific requirements of CAA section 328, emissions from these otherwise nonroad engines on subject vessels are considered as direct emissions from the OCS source with which they are associated for the purposes of calculating potential emissions of that OCS source. Similarly, all engines, including engines on vessels that meet the definition of an OCS source and are "operating as OCS sources" are regulated as stationary sources and are subject to the applicable requirements of 40 C.F.R. part 55, including control technology requirements.

D. Emissions During the Construction, Operation and Maintenance

The following tables contain the windfarm's estimated emissions during the construction and operation and maintenance phases, as contained in SFW's revised application and supplemental information provided on November 4, 2020, January 4, 2021 and January 11, 2021.

Table 1. Estimated Construction OCS Emissions (tons)

CO_2	CH_4	N_2O	Black Carbon	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	VOC
20,775	0.1	1	7.9	47.4	320.2	10.7	10.3	2.4	0.001	7.4

[8] For the purposes of determining the potential emissions, the EPA has determined it is appropriate to use the center of the WA, i.e., the centroid, as the point to estimate vessel emissions within 25 nautical miles of the facility. With a fixed point, SFW will be accounting for vessel emissions sometimes from slightly more than 25 nautical miles from the OCS source and sometimes less. The use of a centroid should result in a slight overestimate of emissions on some days canceling out the slight underestimate of emissions on other days. Using the center as the point to estimate emissions is a sensible approach for permitting and enforcement purposes and provides greater certainty for the EPA and the permit applicant.

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Table 2. Estimated Operations and Maintenance Emissions (tpy)

CO_2	CH_4	N_2O	Black Carbon	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	Lead	VOC
1,173	0.01	0.1	0.5	3.3	19.2	0.6	0.6	0.1	0.0001	0.4

IV. Applicability of New Source Review Requirements

The NSR provisions of the CAA are a combination of air quality planning and air pollution control technology provisions that require stationary sources of air pollution to obtain permits before they are first constructed or engage in a modification of an existing facility. Part C of Title I of the CAA contains the PSD program, which reflects the requirements for the preconstruction review and permitting of new and modified major stationary sources of air pollution (specifically, sources emitting specific amounts of regulated NSR pollutants) located in areas meeting the National Ambient Air Quality Standards (NAAQS) ("attainment" areas) and, areas for which there is insufficient information to classify an area as either attainment or nonattainment ("unclassifiable" areas). Under the PSD program, new major stationary sources and major modifications of existing sources must apply best available control technology (BACT) for each regulated NSR pollutant emitted above specific thresholds and conduct an air quality analysis to demonstrate that the proposed source will not cause or contribute to a violation of any NAAQS or PSD increment.[9]

Part D of Title I of the CAA contains the NNSR program, reflecting the requirements for the preconstruction review and permitting of new and modified major stationary sources of air pollution locating in areas designated as not meeting the NAAQS ("nonattainment" areas). Under the NNSR program, new major sources and major modifications of existing sources in a nonattainment area must apply control technology that meets the statutory definition of LAER and must obtain emissions reductions from existing sources to offset the emissions increase from the new or modified source and ensure that the emissions increase will not interfere with a state's reasonable further progress toward attainment of the NAAQS.[10]

The permit program for non-major sources and minor modifications to major and non-major sources is known as the minor NSR program. CAA section 110(a)(2)(C) requires states to develop a permitting program to regulate the construction and modification of any stationary source "as necessary to assure that [NAAQS] are achieved."

To comply with the requirements of the CAA and the NSR implementing regulations at 40 C.F.R. § 51.160 through § 51.166, most states have EPA-approved SIPs in place to implement the PSD, NNSR, and minor NSR preconstruction permit programs. Together, the PSD, NNSR, and minor NSR permitting programs ensure that construction of new and modified stationary sources of air pollutant emissions do not significantly deteriorate air quality in "clean areas," impede reasonable further progress in nonattainment areas, or interfere with maintenance of any NAAQS. The applicability of the PSD, NNSR or minor NSR programs to a stationary source

[9] *See* CAA section 165(a).
[10] *See* CAA section 173(a) and (c).

must be determined in advance of construction and is a pollutant-specific determination. Thus, a stationary source may be subject to PSD for certain pollutants, NNSR for some pollutants, and minor NSR for others after assessing the quantity of emissions, the regulated NSR pollutants emitted, and the area's attainment status.

EPA has delegated the PSD program to Massachusetts and has not approved a SIP to implement the PSD program. Currently, the state operates under a Memorandum of Understanding with EPA to allow PSD provisions to be enforceable.[11] Pursuant to Massachusetts' NNSR provisions in 310 CMR 7.00, Appendix A, sources with a potential to emit equal to or greater than 50 tons per year of nitrogen oxides (NOx) or 50 tons per year (tpy) of voltile organic compounds (VOC) qualify as major stationary sources. New major stationary sources are subject to NNSR permitting requirements, including LAER and emissions offsets, for any pollutant (i.e., NOx or VOC) which the source has the potential to emit in amounts equal to or greater than the respective major source threshold.

The CAA requires PSD programs to apply to any major emitting facility, defined as a stationary source that emits, or has a potential to emit, at least 100 tpy of a regulated NSR pollutant, if the source is in one of 28 listed source categories, or, if the source is not, then at least 250 tpy of a regulated NSR pollutant. See 42 U.S.C. 7479(1); 40 C.F.R. § 51.166(b)(1); and 40 C.F.R. § 52.21(b)(1). New major stationary sources in Massachusetts are subject to PSD permitting requirements, including BACT and air quality impact analyses, for any regulated NSR pollutant that the source has the potential to emit in an amount equal to or greater than pollutant-specific significant emissions rates contained in the regulations. Additionally, in Massachusetts, BACT and other state requirements still apply if the Potential to Emit (PTE) for a criteria pollutant is below PSD thresholds but above the state's minor NSR thresholds.

Dukes County, Massachusetts is currently designated as a marginal nonattainment area for the 2008 ozone NAAQS. *See* 40 C.F.R. § 81.322. However, this is not the only factor to consider when analyzing the applicability of NNSR in Massachusetts (the COA for this project). Parts of the OCS source are closer to Bristol County, Massachusetts, than they are to Dukes County. Bristol County is not a nonattainment area for ozone. However, because Massachusetts is part of the Ozone Transport Region (OTR)[12], and areas within the OTR are treated, at a minimum as moderate nonattainment for ozone, the ozone precursors NOx and VOC are subject to the state's NNSR program requirements. *See* 40 CFR 51.166(i)(2). With Massachusetts being part of the OTR and considering the Dukes County nonattainment status, LAER is required if emissions of NOx or VOC from a project at a major source exceed Massachusetts's NNSR applicability thresholds of 50 tpy.

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[11] *See* 2011 PSD Memorandum of Understanding with EPA Region 1 at: https://www.epa.gov/caa-permitting/epa-massdep-prevention-significant-deterioration-psd-delegation-agreement

[12] In the CAA amendments of 1990, Congress created the OTR, located in the northeast portion of the country, to address ozone formation due to transport. Congress included all of Massachusetts as one of the states or commonwealths within the OTR.

A. Stationary Source Analysis and Determination

OCS permitting involves the interaction of CAA requirements specific to the OCS with other CAA permitting requirements. Determining what regulatory requirements apply requires defining the scope of these programs with respect to a given collection of activities. The permitting authority must determine: 1) whether an activity, facility, or equipment (including a vessel) is an OCS source; 2) the applicability of other state and federal requirements to the OCS source under 40 C.F.R. §§ 55.13 and 55.14 [13]; 3) the scope of pollutant-emitting activities that comprise the "stationary source" for NSR and "major source" for Title V purposes; and 4) the applicability of the NSR and Title V permitting requirements to the OCS source based on evaluation of the source's potential emissions. This section addresses Step 3, the scope of the "stationary source" and/or potential "major source" for NSR and Title V purposes[14], and EPA commonly refers to this analysis as a source determination. Steps 1 and 2 are addressed in Section III of this Fact Sheet and Step 4 is addressed in subsequent sections, Sections V and VI of this Fact Sheet. Note that this permit is an NSR permit containing PSD, NNSR, and minor NSR permit conditions and does not contain Title V requirements for the project. A Title V permit for the project may be issued at a later date if applicable, however, the scope of the "major source" analysis for Title V purposes will also be evaluated in this section as part of Step 3 in order to proceed with permitting in a clear and consistent manner.

The project is a major source of air pollution, and thus is subject to PSD and NNSR permitting requirements based on its PTE. For the NSR permitting programs, including PSD and NNSR, the EPA regulations define "stationary source" as "any building, structure, facility, or installation which emits or may emit a regulated NSR pollutant."[15] Those regulations, in turn, define the term "building, structure, facility, or installation" to mean "all of the pollutant-emitting activities which [1] belong to the same industrial grouping, [2] are located on one or more contiguous or adjacent properties, and [3] are under the control of the same person (or persons under common control)," with "same industrial grouping" referring to the same Major Group, two-digit SIC code. For the Title V permit program, "major source" is similarly defined in relevant part as a stationary source or group of stationary sources that meet these same three criteria.

State and local permitting authorities have EPA-approved NSR permitting regulations that contain identical or similar definitions of "major source" and "stationary source", including those in Massachusetts regulations incorporated by reference into the federal rules at 40 C.F.R. § 55.14: under the EPA-approved Massachusetts NNSR regulations at 310 CMR 7.00, Appendix A, and under the EPA-approved Massachusetts Title V operating permit regulations at 310 CMR

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[13] The provisions of 40 C.F.R. § 52.21, except paragraph (a)(1), are incorporated and made a part of the applicable state implementation plan for the State of Massachusetts. *See* 40 C.F.R. § 52.1165. These regulations were, in turn, incorporated into the part 55 regulations applicable to OCS sources within 25 nautical miles of seaward boundary of Massachusetts.

[14] As explained by the Environmental Appeals Board (EAB), "simply because EPA has identified an OCS source as regulated under the CAA, and subject to the requirements of part 55, does not mean it can avoid the next necessary step of determining the scope of the "stationary source" for PSD purposes." In re Shell Offshore Inc., 13 E.A.D. 357, 380 (Sept. 14, 2007).

[15] 40 C.F.R. § 52.21(b)(5); 40 C.F.R. § 51.165(a)(1)(i); 40 C.F.R. § 51.166(b)(5); *see* 42 U.S.C. § 7602(z) (defining "stationary source" as "any source of an air pollutant" except those emissions resulting directly from certain mobile sources or engines).

7.00, Appendix C, the "stationary source" and "major source" definitions are similar to those in the federal regulations.

During construction, pollutant-emitting activities from the windfarm include temporary diesel generators (i.e., engines) used to supply power to the WTGs and OSS during commissioning and engines on vessels that meet the definition of OCS source. During operations and maintenance, pollutant-emitting activities from the windfarm will include engines on vessels that meet the definition of an OCS source, as well as generators on the WTGs and generators on the OSS. Pollutant-emitting activities need to meet certain criteria in order to be considered part of the same stationary source: the activities need to have the same industrial grouping (two-digit SIC code Major Group)[16], the activities need to be located on contiguous or adjacent properties and the activities need to be under common control. For the Title V permit program, "major source" is similarly defined in relevant part as a stationary source or group of stationary sources that meet these same three criteria.[17] With one exception, not relevant here, the EPA's regulations do not define "adjacent," and also do not define "control" or "common control."

In the original promulgation of these three factors in the NSR program regulations, the EPA was mindful of the U.S. Court of Appeals for the District of Columbia Circuit's holding in *Alabama Power Co. v. Costle*.[18] In the Preamble to those 1980 PSD regulations, the EPA described what the phrase "building, structure, facility, or installation" means in the PSD context:

> In EPA's view, the December opinion of the court in *Alabama Power* sets the following boundaries on the definition for PSD purposes of the component terms of "source:" (1) it must carry out reasonably the purposes of PSD; (2) it must approximate a common sense notion of "plant;" (3) it must avoid aggregating pollutant-emitting activities that as a group would not fit within the ordinary meaning of "building," "structure," "facility," or "installation."

The EPA further explained that the three-part test (same industrial grouping, location on contiguous or adjacent property, and under common control) would satisfy this direction from the *Alabama Power* court decision by reasonably comporting with the "common sense notion of a plant," and by avoiding the aggregation of pollutant-emitting activities that would not fit within the ordinary meaning of "building, structure, facility or installation."[19] In so doing, the EPA considered but chose not to add a "functional interrelationship" factor or test to the criteria for defining a source, as at that time we believed that such a test would have "embroiled the agency

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[16] 40 C.F.R. § 52.21(b)(6); 40 C.F.R. § 51.165(a)(1)(ii); 40 C.F.R. § 51.166(b)(6).

[17] 40 C.F.R. § 70.2; 40 C.F.R. 71.2; see 42 U.S.C. § 7661(2) (defining major source for Title V permitting as "any stationary source (or any group of stationary sources located within a contiguous area and under common control)" that is either a major source as defined in CAA section 112 or a major stationary source as defined in CAA section 302 or part D of subchapter I (NNSR)). The EPA was also clear in promulgating its regulatory definitions of "major source" that the language and application of the Title V definitions were intended to be consistent with the language and application of the PSD definitions contained in 40 C.F.R. § 52.21 (61 FR 34210 (July 1, 1996)).

[18] *See* 45 FR 52676, 52694 (August 7, 1980) (citing *Alabama Power Co. v. Costle*, 636 F. 2d 323, 397 (D.C. Cir. 1979)).

[19] 45 FR at 52694.

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in numerous, fine-grained analyses."[20] In the same rulemaking, the EPA explicitly did not set a specific distance that would be considered too far apart for adjacency, stating such determinations must be made on a case-by-case basis.[21] However, the agency did explain that it did not intend that a single source include activities that were many miles apart, as may be the case, for instance, with multiple sources located along the same pipeline or transmission line.

State and local permitting authorities have EPA-approved NSR permitting regulations that contain identical or similar definitions for stationary and major source. Under the EPA-approved Massachusetts NNSR regulations at 310 CMR 7.00, Appendix A (incorporated by reference into the federal rules at 40 C.F.R. § 55.14), stationary source is defined as follows:

Stationary source means any building, structure, facility, or installation which emits or which may emit any air pollutant subject to regulation under the Act.

(a) A stationary source may consist of one or more emissions units and:

1. may be a land-based point or area source; or
2. may be located in, or on, the OCS or other submerged lands beneath navigable waters (lakes, rivers, and coastal waters adjacent to Outer Continental Shelf lands); or
3. may be any internal combustion engine, or engine combination, greater than 175 horsepower (hp) used for any stationary application; or
4. may be any internal combustion engine regulated under Sec. 111 (New Source Performance Standards (NSPS)) of the Act, regardless of size; or
5. may be any internal combustion engine of less than 175 horsepower (hp) not actually controlled to meet a regulation under Sec. 213 (Nonroad Engines and Vehicles) of the Act.

(b) A stationary source does not include:

1. emissions resulting directly from an internal combustion engine for transportation purposes; or
2. tailpipe emissions from any source regulated under title II of the Act or any emissions from in-transit, non-OCS marine vessels.

The Massachusetts NNSR regulations at 310 CMR 7.00, Appendix A define "building, structure, facility, or installation" as follows:

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[20] 45 FR at 52695. Instead, the EPA decided to use the SIC code as the criterion for aggregating activities on the basis of their functional interrelationships, to maximize the predictability and to minimize the difficulty of administering the definition. See id.

[21] 45 FR at 52695. Instead, the EPA decided to use the SIC code as the criterion for aggregating activities on the basis of their functional interrelationships, to maximize the predictability and to minimize the difficulty of administering the definition. See id.

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> "all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Any marine vessel is a part of a facility while docked at the facility. Any marine vessel is a part of an Outer Continental Shelf (OCS) source while docked at and within 25 nautical miles en route to and from the OCS source. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same Major Group (*i.e.*, which have the same two-digit code) as described in the *Standard Industrial Classification Manual*, 1987.

The Massachusetts Title V operating permit program regulations at 310 CMR 7.00, Appendix C defines a major source as follows:

> For the purpose of defining "major source," a stationary source or group of stationary sources shall be considered part of a single industrial grouping if all of the pollutant emitting activities at such source or group of sources on contiguous or adjacent properties belong to the same Major Group (*i.e.*, all have the same two-digit code) as described in the Standard Industrial Classification Manual, 1987.

Additionally, in 2019, EPA finalized the "adjacent" guidance in an effort to address uncertainty regarding the meaning of the term "adjacent" in the regulated community, as that term is used in the relevant definitions in EPA's NSR and Title V regulations.[22] In that guidance, EPA adopted an interpretation of "adjacent" that is based on physical proximity only for the purposes of determining permitting requirements for a single source. The guidance clarified that concept of "functional interrelatedness" will no longer be considered by EPA when determining whether activities are located on adjacent properties.

With the regulatory history, relevant regulatory definitions and recent guidance in mind, the three criteria to determine the scope of the stationary and major source for NSR and Title V purposes, evaluating whether pollutant-emitting activities, equipment or facilities [1] belong to the same industrial grouping, [2] are located on one or more contiguous or adjacent properties, and [3] are under common control, are evaluated for the project below.

Each of the windfarm's pollutant-emitting activities described above are classified under Standard Industrial Code (SIC) 4911, Electric Services. Accordingly, all pollutant emitting activities meet this criterion as they belong to the same Major Group.

All pollutant emitting activities from this project will be located on a single property. For a number of reasons, the EPA considers the WA—a portion of a lease held by SFW occupying a relatively small tract of otherwise open ocean, defined from its surroundings by the planned installation of a uniform and close-knit pattern of wind turbines—to fit reasonably within such a meaning of a "property" as "a place or location." First, although the WA occupies a relatively large area, this is necessarily somewhat unique to the large spatial scales associated with OCS

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[22] *See* the memo "Interpreting 'Adjacent' for New Source Review and Title V Source Determinations in All Industries Other Than Oil and Gas" at https://www.epa.gov/sites/production/files/2019-12/documents/adjacent_guidance.pdf

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windfarm development projects.[23] Viewed in context, the WA is a relatively small property when compared to the area set aside for future development by the offshore wind industry off the coast of Massachusetts, and an even smaller property when compared to the OCS and surrounding open ocean more broadly. Second, the WA is a discrete and clearly identifiable area set apart from the surrounding open ocean by its man-made features. One could not approach or pass through the WA and its towering grid of wind turbines without recognizing that it was a fundamentally different "place" than the open ocean surrounding it on four sides. *See* Figure 1.

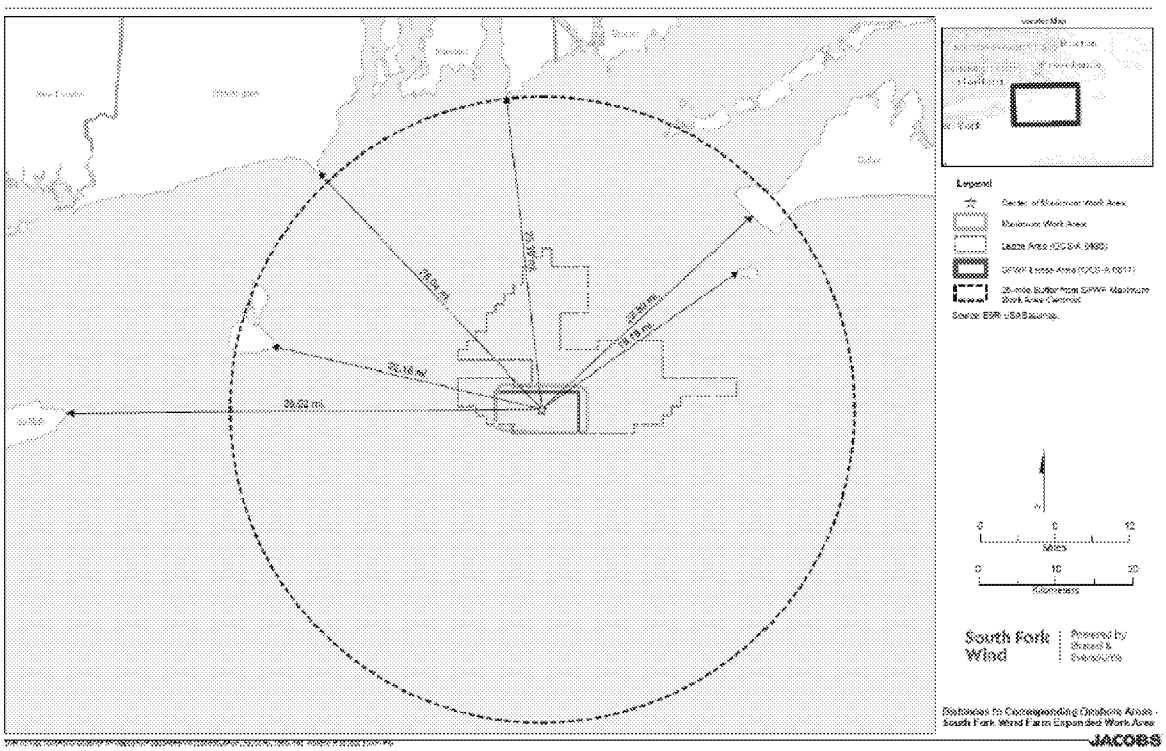

Figure 1. Diagram of project work area in relation to nearby landmasses

The pollutant emitting activities considered part of the OCS source are also either touching or in close proximity to the property of the WA and considered in the unique context of the offshore wind industry and the geographic scale of the OCS.[24,25]

Regarding the common control criterion, EPA's policy is to focus on one entity's power or authority to dictate decisions that could affect the applicability of, or compliance with, relevant

[23] Offshore windfarms require some degree of spacing between turbines, resulting in a single facility or installation covering a relatively large property. This spacing is necessary to balance navigational concerns, wind energy generation, and impacts to other resources such as marine mammals, recreational fishing and boating, and commercial marine fisheries.

[24] The collection of pollutant emitting activities in the WA would also be viewed as contiguous or adjacent but a detailed analysis on adjacency is not included here as the activities already clearly occur on a single distinct property and thus are already part of a single source.

[25] Please note that Figure 1 includes distances in statute miles rather than nautical miles.

air pollution regulatory requirements.[26] Analyzing the facts under this framework, the EPA's understanding is that SFW has the relevant power or authority over all pollutant-emitting activities, including the authority to dictate decisions of third-party contractors. SFW will own and operate the facility consisting of WTGs, OSS, and vessels meeting the definition of an OCS source. SFW will likely not own other pollutant-emitting activities that are part of the windfarm such as third-party vessels and construction equipment contracted to perform specialized construction and maintenance activities. However, SFW is the responsible entity for contracting the third-party vessels used for construction and maintenance activities. As part of the contracting process, SFW also has the authority to impose requirements on the activities of third-party contractors, including requirements relating to the emissions generating equipment employed by those contractors that could affect compliance with air permitting requirements.

The pollutant-emitting activities in the WA are part of a single, overall project occupying a discrete and well-defined area that meets the "common sense notion of a plant" and can be reasonably viewed as a single "installation" or "facility," thereby fitting within the ordinary meaning of one of the four permissible regulatory terms per *Alabama Power*. EPA has determined pollutant-emitting activities from the windfarm from generators on the WTGs and OSS, and engines on vessels that meet the definition of an OCS source during construction and operation phases of the project will be considered one stationary source for permitting purposes.[27]

B. Wind Turbine Generators and Offshore Substation

WTGs and the OSS will be installed on the seabed within the WA facility. The EPA has determined that the collection of WTGs, the OSS, as well as the vessels operating as OCS sources constitute a single stationary source consistent with the term "major stationary source" as that term is used in the PSD and NNSR programs.

C. Vessels

SFW identifies the following vessels with air pollutant emitting equipment in the revised application.

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[26] *See* Letter from William L. Wehrum, Assistant Administrator, EPA Office of Air and Radiation, to the Honorable Patrick McDonnell, Secretary, Pennsylvania Department of Environmental Protection (April 30, 2018), available at https://www.epa.gov/sites/production/files/2018-05/documents/meadowbrook_2018.pdf.

[27] This source determination and supporting analysis applies only to this source. Source determinations are made by permitting authorities on a source-specific, case-by-case basis. Sources should consult with the appropriate permitting authority with any questions about specific permitting requirements for their activities.

Table 3. Types of Vessels and Equipment for WTG and OSS Installation Activities included in the Emissions Inventory

Floating/Jack-up Vessels or Barges
Towing Tug
Material Barge
Anchor Handling Tug
Crew Transport Vessel
Support Vessel/Inflatable Boats
Feeder Barge: Monco 335
Rock-dumping (scour protection) Vessel (Monopile)
Fuel Bunkering Vessel

However, not all vessels used as part of the installation activities listed above in Table 3 meet the definition of an OCS source. The following subsections describe significant categories of vessels and how their operations related to the definition of an OCS source and, for OCS sources, the stationary source aspects of those vessels which will be subject to permitting requirements.

1. Jack-up vessels or barges

A jack-up vessel meets the first part of the definition of an OCS source because it will be performing an activity (i.e., constructing WTGs or OSS) that meets all three of the following criteria:

1. The diesel-fired or gasoline-fired generating sets will emit air pollutants.
2. BOEM will approve, disapprove, or approve with modifications a construction and operation plan that allows the jack-up vessel to construct the WTGs and OSS thus demonstrating the windfarm is authorized under the OCSLA (43 U.S.C. § 1331 et seq.); and
3. The jack-up vessel will be located on the OCS or in or on waters above the OCS.

Since the jack-up vessel is a vessel, it must meet one of the two criteria for a vessel to be considered an OCS source and thus be included as part of the OCS source that is covered in this permit (i.e., the WA facility). The EPA considers a jack-up vessel to meet the definition of an OCS source once three of the jack-up vessel's legs have attached to the seafloor, because the jack-up unit has become stationary at this point and is no longer operating as a vessel or a barge. Once that occurs, the jack-up vessel is "erected" on the seabed since the vessel will not be using its engines to maneuver itself at that time and it is located in a position according to a plan to conduct OCS activities, i.e., to participate in the exploration, production or development of resources from the seabed. From that point forward, the jack-up vessel's activity and emissions equipment involve developing or producing resources from the seabed by erecting a WTG on the seabed that will convert wind energy into electricity or an OSS to convey this electricity to shore. Once a jack-up vessel becomes an OCS source, all emission units on the jack-up vessel (including the construction equipment) are subject to the applicable terms and conditions of the permit. At the conclusion of the jack-up vessel's construction activities at a given location in the WA facility, the construction equipment ceases operating and the jack-up legs are raised from

the seafloor. The jack-up vessel's stationary source activities thereon remain regulated as part of the OCS source, and subject to the term and conditions of the permit, until the point in time when fewer than three jack-up legs are attached to the seafloor. Once the jack-up vessel is no longer attached to the seabed and no longer erected thereon for the purpose of exploration, production or development of resources from the seabed, it returns to its status as a vessel and is no longer subject to the stationary source requirements of part 55. However, the jack-up barge and its associated emission units are still included in the potential emissions calculations for the project at all times when such vessel is within 25 nautical miles of the WA facility and these emissions are subject to the permit's recordkeeping and NNSR offset requirements. The jack-up vessel is only subject to the specific emissions limits during the time it meets the definition of an OCS source (is attached to the seabed, erected thereon and used for the purpose of producing, exploring or developing resources from the seabed) and thus is regulated as a stationary source under part 55.

2. Cable-laying vessels

Two different vessels will be used to lay the inter-array cables in the WA facility and the export cable: 1) vessels using pull-ahead anchors[28] and 2) vessels using a dynamic positioning system (DPS)[29]. In either cable laying operation, the seafloor will be prepared and cleared of boulders using specialized work vessels, the cable will be laid along the route using CLVs, and a tool to bury cable may be used during cable-laying or after in order to provide secondary protection for areas that don't meet the target depth. Using different cable laying vessels is necessary because in shallower waters of less than 35 ft depth or in areas where the seabed substrate is more firm, thrusters on the vessels cannot be engaged to position the vessel to the same extent and therefore using the pull-ahead anchor to attach to the seabed to maintain the vessel position becomes more important. Vessels will not use pull-ahead anchors to lay the inter-array cables because the anchor could compromise the integrity of nearby structures such as the wind turbine foundations. However, cable-laying vessels, utilizing pull-ahead anchors, will not be considered part of the OCS source in this permitting action.[30] The emissions from these vessels will, however, be included in the PTE of the OCS source when located at or traveling within 25 nautical miles of the centroid of the WA. A detailed discussion of OCS source applicability for pull-ahead anchor CLVs is provided below.

EPA has previously considered pull-ahead anchor CLVs to be OCS sources for purposes of OCS permitting.[31] A permit applicant for a previous OCS project (Vineyard Wind) proposed to treat pull-ahead anchor CLVs as OCS sources in its application primarily because the CLVs

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[28] Orsted, the parent company developing SFW, proposed in its OCS NSR permit application that the [pull-ahead] anchors will be regularly used for propulsion purposes to help the vessel pull cable-laying equipment (such as a jet plow) along the export cable-laying route.

[29] Orsted described DPS in its permit application and a September 30, 2020 letter to EPA as a system that "uses computer-controlled thrusters to maintain position along the cable route, and the ship's forward momentum comes from its own on-board propulsion, not winches and anchors." The letter is further described in the next page and in this letter Orsted concluded that DPS are not attached to the seabed.

[30] This proposed determination is exclusively for pull-ahead anchor CLVs that lay offshore cable, not any other type of vessels that might operate in the OCS and could be classified as an OCS source for purposes of CAA permitting.

[31] See OCS air permits for Vineyard Wind 1, LLC (#OCS_R1-03), and Cape Wind Associates, LLC (#OCS-R1-01), available online at https://www.epa.gov/caa-permitting/epa-issued-caa-permits-region-1.

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temporarily attach to the seabed, which is one of the requirements for vessels to be considered OCS sources under 40 C.F.R. § 55.2. EPA proposed the draft permit for comment consistent with the permit application and did not receive adverse comments on this permitting approach for treating pull-ahead anchor CLVs as OCS sources. However, in separate communication with EPA, Orsted, the parent company developing the SFW windfarm, has questioned whether pull-ahead anchor CLVs should be considered OCS sources. The September 30, 2020, SFW permit application includes analyses on PTE and source applicability when considering anchored CLVs as both OCS sources and non-OCS sources. In addition, Orsted submitted a letter (Orsted letter) on September 30, 2020 to EPA[32] providing arguments as to why pull-ahead anchor CLVs should not be considered OCS sources.

In response to this application and the Orsted letter, EPA reevaluated this issue. In the context of the Vineyard Wind permit, and consistent with Vineyard Wind's application, EPA focused mainly on whether the CLVs were attached to the seabed. For the reasons explained below and in light of new information, EPA agrees with Orsted that pull-ahead anchor CLVs are not OCS sources and, therefore, need not be subject to the permitting requirements applicable to OCS sources.

As explained previously in Section III.A. of this Fact Sheet, CAA Section 328 defines an OCS source as "any equipment, activity, or facility which: (1) emits or has the potential to emit any air pollutant; (2) is regulated or authorized under the Outer Continental Shelf Lands Act ("OCSLA") (43 U.S.C. § 1331 et seq.); and (3) is located on the OCS or in or on waters above the OCS." 42 U.S.C. § 7627(a)(4)(C). Such activities "include, but are not limited to, platform and drill ship exploration, construction, development, production, processing, and transportation." *Id.*
The OCS regulations, at 40 C.F.R. § 55.2, define an OCS source by first incorporating the statutory language referenced previously and then adding that vessels are considered OCS sources only when they meet one of the following criteria: (1) the vessel is "[p]ermanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, within the meaning of section 4(a)(1) of OCSLA (43 U.S.C. § 1331 et seq.)[33];" or (2) the vessel is "[p]hysically attached to an OCS source, in which case only the stationary source aspects of the vessels will be regulated."
Thus, for a pull-ahead anchor CLVs to be considered an OCS source, it must meet the three statutory criteria of the OCS source definition and one of the two additional criteria in the portion of the regulatory OCS source definition that specifically applies to vessels. In the September 30, 2020 letter, Orsted first argues that "CLVs utilizing [pull-ahead] anchors for propulsion fail to meet the OCS source definition criteria that a vessel be: (1) "permanently or temporarily attached to the seabed;" (2) "erected thereon;" and (3) "used for the purpose of exploring or producing resources therefrom" because "these vessels are in continual motion and use pull-ahead anchors

[32] Letter from Stephen C. Fotis, Counsel for Orsted Wind Power North America LLC to Anne Austin, Former Principal Deputy Administrator for the Office of Air and Radiation (OAR) regarding "Treatment of Offshore Cable-Laying Vessel Activities under the 40 C.F.R. Part 55, Outer Continental Shelf Air Regulations." A copy of the letter can be found in the docket for this action.
[33] 40 C.F.R. § 55.2 references section (4)(a)(1) of OCSLA, which states in relevant part that laws of the United States are "extended to the subsoil and seabed of the outer Continental Shelf and to all artificial islands, and all installations and other devices permanently or temporarily attached to the seabed, which may be erected thereon for the purpose of exploring for, developing, or producing resources, including non-mineral energy resources, therefrom." 43 U.S.C. § 1333(a)(1).

for propulsion purposes, not for staying fixed in one place or being continuously attached to the sea floor for any meaningful period." Second, Orsted argues that "even if such activities were subject to OCS NSR regulation, those vessel activities—which can stretch for many dozens of miles along a linear route—should be aggregated with the primary OCS source activity for the development of the wind farm." Third, Orsted argues that "for purposes of modeling and for determining the potential to emit, the geographic boundaries should be limited to 25 miles of the centroid of the WA."

EPA reviewed Orsted's arguments and is not persuaded that pull-ahead anchor CLVs are not "attached to the seabed." However, EPA agrees that pull-ahead anchor CLVs are not "erected" thereon and used "for the purpose of exploring, developing, or producing resources" as explained below. Therefore, in this draft permit, EPA proposes not to regulate pull-ahead anchor CLVs as OCS sources subject to OCS permitting requirements. The EPA did not evaluate the other claims made in the letter from Orsted to EPA regarding how to treat CLVs if they were to be regulated under CAA Section 328 and OCS implementing regulations at 40 CFR Part 55.

Regarding DPS vessels used exclusively to lay offshore cables, the EPA understands that such DPS vessels may not be permanently or temporarily attached to the seabed. Therefore, it could be argued that such DPS vessels are not OCS sources only on that basis. Notwithstanding that, the EPA is also proposing to consider such DPS vessels as neither being erected thereon nor used for the purpose of exploring, developing or producing resources therefrom similar to our position explained further below in the context of pull-ahead anchor CLVs discussion. The EPA requests comments on this proposed approach for addressing such DPS vessels.

i. Pull-ahead anchor CLVs are temporarily attached to the seabed

In the context of the recently issued Vineyard Wind 1 permit, and consistent with Vineyard Wind's application, the EPA had agreed that pull-ahead anchor CLVs are temporarily attached to the seabed and therefore OCS sources by focusing mainly on whether the CLVs were attached to the seabed.. For this SFW permit, the EPA has re-evaluated all of the criteria in EPA regulations that determine whether a vessel meets the definition of an OCS source, including Environmental Appeals Board (EAB) decisions interpreting the OCS source definitions in CAA Section 328 and the 40 CFR Part 55 regulations. Based on this detailed review, in this draft permit, EPA proposes to determine that pull-ahead anchor CLVs are not OCS sources. While pull-ahead anchor CLVs meet the "attached" to the seabed criterion as explained in this section, pull-ahead anchor CLVs do not meet the other regulatory criteria of being "erected" thereon and used "for the purpose of exploring, developing, or producing resources."

The EAB has recognized that "attachment" for purposes of being an OCS source is not ordinarily "so broad" to mean "any physical connection." *In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 193, 199 (E.A.B. 2011) ("*Shell 2011*"). However, in another case, the EAB affirmed Region 10's determination that a drill ship satisfies the requirement of being "attached to" the seabed when one of its anchors is deployed. *In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 470, 488 (E.A.B. 2012) ("*Shell 2012*"). Because pull-ahead anchor CLVs deploy an anchor that connects to the seabed, pull-ahead anchor CLVs are similarly attached to the seabed and satisfy this requirement. Also, in *Shell 2011*, EPA Region 10 determined an icebreaker vessel is not "attached" to a drill ship when the icebreaker is setting or receiving the drill ship's anchors. *Shell 2011* at 194. In

making this determination, EPA Region 10 defined the purpose of "attachment" as to "prevent or minimize relative movement" between the vessel and the seabed. *Id.* at 199. Region 10 determined that the icebreaker is not "attached" to the drill ship sufficient to constitute being an OCS source because the icebreaker's anchor cable is "repeatedly connected and disconnected" from one of the drill ship's anchors, and is "not intended in any way to restrict the location of" the icebreaker. *Id.* at 200. In finding Region 10's definition of "attachment" to be reasonable, the EAB also noted the anchor cable is "played out" as the icebreaker travels away from the drill ship, meaning the anchor cable is not intended to restrict the location of the icebreaker. *Id.* The EAB compared the intermittent connection of the icebreaker vessel to the drill ship to a vessel at dockside, noting that "attachment" in the context of an OCS source is more similar to the latter. *Id.* at 200. Here, pull-ahead anchor CLVs use anchors for propulsion to stabilize the CLVs as they move across the OCS, which means the anchor that connects the CLVs to the seabed is used to "prevent or minimize relative movement" of the CLV to keep it on the correct trajectory to lay cable, and further "restricts the location" of the CLV during its cable laying process. Also, because the anchor cable is used as propulsion for the CLV, the anchor cable is not "played out," but is instead tight as the CLV is pulled across the OCS. In its letter, Orsted stated one of the purposes of the use of CLVs is to maintain position along a linear route. *See* Orsted letter at 5. Therefore, pull-ahead anchor CLVs satisfy the requirement of being "attached" to the seabed.

In its letter, Orsted argues that the CLVs are not "attached to the seabed" because they are not "secure and stable in a position to commence exploratory activities." *See* Orsted letter at 6. Orsted cites to the EAB decision in *In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 103 (E.A.B. 2010) ("*Shell 2010*") to make this claim. In *Shell 2010*, in the context of whether a drill ship was an OCS source, EPA Region 10 defined an OCS source as being "secure and stable in a position to commence exploratory activities." *Shell 2010* at 135. However, this is not the holding in the cited EAB decision, but rather the underlying reasoning of Region 10 that the EAB reviewed and found unpersuasive. The EAB remanded for Region 10 to reconsider this reasoning, so there is no EAB precedent supporting the interpretation Orsted articulates in its letter. Therefore, EPA considers pull-ahead anchor CLVs to be attached to the seabed.

ii. Pull-ahead anchor CLVs are not erected on the seabed

In another EAB decision *In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 470, 488 (E.A.B. 2012) ("*Shell 2012*"), the EAB found reasonable Region 10's definition of "erected thereon" as "intended to reflect the process by which a vessel becomes attached to the seabed and used thereafter for the purpose of exploring, developing, or producing resources from the seabed." *Shell 2012* at 491. EPA supported this definition by looking to the customary meaning of the verb "to erect," which is defined as "to construct" or "to build," and thus reasoned that attachment to the seabed must occur "at the location where OCS activity is reasonably expected to occur." *Id.* Pull-ahead anchor CLVs are neither constructed nor built on the seabed but are instead pulled along an anchor line. The phrase "erected thereon" for the purposes of an OCS source definition requires a more secure, stationary activity than cable laying. When a drillship is "erected" on the seabed, it remains stationary while it conducts its OCS activity, and is at the location where the OCS activity (e.g., exploratory drilling) is reasonably expected to occur. Conversely, pull-ahead anchor CLVs do not remain stationary at the location of the OCS activity (i.e., generation of power), and are more akin to mobile sources. Also, the pull-ahead anchors CLV activity may

occur a significant distance away from the wind farm where the OCS activity is located. Moreover, the regulations use the term "erected" in the past tense, indicating that a structure is completed and stationary. Therefore, pull-ahead anchor CLVs do not meet the criteria of being "erected" on the seabed, and are thus not OCS sources.

Applying language in OCSLA that is similar to that in EPA's Part 55 regulation, the Eastern District of Texas also found that a research vessel equipped with drilling equipment that anchored to the seabed was not "erected" on the seabed so as to render it a "situs." *Cunningham v. Offshore Specialty Fabricators, Inc.*, No. 5:04-CV-282, 2010 WL 11628021 (E.D. Tex. Aug. 17, 2010). The U.S. Supreme Court and the Fifth Circuit have read Section 4(a)(1) of OCSLA as creating a "situs" requirement for the application of other sections of OCSLA. *See Offshore Logistics, Inc. v. Tallentire*, 477 U.S. 207, 217-20 & 220 n.2 (1986); *Mills v. Director, OWCP*, 877 F.2d 356, 361-62 (5th Cir. 1989). An area that meets the requirements of a "situs" becomes subject to the criminal and civil laws of each adjacent State, which are treated to be the law of the United States as applied to that particular "situs." *Demette v. Falcon Drilling Co.*, 280 F.2d 492, 497 (5th Cir. 2002). Because prior court opinions had not parsed the precise language of the statute to specify what exactly an OCSLA "situs" requires, the court in *Demette* explained an OCSLA "situs" applies to "all artificial islands, and all installations and other devices permanently attached to the seabed," including those artificial islands, installations, or devices "erected" on the OCS "for the purpose of exploring for, developing, or producing resources" from the OCS. *Id.* at 496. This language is similar to the language in CAA Section 328 defining an OCS source, and we are looking to such case law to give meaning to similar language in the CAA and the Part 55 regulations. The court's reasoning in *Cunningham* does not distinguish between "attached" and "erected," but instead explains the vessel is not "erected" because it is not sufficiently attached to the seabed. *Id.* The court further explained that the plaintiff had not shown how the presence of drilling equipment on board the vessel provided any greater attachment for purposes of OCSLA and had provided no evidence as to how the drilling equipment on the vessel interacted with the OCS. *Id.* Like in *Cunningham*, the fact that the CLV is anchored to the seafloor is alone insufficient to make the CLV an OCS source, and using anchors and pull-ahead winches for locomotion does not constitute being "erected" on the seabed sufficient to make the pull-ahead anchor CLV an OCS source.[34]

iii. Pull-ahead anchor CLVs are not used for the purpose of exploring, developing, or producing resources

The terms "exploring," "developing," and "producing," as defined in OCSLA, do not include construction other than platform construction. Under 40 C.F.R. § 55.2, a vessel may be an OCS source when it meets other criteria and is "used for the purpose of exploring, developing or producing resources" from the seabed, "*within the meaning of section 4(a)(1) of OCSLA* (43 U.S.C. § 1331 et seq.)" (emphasis added). Under OCSLA, the term "exploration" is defined as "the process of searching for minerals, including (1) geophysical surveys . . . and (2) any drilling." 43 U.S.C. § 1331(k). "[D]evelopment" is defined as an activity taking place "following

[34] There is nothing in the legislative history for either the CAA or OCSLA discussing "erected," nor is there any indication in the OCS regulations that the source criteria should be interpreted in any way differently than OCSLA § 4(a)(1). *See Shell 2012* at 491.

discovery of minerals in paying quantities, including geophysical activity, drilling, platform construction, and operation of all onshore support facilities, and which are for the purpose of ultimately producing the minerals discovered." *Id.* § 1331(l). "[P]roduction" means an activity taking place "after the successful completion of any means for the removal of minerals, including such removal, field operations, transfer of minerals to shore, operation monitoring, maintenance, and work-over drilling." *Id.* § 1331(m). These three definitions specifically refer to minerals, which could be interpreted to mean that OCSLA only applies to mineral resources, thereby excluding wind resources. However, Section 4(a)(1) of OCSLA was amended in January 2021 to include "non-mineral resources" in its definition, so the above definitions include wind resources as well as minerals. *See* William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, H.R. 6395, 116th Cong. § 9503 (2021). However, pull-ahead anchor CLVs do not satisfy the requirement of "exploring, developing or producing resources" from the seabed because the only time the term "construction" is used in these definitions is in the context of "platform construction" and pull-ahead anchor CLVs do not contribute to platform construction, and no other type of construction is implicated in these definitions. Furthermore, the Western District of Louisiana has analyzed OCSLA to determine whether OCSLA applies to a DPS vessel that attaches to the seabed via suction pile[35] and lays pipeline on the OCS. *Global Industries Offshore LLC v. Pipeliners Local Union 798*, No. Civ.A. 04-1249, 2006 WL724815 (W.D. La. Mar. 16, 2006). The issue of whether OCSLA applies to a particular vessel is relevant to whether CLVs are OCS sources under the CAA because Part 55 uses language from OCSLA as its criteria for a vessel being an OCS source. Part 55 also indicates that EPA should apply this language consistent with how it is interpreted in OCSLA. Under Part 55, a vessel is an OCS source when the vessel is "[p]ermanently or temporarily attached to the seabed and erected thereon and used for the purpose of exploring, developing or producing resources therefrom, *within the meaning of section 4(a)(1) of OCSLA* (43 U.S.C. § 1331 et seq.)." 40 C.F.R. § 55.2 (emphasis added). OCSLA extends federal law to "the subsoil and seabed of the outer Continental Shelf and to all artificial islands, and all installations and other devices *permanently or temporarily attached to the seabed, which may be erected thereon for the purpose of exploring for, developing, or producing resources therefrom* . . . ." 43 U.S.C. § 1333(a)(1) (emphasis added).

In *Global Industries*, the court determined OCSLA does not apply to a DPS vessel that attaches to the seabed via suction pile and lays pipeline on the OCS because pipelaying is not "exploration, development or production of resources" under OCSLA. *Global Industries* at *4. Given the "lack of jurisprudence" in the area, the court deferred to a U.S. Customs and Border Protection ("CBP") ruling letter, which was issued to determine whether federal coastwise trade law prohibited a vessel from transporting a diving bell, its equipment, and divers from a coastwise point to the OCS to support diving operations from a stationary, unanchored position. Customs Letter Ruling 109576. In so doing, the CBP addressed whether the vessel was subject to OCSLA because OCSLA extends federal law to the OCS. *Id.* The CBP determined the research vessel at issue was not subject to OCSLA because it would not be "tethered or anchored in any

[35] A suction pile is a long steel cylinder topped with a pile top or cap, which comprises valves to assist with embedment to the sea floor. Suction piles can be deployed as deep mooring anchors and foundations for subsea infrastructure and operate by using suction to embed into the sea floor.
(Information taken from InterMoor website page titled "How Do Suction Piles Work?" available at https://intermoor.com/press-releases/how-suction-piles-work/).

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way to the seabed" and the diving bell would not "engage in any extraction, exploration, or production operations." *Id.* The *Global Industries* court used this reasoning to find that the pipelaying vessel at issue was not subject to OCSLA because DPS vessels that are used for "pipe laying purposes and not for the purpose of 'exploring for, developing, or producing resources' do not fall under the provisions of the OCSLA." *Global Industries* at *4. Pipelaying vessels provide a similar function as CLVs laying cable in the OCS, and the *Global Industries* court found pipelaying does not constitute engaging in "extraction, exploration, or production" of resources under OCSLA. Also, even though the pipelaying vessel was connected to the seabed via a suction pile, the court determined it was not subject to OCSLA. Therefore, even though CLVs are connected to the seabed via an anchor, CLVs should similarly not be considered "exploring for, developing, or producing resources" given that cable laying is similar to pipe laying.

3. Support and other vessels

In addition to jack-up vessels, other types of vessels may meet the definition of an OCS source at some point during the construction or operations phase of the project.

These vessels meet the first part of the definition of an OCS source because the vessels will be performing an activity (i.e., supporting the construction or operations of a WTG or OSS) and will meet all three of the following criteria:

1. The gasoline or diesel-powered engines on the vessels will emit air pollutants.
2. BOEM will approve, disapprove, or approve with modifications a construction and operation plan that allows vessels to support the construction of the WTGs and OSS and authorizes a right-of-way for the cable, thus demonstrating the windfarm is authorized under the OCSLA (43 U.S.C. § 1331 et seq.); and
3. The vessels will be operating on the OCS or in waters above the OCS.

As stated earlier in this section, the definition of an OCS source in 40 C.F.R. part 55 has further criteria that must be met before a vessel can be considered an OCS source. Servicing fleet vessels used in the windfarm may temporarily attach to a structure that is an OCS source, another vessel that meets the definition of an OCS source, or to the seabed itself and otherwise be erected thereon (the seabed) and used for the purpose of exploring, developing or producing resources therefrom. The criteria within the definition of an OCS source for when a vessel becomes an OCS source depends on how a vessel is, in essence, remaining stationary on the OCS (i.e., attaches itself to an existing OCS source or to the seabed and is also erected thereon and used for the purpose of exploring, developing or producing resources therefrom). For service fleet vessels attached to an OCS source, only the stationary source activity occurring on the vessel will be regulated by permit conditions. The EPA has determined that all air emission units on a service fleet vessel, while that vessel meets the definition of an OCS source, constitute a stationary source activity because the vessel will be stationary and the reason for the vessel to be on the waters above the OCS is to assist in the construction of a stationary source, i.e., a WTG or an OSS.

For service fleet vessels that do not attach to an OCS source, but temporarily or permanently attach to the seabed, the service fleet vessel will be considered an OCS source when it is erected

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on the seabed and is used for the purpose of exploring, developing or producing resources from the seabed.[36] Like the jack-up vessels, the criteria "erected thereon" is met when in the WA facility the service fleet vessel attaches itself to the seabed and is in a location where it can reasonably be expected to conduct OCS activities; thus becoming stationary and used thereafter for the purpose of exploring, developing, or producing resources from the seabed like constructing a WTG or OSS. From that point forward, the service fleet vessel's operations and emissions are related to developing or producing resources from the seabed by erecting a WTG or the OSS on the seabed that will convert wind energy into electricity.

4. Crew transfer vessels

At least one crew transport vessel will be needed daily during both the construction and operational phases. During the operation and maintenance (O&M) phase, typically only crew transfer vessels and/or support vessels/inflatable boats will be used, unless a major repair is needed. For major repairs to heavy components, jack-up or crane barges may be required. Crew transfer vessels will be subject to permit requirements when they meet the definition of an OCS source.

V. Prevention of Significant Deterioration Requirements

Once a source locating on the OCS is determined to be subject to PSD, the EPA must then determine the emission units that are part of the major stationary source associated with the project. This principle of using the definition within the specific CAA program is articulated in an Environmental Appeals Board (EAB) Decision *In Re Shell Offshore, Inc., Kulluk Drilling Unit and Frontier Discoverer Drilling Unit*, 13 E.A.D. 357, 380 (EAB 2007). The EAB stated in that decision:

> "We find that the Region correctly concluded that, once it determines an emissions source located on the OCS is properly classified as an "OCS source," then that emissions source becomes subject to the requirements of 40 C.F.R. part 55. Further, the permitting programs and other requirements to which the OCS source is subject through part 55, including the PSD permitting program, then apply to the OCS source based on the regulations that define the scope of those programs. Specifically, simply because EPA has identified an OCS source as regulated under the CAA, and subject to the requirements of part 55, does not mean it can avoid the next necessary step of determining the scope of the "stationary source" for PSD purposes."

In accordance with the principle articulated in the decision quoted above, the EPA must determine the PSD regulations that apply to the windfarm based on the regulations that define the scope of the Clean Air Act program in question. Since all OCS sources are stationary, the EPA considers engines on a vessel are stationary sources and not nonroad engines when the engines are operating while the vessel meets the definition of an OCS source. The EPA also considers all air polluting devices located on a WTG or the OSS to be stationary sources. The OCS source definition in Section 328(a)(4)(C) of the CAA states that the OCS source includes

[36] The emission units on the service fleet vessel are still subject to the permit's NNSR offset requirements once the service fleet vessel is no longer meeting the criteria for an OCS source.

"any equipment, activity, or facility which – emits or has the potential to emit any air pollutant." Furthermore, CAA section 328(a)(4)(D) defines the term "new OCS source" to mean "an OCS source which is a new source within the meaning of section [111(a)] of [the CAA]." Inherent in the definition of "new source" under Section 111 is that the source to be regulated is a stationary source. *See* Section 111(a)(2) of the CAA.

Moreover, the regulatory definition of OCS source in 40 C.F.R. § 55.2 provides that, for vessels physically attached to an OCS facility, "only the stationary sources [sic] aspects of the vessels will be regulated." *See* 40 C.F.R. § 55.2 (definition of OCS source). For these types of OCS source-vessels, the "stationary source aspects" of the vessel attached to an OCS source are regulated by the permit beyond inclusion of its emissions (within 25 nautical miles of the OCS source) counting as direct emissions from the OCS source for purposes of determining potential emissions. In other words, the nonroad engines on the vessels will be subject to specific permit conditions, and its operations emissions *and* to-and-fro vessels emissions within 25 nautical miles of the OCS source will count as direct emissions from the OCS source for determining the PTE of the source. Section 328 of the CAA requires that emission units on OCS sources be regulated as stationary sources except with respect to emissions from engines being used for propulsion of vessels while attached to an OCS source.

Consideration of the emission sources on a typical vessel that is determined to be an OCS source makes clear that neither Congress nor EPA could have intended to exclude otherwise nonroad engines from regulation as stationary sources if part of an OCS source. Congress's specific grant of authority to EPA in the 1990 CAA amendments to regulate OCS sources would be rendered meaningless if emissions from engines that would otherwise be considered nonroad engines and that comprise the emission units on the vessels were excluded from regulation as stationary sources.

Given that an engine is a stationary source when located on an OCS source for purposes of Section 111 of the CAA, it is only logical to determine that these same engines are stationary sources for purposes of other CAA programs, including the PSD permit program.

A. Applicability

The PSD program, as set forth in 40 C.F.R. § 52.21 (PSD regulations), is incorporated by reference into the OCS Air Regulations at 40 C.F.R. § 55.13(d)(1) for OCS sources located within 25 nautical miles of a state's seaward boundary if the requirements of 40 C.F.R. § 52.21 are in effect in the COA. The EPA has determined that the requirements of sections 160 through 165 of the Clean Air Act (the authority for the PSD program) are not met in Massachusetts law; therefore, the provisions of 40 C.F.R. § 52.21, except paragraph (a)(1), are incorporated and made a part of the applicable state implementation plan for the Commonwealth of Massachusetts. *See* 40 C.F.R. § 52.1165. Therefore, 40 C.F.R. § 52.21 is in effect in the COA for this windfarm.

Under the PSD regulations, a stationary source is "major" if, among other things, it emits or has a PTE of 100 tpy or more of a "regulated NSR pollutant" as defined in 40 C.F.R. § 52.21(b)(50); is "subject to regulation" as defined in 40 C.F.R. § 52.21(b)(49); and is one of a named list of

source categories. Any other stationary source, i.e., one that is not on a list of named source categories, is also considered a major stationary source if it emits or has a PTE of 250 tpy or more of a "regulated NSR pollutant" and is "subject to regulation." *See* 40 C.F.R. §52.21(b)(l). The windfarm does not belong to a named source category; therefore, a PTE of 250 tpy of a "regulated NSR pollutant" is the threshold for determining PSD applicability.

"Potential to emit" is defined as the maximum capacity of a source to emit a pollutant under its physical and operational design. *See* 40 C.F.R. § 52.21(b)(4). In the case of "potential emissions" from the OCS source, 40 C.F.R. part 55 defines the term similarly, but also adds that:

> "Pursuant to section 328 of the Act, emissions from vessels servicing or associated with an OCS source shall be considered direct emissions from such a source while at the source, and while on route to or from the source when within 25 miles of the source, and shall be included in the "potential to emit" for an OCS source. This definition does not alter or affect the use of this term for any other purposes under 40 C.F.R. §§ 55.13 or 55.14 of this part, except that vessel emissions must be included in the "potential to emit" as used in 40 C.F.R. §§ 55.13 or 55.14 of this part. (40 C.F.R. § 55.2)"

Thus, emissions from vessels servicing or associated with an OCS source that are within 25 nautical miles of the OCS source are considered in determining the PTE or "potential emissions" of the OCS source for purposes of applying the PSD regulations.

For assessing PSD applicability for the project, EPA sums emissions from the equipment or activities considered part of the OCS source and all emissions from vessels servicing or associated with the project. This will include emissions from vessels, regardless of whether the vessel itself meets the definition of an OCS source, when the vessels are at or going to or from an OCS source and are within 25 nautical miles of the center, or centroid, of the source.

The project is a new major PSD source because emissions for at least one "regulated NSR pollutant" (i.e., NOx) exceeds the major source applicability threshold of 250 tpy. For major PSD sources, once a "regulated NSR pollutant" is emitted at levels at or above the major source applicability threshold other "regulated NSR pollutant[s]" that are emitted at levels above the significant emission rate thresholds are subject to review. Thus, and as shown in Table 4, PSD review is required for NOx (for NO_2 and as a precursor to ozone and $PM_{2.5}$) and $PM_{2.5}$. Total PM was not provided by the applicant. However, based on PM_{10} emissions being lower than the significance threshold of 25 tpy for Total PM, the EPA has determined the project is not significant for PM_{10} emissions. PSD requirements for greenhouse gases are only evaluated if emissions from another PSD pollutant triggers PSD permitting. In this case, another PSD pollutant triggers PSD permitting, but the significant emission rate for CO_2 equivalents does not exceed the threshold and therefore the pollutant will not be evaluated as part of the BACT analysis. The applicant included emissions from helicopters which are not required to be part of the PTE calculation for the project. Helicopter emissions are de minimis and whether their emissions are included or not will have no impact on determining PSD applicability.

Table 4. Worst Case Year Annual Emissions Estimates Compared with PSD Thresholds

Pollutant	Estimated Worst Case Annual Emissions (tpy)	Significant Emission Rate (tpy)	PSD Triggered?
NO_x [1]	320.2	40	Yes
CO	47.4	100	No
PM10	10.7	15	No
PM2.5	10.3	10	Yes
SO_2 [2]	2.4	40	No
VOC [3]	7.4	40	No
Lead	0.001	0.6	No
GHG as CO_{2e} [4]	20,775	75,000[a]	No

Notes:

[1] NO_2 is the compound regulated as a criteria pollutant; however, significant emissions are based on the sum of all oxides of nitrogen. NOx is a measured pollutant for the criteria pollutant NO_2 and a precursor for ozone and PM2.5.

[2] SO_2 is a criteria pollutant and a precursor for the criteria pollutant PM2.5.

[3] VOC is a measured pollutant and a precursor for the criteria pollutant ozone.

[4] CO_2 threshold only applies if PSD is triggered for another PSD pollutant.

B. Best Available Control Technology

Any facility that emits a regulated NSR pollutant at levels meeting or exceeding its PSD significant emission rate must perform a BACT analysis for that pollutant and comply with all subsequent regulatory obligations for that pollutant. A new major stationary source subject to PSD requirements is required to apply BACT for each pollutant subject to regulation under the CAA that it has the PTE in amounts equal to or greater than the pollutant's significant emission rate. *See* 40 CFR § 52.21(j). Therefore, BACT must be determined for each emission unit that emits these pollutants while operating as an OCS source.

The primary purpose of the BACT is to optimize prevention of significant deterioration of air quality and minimize the consumption of PSD air quality increments. The BACT determination accounts for energy, environmental, and economic impacts and other costs associated with application of alternative control systems. The case-by-case BACT approach provides a mechanism for determining and applying the best technology in each individual situation. In other words, the BACT requirement is the greatest degree of emissions control that can be achieved at a specific source and accounts for site-specific variables. BACT is defined, in

relevant part, as, *an emissions limitation ... based on the maximum degree of reduction for each pollutant subject to regulation under [the Clean Air] Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems and techniques ... for control of such pollutant. See* 40 C.F.R. § 52.21(b)(12); Clean Air Act (CAA) 169(3). SFW is required to apply BACT for NOx, NO_2 and $PM_{2.5}$ to all the emission units aggregated into the project's OCS source.

In making its BACT determinations, the EPA follows the following five step "top-down" methodology as outlined in the EPA policy memoranda and supported by the Environmental Appeals Board. [37, 38] For the purposes of fulfilling requirements for pollutants below PSD thresholds but above the state's minor source permitting or plan approval threshold, a BACT determination is made in Section VII. of this Fact Sheet for other criteria pollutants, namely sulfur dioxide (SO_2), carbon monoxide (CO), PM_{10}, and VOC as listed in MassDEP's BACT guidance document.[39]

> **1. Identify all control technologies.** Identify all possible control options, including inherently lower emitting processes and practices, add-on control equipment, or combination of inherently lower emitting processes and practices and add-on control equipment.
>
> **2. Eliminate technically infeasible options.** Eliminate technically infeasible options based on physical, chemical, and engineering principles.
>
> **3. Rank remaining control technologies.** Rank the remaining control options by control effectiveness, expected emission reduction, energy impacts, environmental impacts, and economic impacts.
>
> **4. Evaluate most effective controls and document results**. Determine the economic, energy, and environmental impacts of the control technology on a case-by-case basis.
>
> **5. Select the BACT**. Select the most effective option not rejected as the BACT.

Although BACT is usually determined for each regulated NSR pollutant at or above the significance level, the type of emission unit operating on an OCS source, i.e. engines, supports a different approach because engine design impacts several different regulated NSR pollutants. For example, minimizing NOx emissions from an engine by reducing high temperature combustion can result in increasing CO emissions (a pollutant under review for state-required BACT under Massachusetts' minor NSR program). For this reason, the following BACT analysis will group

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[37] *See* EPA's "Guidance for Determining BACT Under PSD" at https://www.epa.gov/sites/production/files/2015-07/documents/bactupsd.pdf and New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting (draft Oct. 1990) at https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf

[38] *See, e.g., In re: Prairie State Generating Company*, 13 E.A.D. 1, 12 (EAB 2006)

[39] *See* MassDEP's Best Available Control Technology (BACT) Guidance: Air Pollution Control Requirements for Construction, Substantial Reconstruction or Alteration of Facilities that Emit Air Contaminants, at https://www.mass.gov/doc/best-available-control-technology-bact-guidance/download, accessed January 13, 2021.

together several regulated NSR pollutants when determining BACT for diesel-fired engines and gasoline-fired engines.

1. Regulation of emission units on the OCS

Applicable emission limits for marine engines depend on the size, age and maximum power of the engine and whether the engine is considered an emergency or non-emergency engine. The emission limits for marine engines are divided into different Tier standards, ranging from Tier 1, which allows the highest emissions, to Tier 4, associated with the most stringent emissions limitations. The manufacturer of Tier 2 and higher internal combustion engines will build into the engines' design, air pollution control technologies such as turbocharger, aftercooler, and high injection pressure, with a Tier 4 engine having the most air pollution control technologies built into its design. Compliance with tiered standards set forth in the regulations is assured through a certification process. Recently, EPA harmonized EPA regulations with those of MARPOL (the International Convention for the Prevention of Pollution from Ships). Major differences between the EPA and MARPOL compliance requirements are: (1) EPA liability for in-use compliance rests with the engine manufacturer (it is the vessel operator in MARPOL), (2) EPA requires a durability demonstration (under MARPOL, compliance must be demonstrated only when the engine is installed in the vessel), and (3) certain test conditions and parameters.

Table 5. Summary of EPA Regulations for Marine Compression Ignition Engines

40 C.F.R. Part 1042	Emission standards and certification requirements for Tier 3 and Tier 4 marine diesel engines
40 C.F.R. Part 1043	Regulations implementing MARPOL Annex VI, including requirements for in-use fuels, marine diesel engines above 130 kW, and vessels with those engines
40 C.F.R. Part 1065	Exhaust emission test procedures for lab and in-field testing
40 C.F.R. Part 1068	General compliance provisions
40 C.F.R. Part 80	Sulfur limits for marine diesel fuel
40 C.F.R. Part 89	Emission standards and certification requirements for Tier 1 and Tier 2 marine diesel engines below 37 kW
40 C.F.R. Part 94	Emission standards and certification requirements for Tier 1 and Tier 2 marine diesel engines at or above 37 kW

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Table 6. Summary of EPA Regulations for Marine Spark Ignition Engines

40 C.F.R. Part 1045	Exhaust emission standards for 2010 and later model year engines
40 C.F.R. Part 1060	Evaporative emission standards
40 C.F.R. Part 1065	Exhaust emission test procedures for lab and in-field testing
40 C.F.R. Part 1068	General compliance provisions
40 C.F.R. Part 91	Original exhaust emission standards and compliance program; test procedures available through 2012 model year

EPA's newer regulations for marine compression ignition (CI) engines in 40 C.F.R. parts 1042 and 1043 reduce NOx and PM emissions and tighten emissions standards for large marine diesel engines when they are remanufactured. These regulations include the following elements:

- Near-term engine-out emissions standards, referred to as Tier 3 standards, for newly built marine diesel engines; and
- Longer-term standards, referred to as Tier 4 standards, for newly built marine diesel engines that reflect the application of high efficiency aftertreatment technology.

Older EPA regulations in 40 C.F.R. parts 92 and 94 include standards for emissions of PM, NOx, hydrocarbons (HC) and CO from marine compression-ignition engines (also called marine diesel engines). These standards rely on engine-based technologies rather than aftertreatment technology to reduce air emissions. For gasoline fired or spark ignition (SI) marine engines, the applicable emission standards require manufacturers to control exhaust emissions from the engines and evaporative emissions from fuel tanks and fuel lines.

Marine vessel regulations are structured so that the duty to comply rests primarily with the manufacturer. EPA relied on testing information from engines equipped with specific technologies to establish the tiered emission standards for a variety of types of engines, recognizing considerations for safety specifically in the marine environment. The regulations were designed in such a way that manufacturers may use these anticipated technologies, or they may find better ways to meet emission standards over time. Manufacturers of diesel engines have typically met the standards with more careful control of intake air and fuel injection, with some exhaust gas recirculation, and under the regulations, owners are not required to retire their old engines, vehicles, or equipment. Long-term standards for many of these engines generally involve additional use of aftertreatment devices such as diesel particulate filters and selective catalytic reduction (SCR). Additionally, the regulations contain a key tampering prohibition - an owner may not disable any emission controls installed on certified engines, vehicles, or equipment.

2. Stationary source aspects of the OCS source

Some vessels included in the windfarm's PTE and emissions modeling, as required by 40 C.F.R. part 55, are subject to operating limits, monitoring, recordkeeping and reporting requirements to ensure they will not exceed the potential emissions projected in the application and impact review. Vessels operating within 25 nautical miles of the OCS source are not subject to BACT requirements unless they meet the definition of an OCS source, and then only the stationary source aspects of the vessel are regulated. *See* 40 C.F.R. § 55.2.

Available control technologies and strategies for NOx and $PM_{2.5}$ identified as technically achievable for other OCS projects in the EPA's RACT/BACT/LAER Clearinghouse and California's South Coast Air Quality Management District databases and outlined in SFW's revised application include:

- Use of certified engine/compliance with NSPS or reciprocating internal combustion engine (RICE) maximum achievable control technology (MACT) standards
- Good combustion practices
- Proper engine design
- Limited hours of operation
- Use of low sulfur fuel
- SCR
- Installation of diesel particulate filter
- Diesel oxidation catalysts

Technologies used to reduce the regulated NSR pollutants (NOx, NO_2, and $PM_{2.5}$) can be separated into three categories: design and retrofits impacting the operational parameters, add-on controls and good engineering practices. The technologies falling into those three categories listed above are discussed in Section 6 of SFW's revised permit application. In the revised application, SFW proposes good engine design/good combustion practices, work practices such as preventive maintenance and using low-sulfur fuel to satisfy BACT. Potential add-on pollution control technologies are listed in the permit application and include but are not limited to SCR for lowering NOx emissions and diesel oxidation catalyst for lowering $PM_{2.5}$ emissions. As further outlined below, the EPA has reviewed that list and has not identified any additional technologies for Step 1 of the BACT analysis for engines on the WTGs, OSS, and OCS source vessels. Generally, for this project, add-on control technologies for engines are considered infeasible, with some exceptions.

3. Engines on WTGs and the OSS - NO_x, NO_2, and $PM_{2.5}$ BACT

Step 1 of BACT: Identify all control technologies

Control technologies included with SFW's application include design and retrofits impacting the operational parameters, add-on controls and good engineering practices. EPA did not identify any additional technologies.

Step 2 of BACT: Eliminate technically infeasible options

Internal combustion engines (i.e., generating sets) located on a WTG or OSS are required to meet 40 C.F.R. part 60, subpart IIII to the extent that the stationary source regulations are applicable. For the purposes of determining which emission limit is applicable to these internal combustion engines, the date that construction commences is the date the engine is ordered by the original owner or operator. For the internal combustion engines proposed for the OSS or WTGs, the EPA reviewed the difference between a Tier 3 and Tier 4 engine in 40 C.F.R. part 60, subpart IIII, 40 C.F.R. part 89, part 1039, and part 1042. The lowest emitting diesel-fired electric generators are generators certified to the highest Tier standard in 40 C.F.R. part 1039.

The NSPS rule allows non-emergency engines being installed on marine offshore installations to meet the emission standards in either: Section 60.4201(a), which requires Tier 4 standards for new non-emergency engines under part 1039, or in Section 60.4201(f), which requires applicable Tier standards from part 1042 depending on the engine size and model year.

The Tier 3 standards for domestic marine vessel engines were based on engine manufacturers' capabilities to reduce particulate matter (PM) and oxides of nitrogen (NOx) emissions with recalibration and other engine-based technologies. The Tier 4 standards were based on achieving emission reductions through the application of catalytic aftertreatment technology, including selective catalytic reduction (SCR). The Tier 4 engine standards require the use of exhaust aftertreatment technology, phased in from 2014 to 2017, depending on engine power. The 600 kW threshold for applying the Tier 4 standards was intended to avoid aftertreatment-based standards for small vessels used for certain applications that were most likely to be designed for high-speed operation with very compact engine installations.[40] Many of the technologies identified as part of the BACT analysis affect the actual design of the diesel-fired electric generator. The EPA recognized this fact in the NSPS for stationary compression ignition internal combustion engines (CI engine) by requiring standards for manufactures to meet. Therefore, a manufacturer of a Tier 3 or Tier 4 engine will incorporate technically feasible emission reduction technology into the engine's design. For example, a Tier 4 engine typically has an SCR system to reduce NOx emissions and a diesel particulate filter in combination with a diesel oxidation catalyst to reduce fine particulates. In other words, the pollution control equipment becomes an integral part of the overall engine, and accordingly, any additional pollution control equipment is considered infeasible.

Step 3: Rank remaining control technologies by control effectiveness

Engine manufacturers use different combinations of emission controls to meet EPA's NSPS standards, standards that include NOx and PM emission limits. For the types of engines that are expected to be used in the project, the combination of emission controls is irrelevant as long as the applicable standard is met.

[40] Prior to the 2008 rulemaking for marine vessel engine standards, EPA considered whether Tier 4 standards should apply to engines as small as 37 kW, because small land-based nonroad diesel engines were subject to similar aftertreatment-based standards.

Step 4: Evaluate the most effective controls and document results taking into account economic, energy and environmental impacts of the control technology

EPA developed the Tier standards for engines deployed in a marine environment and recognizes that the owner of a stationary source (an engine) can certify its engine based on applicable standards.

Step 5: Select BACT

In determining BACT for NO_x, NO_2 and $PM_{2.5}$ on engines installed on WTGs and at the OSS, Step 2 of the analysis involves eliminating technologies for pollution control that are technically infeasible. Step 3 and 4 involve ranking and evaluating the control technologies based on effectiveness. However, we find that control technologies beyond what is required for Tier 4 certified engines installed on the WTGs and OSS to be technically infeasible because EPA recognizes that emergency or non-emergency diesel CI engines beyond the highest tiered certification will not be available for use, bringing only those technologies not eliminated in Step 2 to Step 5.

For the project, engines installed on WTGs and at the OSS will be new and SFW proposes to purchase the highest tier available for their engine type in the revised application. A WTG or the OSS may be equipped with a single 200 kW diesel-fired engine at a time.

EPA has determined BACT for NOx, NO_2 and $PM_{2.5}$ to be a combination of good combustion practices, reducing idling where possible, and the Tier 4 engine required in 40 C.F.R. part 1039 for the new diesel-powered electric generators on the WTGs and the OSS. For engines defined as emergency engines, the operation limitations shall be restricted as outlined in the NSPS and further limited to 200 hours per year. New emergency engines are to be certified to the emission standards in 40 C.F.R. part 89. Additionally, smoke and opacity limits from 310 CMR 7.06 apply to satisfy BACT for PM.

Additionally, emergency engines subject to 40 CFR Part 60 Subpart IIII must meet the operational limitations in Section 60.4211(f) which allows emergency engines to operate for up to 100 hours per calendar year for maintenance checks and readiness testing. Fifty of the 100 hours per calendar year may be used for non-emergency use. So, if the engine will be operated for more than 50 hours a year for non-emergency purposes during commissioning and construction, the engine would need to meet the non-emergency standards found in Section 60.4201.

4. Engines on Vessels Operating as OCS Sources - NO_x, NO_2, and $PM_{2.5}$ BACT

At the time of this document, the vessel needs for installation of WTGs and the OSS change on short notice and require contracts within short timeframes. All internal combustion engines operated on OCS vessels will be operated by third parties, i.e., not by SFW. Therefore, the size and installation date of the engines are unknown. The EPA is considering these facts in determining BACT for the project.

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Step 1 of BACT: Identify all control technologies

In addition to add-on controls, the EPA can consider inherently lower-emitting processes/practices/designs within a BACT analysis.[41] Given the unique nature of constructing the project, the use of the highest tiered engine (this results in the lowest overall emissions of regulated NSR pollutants NO_x, NO_2 and $PM_{2.5}$) available at the "time of deployment" is identified as the option for BACT for vessels operating as OCS sources, as a work practice standard. Time of deployment is impacted by several factors, including but not limited to, construction timetable and contractual obligations. Until the offshore wind industry matures, it will be challenging to secure experienced installation contractors and offshore components, and finding the vessels needed for a windfarm of this size and complexity at the time they are needed to meet established construction schedules is difficult. SFW and other offshore wind developers have indicated that they must rely heavily upon European vessels and installation equipment, which often have limited availability. Developers may even have to compete for vessels used to construct other nearby windfarms within the same timeframe. Additionally, the construction occurs from spring through the late fall so that hazardous winter conditions can be avoided, limiting the opportunities to deviate from the overall construction schedule for the project. Therefore, in Step 1 of BACT for vessels operating as OCS sources, EPA recognizes that engines must be available to SFW for construction to proceed.

Step 2 of BACT: Eliminate technically infeasible options

As part of Step 2 of the BACT analysis, the EPA has reviewed the technical feasibility of different add-on control technologies and has determined that add-on controls are technically infeasible due to the unique considerations related to contracting vessels for this type of project as well as due to space constraints on the vessels. The feasible alternative is to allow construction to proceed while ensuring use of the cleanest engines available at the "time of deployment".

Step 3: Rank remaining control technologies by control effectiveness

There is only a single feasible technology for construction of the windfarm: for SFW to use the cleanest engines available at the "time of deployment".

Step 4: Evaluate the most effective controls and document results taking into account economic, energy and environmental impacts of the control technology

Again, there is only a single feasible technology for construction of the windfarm: for SFW to use the cleanest engines available at the "time of deployment".

Step 5: Select BACT

The single remaining technology of requiring the cleanest engines available at the "time of deployment" is carried through to Step 5 of the BACT analysis. Thus, for the overall construction of the windfarm to be feasible, the EPA's draft permit provides that SFW must use the cleanest vessels available from the contractors at the "time of deployment" based on the

[41] *See* EPA Guidance "PSD and Title V Permitting Guidance for Greenhouse Gases," dated March 2011, p. 25.

availability of those vessels from the contractors SFW retains. If the cleanest engines are unavailable at the "time of deployment," and SFW must select higher-emitting vessels during the contracting and deployment process, SFW will need to obtain a greater amount of emission offsets.

A requirement in the California State Implementation Plan (CA SIP)[42] that requires certain defined vessels to have engines certified to at least Tier 2 standards. The EPA has identified within the draft permit that these certain defined vessels, a feeder jack-up vessel and certain crew and supply vessels, even if these vessels were foreign flagged, would be regulated by the CA SIP and would need all engines to meet at least the emission standards for Tier 2 engines in 40 C.F.R. part 94. For crew transfer vessels, requiring the use of marine engines certified to either Tier 4 or 3 standards cannot be eliminated in Step 2 because it is not technologically infeasible for the primary crew transport vessel to have engines meeting these higher Tier standards. Nor can the use of marine engines certified to these higher Tier standards be eliminated in step 4 due to adverse economic, energy, and environmental impacts. Therefore, EPA has determined under BACT that for the engines installed on the primary crew transport, the engines must meet, depending on the engine(s)' design, the Tier 3 or Tier 4 certification for marine engines in 40 C.F.R. § 1042.101.

Additionally, smoke and opacity limits from 310 CMR 7.06 apply to satisfy BACT for PM.

C. Ambient Air Impact Analysis

The regulations at 40 C.F.R. part 51, Appendix W (*Guideline on Air Quality Models*; "the *Guideline*") provide the requirements for analyses of ambient air quality impacts. The *Guideline* specifies EPA's preferred models and other techniques, as well as guidance for their use in regulatory application in estimating ambient concentrations of air pollutants. The analyses of ambient air impacts described in this section were conducted in accordance with the *Guideline*.

The ambient air impact analysis for the project was conducted to account for two periods: the construction phase and the operational phase. The construction phase emissions account for the highest annual emissions from the source, and the analysis of ambient air impacts due to construction are described in the first section below. Operational phase emissions for the source are considerably lower than construction period emissions for the source on an annual basis, and the analysis of ambient air impacts for the source during the operational phase are described in the second section below. The modeled emissions rely on a conservative estimate of emissions associated with the source. Furthermore, modeling included three different scenarios in which all vessels transit to and from the WA from either New Bedford, Massachusetts; New London, Connecticut; or ProvPort in Providence, Rhode Island; and the maximum impacts from any modeled scenario were used for comparison against the relevant air quality metric (e.g,, NAAQS, PSD increment). Therefore, ambient air impacts from the source will be no worse than those shown in this ambient air impact analysis.

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[42] California's "Airborne Toxic Control Measure for Commercial Harbor Craft" Title 17, California Code of Regulations, Section 93118.5 was identified as the most stringent SIP limit for vessels. *See* 81 FR 39424 (6/16/2016).

Table 7 provides the applicable NAAQS, PSD Increment, and significant impact levels (SILs), which were used in determining air quality impacts from the project. The original modeling supplied by the applicant was for a lower level of annual emissions than required. Memoranda supplied in November and December 2020 and included in the administrative record for this proposed permit, indicate that impacts resulting from the higher level of emissions do not violate the NAAQS or PSD Increment.

Table 7. NAAQS, PSD Increment, and SILs, in μg/m³

Pollutant/ Averaging time	NAAQS[a]		PSD Class II Increment[b]	Class I SIL	Class II SIL
	Primary	Secondary			
$PM_{2.5}$					
Annual	12	15	4	0.05[c]	0.2[c]
24-hour	35	35	9	0.27[c]	1.2[c]
NO_2					
Annual	100	100	25	0.1[d]	1[d]
1-hour	188	NA	NA	NA	7.5[e]

Note: NA = Not applicable. Concentrations are presented in μg/m³, though for NO_2 concentrations are typically reported for non-modeling applications in parts per billion (ppb).

a. *See* 40 C.F.R. Part 50. These values are equivalent to the Ambient Air Quality Standards for the Commonwealth of Massachusetts at 310 CMR 6.00.

b. *See* 40 C.F.R. § 52.21(c).

c. EPA's April 17, 2018 Guidance and associated legal memorandum and technical support documents, included as part of the permit record.

d. Values proposed by the applicant. These values are consistent with values proposed by EPA. *See* 61 FR 38250, "Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR)."

e. EPA, June 29, 2010, "Guidance Concerning the Implementation of the 1-hour NO_2 NAAQS for the Prevention of Significant Deterioration Program." The interim SIL value of 4 ppb (or 7.5 μg/m³) was used.

1. Construction Phase

The PSD permitting regulations for proposed major new sources generally require applicants to perform an air quality impact analysis for those pollutants emitted in significant quantities. For temporary emission sources subject to the PSD permitting requirements, the PSD regulations at 40 C.F.R. § 52.21(i)(3) require an assessment of the ambient air impact for Class I areas and areas where the applicable PSD increment is known to be violated. Assessment of the construction emissions was provided by the applicant in a September 2020 report "Outer Continental Shelf Permit – Air Quality Impact Modeling Report for Construction Emissions," provided as Appendix B of its September 30, 2020 application, as supplemented by memoranda supplied by the applicant entitled "OCS Area and Emission Estimates" on November 4, 2020 and January 4, 2021.

The following sections provide the information EPA considered in determining the appropriate ambient air impacts analysis requirements to which the source is subject for the construction period and whether those requirements have been satisfied. Specifically, the sections below describe, for the construction period, a) the qualification as temporary, b) the assessment of ambient air impacts at areas where PSD increment is known to be violated, c) the assessment of

ambient air impacts at Class I areas, d) results of the assessment for the source, and e) EPA's overall conclusion about the ambient air impacts during the construction phase for the source.

a. Qualification as a Temporary Source

The subject emissions associated with the construction of the source are anticipated to last no longer than a period of two years. The EPA considers construction sources operating for two years to be temporary sources for PSD permitting purposes. *See* Amended Regulations for Prevention of Significant Deterioration of Air Quality, 45 Fed. Reg. 52676, 52719, 52728 (August 7, 1980). Since the construction emissions for the source are anticipated to last no longer than two years, the construction emissions are considered temporary.

b. Assessment of Ambient Air Impacts at Areas Where PSD Increment Is Known to be Violated

The impact-related criteria that must be met for a temporary source under 40 C.F.R. § 52.21(i)(3) require that emissions must not impact any area where the applicable increment is known to be violated. EPA corresponded with MassDEP and the Rhode Island Department of Environmental Management (RIDEM) on March 2, 2021 and March 3, 2021, respectively, and confirmed there are no areas in Massachusetts or Rhode Island that are known to be violating the PSD increment for NO_2 or $PM_{2.5}$. Therefore, because of the absence of areas known to be in violation of PSD increment in the vicinity of the source, EPA concludes that construction emissions for the source will not impact any such area where applicable PSD increment is known to be violated.

c. Assessment of Ambient Air Impacts at Class I Areas

The impact-related criteria that must be met for a temporary source under 40 C.F.R. § 52.21(i)(3) require that the emissions must not impact any Class I area. Class I areas are defined in 40 C.F.R. § 52.21(e). The Class I areas closest to the construction area are the Lye Brook Wilderness area, located in southwestern Vermont (within the Green Mountain National Forest), 264 km from the WA; Presidential Range-Dry River Wilderness area, located in Northern New Hampshire, 330 km from the WA; and Brigantine Wilderness area, located in Southeastern New Jersey (within the Edwin B. Forsythe National Wildlife Refuge), 312 km from the WA. EPA measured these distances to each Class I area from the edge of the lease area, as opposed to distances provided by the applicant from the center of the WA. A map of the location of these Class I areas with respect to the windfarm is presented in Figure 2.

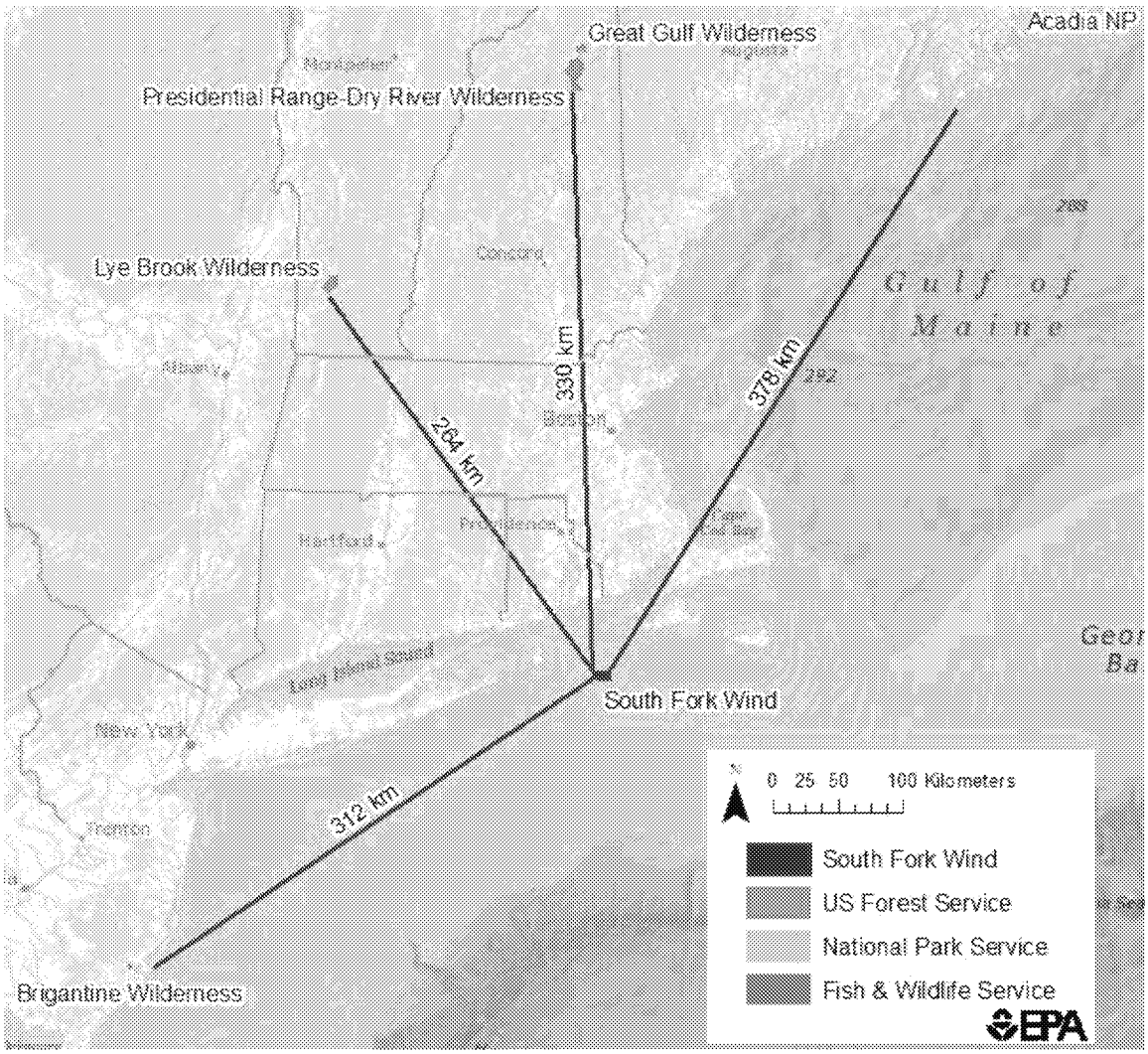

Figure 2. Distances Between the SFW Area and the Closest Class I Areas

SFW compared the modeled impacts at Class I areas with Class I PSD SILs, for those pollutants for which Class I PSD SILs have been established, to assess whether ambient air quality will be significantly affected. The *Guideline* specifies a two-tier screening approach for long-range transport assessments. The first-tier approach, described in section 4.2.c.i of the *Guideline*, is assessment of near-field impacts at or within 50 km of the source. The second-tier approach, described in section 4.2.c.ii of the *Guideline*, sets forth a case-specific assessment in consultation with the EPA Regional Office.

<u>Assessment of NO_2 Impacts at Class I Areas</u>

SFW evaluated the air quality impacts related to construction emissions for the source at Class I areas using air quality modeling information. Consistent with section 4.2.c.i of the *Guideline*, SFW assessed the significance of ambient impacts for NO_2 at 50 km from the source as a first-tier analysis. The analysis of NO_2 impacts included both emissions occuring within the WA area

and on the export cable corridor that are closer to the Lye Brook Wilderness area.[43] Assessment for NO_2 at the 50 km distance was sufficient to demonstrate impacts below the significance level. SFW applied EPA's ambient ratio method 2 (ARM2) screening method. Initial modeling identified the scenarios including transits from New Bedford and New London ports as having higher impact levels at the 50-km screening distance, so only those two scenarios were carried forward for comparison against the SIL. EPA has evaluated SFW's approach in assessing NO_2 impacts and believes it is suitable to identify those impacts resulting from the source in the Class I area.

Assessment of $PM_{2.5}$ Impacts at Class I Areas

For $PM_{2.5}$, SFW conducted a second-tier assessment for the representative distance to the nearest Class I area (i.e., 268 km) without first conducting a first-tier assessment of the significance at the 50-km distance. This approach was developed in consultation with EPA Region 1, consistent with the second-tier screening requirements described in section 4.2.c.ii of the *Guideline*. Project emissions within 25 nm from the WA and the export cable corridor were included in the analysis. Comparisons of construction period impacts for the source to significance levels are presented in Table at the end of this section.

As explained in its April 17, 2018 memorandum, "Guidance on Significant Impact Levels (SIL) for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program" (EPA's April 17, 2018 Guidance), the EPA has recognized that permitting authorities have the discretion to apply SILs on a case-by-case basis in the review of individual permit applications. In 2010, the EPA finalized a rule to codify, among other things, particular $PM_{2.5}$ SIL values and specific applications of those values. In litigation over that rule, the EPA conceded the regulation was flawed because it did not preserve the discretion of permitting authorities to require additional analysis in certain circumstances. The court granted the EPA's request to vacate and remand the rule so that the EPA could address the flaw. *See Sierra Club v. EPA*, 705 F.3d 458 (D.C. Cir. 2013). The EPA subsequently addressed the use of SILs in the EPA's April 17, 2018 Guidance. For the purposes of this permitting action, the EPA is using $PM_{2.5}$ SILs as a compliance demonstration tool based on the technical and legal bases accompanying its April 17, 2018 Guidance. These documents (i.e., the SILs memorandum, technical analysis, and legal memorandum) are provided in the administrative record associated with the draft permit. The use of the $PM_{2.5}$ SIL as an indication of a significant impact on a Class I area was not the basis for the court's $PM_{2.5}$ SIL vacatur. Given this fact, the previous use of the $PM_{2.5}$ SILs as a significant impact indicator, and the lack of any other objective concentration metric, its use as a concentration considered small enough to qualify for the temporary source exemption (i.e., no impact to Class I areas) appears appropriate.

To assess direct impacts at the 50-km distance, SFW selected the Offshore and Coastal Dispersion (OCD) model (version 5) consistent with the *Guideline*. SFW prepared hourly

[43] As described earlier in Section IV.C.2, EPA is no longer considering anchored cable laying vessels as meeting the definition of an OCS source. Emissions from anchored cable laying vessels will count toward the PTE of the project within 25 nautical miles of the centroid of the WA. However, these vessels are not regulated by this permit and will not be subject to permit requirements. Therefore, SFW's modeling analysis will result in overestimates of the project impact and is therefore conservative in nature.

representative onshore and offshore meteorological data for use with OCD based on prognostic meteorological modeling data provided by EPA.[44] Prior to using the meteorological data with OCD, SFW submitted an evaluation to demonstrate the suitability of the prognostic meteorological data for such a purpose.

For secondary impacts of $PM_{2.5}$, SFW used a Tier 1 demonstration tool based on existing technically credible and appropriate relationships between emissions and impacts developed from previous modeling, as described in section 5.2(e) of the *Guideline*. SFW's approach for assessing secondary $PM_{2.5}$ impacts is consistent with EPA's April 30, 2019 "Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program" (EPA's April 30, 2019 Guidance). In assessing secondary impacts for $PM_{2.5}$, SFW relied on information provided by the EPA related to the EPA modeling of secondary formation of $PM_{2.5}$ constituents due to precursor emissions for hypothetical low-level (i.e., short stack) sources. Information about the EPA hypothetical source modeling is provided in the EPA's April 30, 2019 Guidance. The two hypothetical sources for which SFW evaluated secondary formation provide atmospheric chemistry that is suitably representative of the area around the WA. These sources were the Norfolk Co. and Franklin Co., Massachusetts hypothetical sources. SFW identified the highest annual and 24-hour nitrate and sulfate impact levels in any direction at or beyond 200 km from either of the hypothetical sources and selected the maximum of impacts at or beyond that distance. By selecting the highest impacts at any direction for either of these sources for the appropriate distance, the derived value is suitably conservative (i.e., likely to overestimate impacts) for use in this screening assessment. Furthermore, the 200-km distance is considerably less than the distance between the WA and the nearest Class I area. Then, SFW scaled the hypothetical impacts based on the ratio of the emissions to the EPA's hypothetical source modeling emissions (i.e., 500 tpy) to derive an expected secondary impact for nitrate and sulfate constituents for 24-hour and annual averaging periods. The sum of these nitrate and sulfate impacts is the total secondary $PM_{2.5}$ impact using this approach at 200 km. Similarly, EPA provided to the applicant primary impacts levels for scaling direct impacts at the 200-km distance based on hypothetical source impacts for $PM_{2.5}$. For $PM_{2.5}$, the combined primary and secondary impacts were compared to the Class I PSD SIL.

d. Ambient Air Impacts for the Construction Period

Annual construction period impacts for NO_2 and $PM_{2.5}$ were shown to be below significance levels at distances less than or equal to the distance of the nearest Class I area using the two-tier approach described above. As stated in the previous section, SFW performed a first-tier assessment for annual NO_2, and a second-tier assessment for annual and 24-hour $PM_{2.5}$.

The total ambient air impacts for pollutants emitted from construction of the source discussed in this section are presented in Table 8 below. Concentrations in air are given in micrograms per cubic meter ($\mu g/m^3$). Impacts for each pollutant and associated averaging time for which Class I

[44] The meteorological data were extracted from the Weather Research and Forecasting (WRF) prognostic model for the three-year period of 2013-2015 using the Mesoscale Model Interface Program (MMIF, version 3.4). The demonstration is provided as Appendix B to the July 2020 Draft South Fork Wind Farm Air Quality Impact Modeling Protocol for Construction Emissions, available as part of the administrative record for the draft permit.

area SILs have been established are shown to be below significance levels at distances relevant to the Class I area.

Table 8. Assessment of Construction Period Ambient Air Impact for the Source

Pollutant/ Averaging time	Class I PSD SIL ($\mu g/m^3$)	Highest Total Impacts ($\mu g/m^3$)	Assessment Distance (km)	Impact Below SIL?
$PM_{2.5}$				
Annual	0.05	0.0037[a,b]	200	Yes
24-hr	0.27	0.0310[a]	200	Yes
NO_2				
Annual	0.1	0.0996	50	Yes

Note: Concentrations are presented in $\mu g/m^3$, though NO_2 concentrations are typically reported for non-modeling applications in parts per billion (ppb).
a. $PM_{2.5}$ reported as the sum of primary and secondary impacts from the maximum emissions scenario.
b. EPA relied on the emissions values supplied in SFW's January 4, 2021 supplement in calculating this value.

Though the NO_2 impact level used for comparison is only slightly below the level of the SIL, the predicted impact is a conservative, first-tier screening at a much closer distance than the representative distance to the Class I area. In other words, the model predicted impacts at Class I areas are expected to be higher than would actually result from the construction emissions.

e. EPA Conclusion About Ambient Air Impacts During Construction Period

The EPA has assessed the ambient air quality demonstration submitted by SFW and concludes that it is appropriate for its intended purpose of estimating construction period impacts from the source. Therefore, the EPA concludes that there will be no significant impacts at Class I areas resulting from construction of the source. Details of SFW's modeling are provided in the applicant's modeling reports included in the administrative record.

2. Operational Phase

The PSD permitting regulations for proposed major new sources generally require applicants to perform an air quality impact analysis for those pollutants with significant emissions. Though most emissions for the operational phase are below these thresholds, all emissions during both the construction and operational phases must be appropriately assessed to ensure that emissions from the source do not cause or contribute to a violation of the NAAQS or PSD Increment. Assessment of the construction emissions was provided by the applicant in a September 2020 report "Outer Continental Shelf Permit – Air Quality Impact Modeling Report for Operations and Maintenance Emissions," provided as Appendix C of its September 30, 2020 application, as supplemented by memoranda supplied by the applicant entitled "OCS Area and Emission Estimates" on November 4, 2020 and January 4, 2021.

The following sections provide the EPA's assessment of information provided by SFW in determining whether ambient air impacts from the source are protective of air quality standards.

Specifically, the sections below describe a) an overview of the air modeling conducted by SFW, b) comparison of operational phase impacts against the SILs, c) comparison of operational phase impacts against the NAAQS, d) comparison of operational phase impacts against the PSD Increments for Class I and Class II areas, e) assessment of operational phase impairment to visibility, soils, and vegetation, and f) EPA's conclusion about the ambient air impacts during the operational phase of the source.

a. Overview of the Air Modeling Conducted by SFW

To assess direct impacts within a 50-km distance, SFW selected the OCD model, consistent with the *Guideline*. SFW relied on the same meteorological dataset as used with the OCD modeling analysis for construction period impacts, described in Section V.C.1 above. Emissions included in the analysis represent the highest emitting activities anticipated for the operational period of the source. Impacts from multiple emission scenarios (representing different activities) are assessed separately or combined as appropriate depending on the averaging time period for the relevant air quality standard. SFW assessed impacts at an array of receptors centered around the northern-most location in the work area for the project. This northern-most location is at the north-western corner of the work area.

The source must also account for secondary formation of $PM_{2.5}$ resulting from precursor emissions of SO_2 and NO_X. To do so, SFW employed the MERPs approach, which is an appropriate Tier 1 demonstration tool consistent with requirements in section 5.4.2.b of the *Guideline*, as described in the EPA's April 30, 2019 Guidance. SFW applied the same approach described in Section V.C.1 above in estimating secondary $PM_{2.5}$ formation resulting from emissions of NO_X and SO_X. Specifically, SFW relied on the more conservative MERPs value for between two appropriately representative hypothetical sources in Massachusetts. SFW combined the maximum predicted secondary $PM_{2.5}$ impacts with the modeled primary (i.e., resulting from direct emissions) $PM_{2.5}$ impacts to calculate total $PM_{2.5}$ impacts for comparison with the SIL, NAAQS, and Class II PSD Increment.

Modeling methodologies, inputs, and techniques were consistent with the *Guideline* and the EPA guidance. Receptors were included in a dense grid nearer to the WA and more sparsely farther from the WA area out to 50 km. No receptors were excluded from analysis. SFW justified treatment of certain emissions as intermittent with regard to the 1-hour NO_2 NAAQS as addressed in the EPA's March 1, 2011 memorandum, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard" (EPA's March 1, 2011 Guidance). As such, SFW applied a ratio of the number of operating hours per year by 8,760 hours to the 1-hour NO_2 emissions because anticipated emissions. The EPA agrees that SFW has appropriately represented the intermittent sources and accounted for their expected operation with respect to the 1-hour NO_2 standard. The EPA has evaluated the methods and techniques included in the air quality impact analyses for the operational period provided by SFW and determined that they are appropriate for assessing compliance with the NAAQS, SILs, and PSD Increment.

b. Assessment of Significant Impacts

The $PM_{2.5}$ SILs used in this portion of the assessment were established in the EPA's April 17, 2018 Guidance, as described earlier, with associated legal memorandum and technical support documents. The EPA is relying on the SIL recommended in the April 17, 2018 Guidance as appropriate for the WA facility.

SFW's screening model results for NO_2 and $PM_{2.5}$ are presented in Table 9. This screening modeling indicates that impacts for annual NO_2 and annual $PM_{2.5}$ were below the significance threshold and no further analysis is warranted. Further analysis was required for 1-hour NO_2 and 24-hour $PM_{2.5}$. The sections below provide summaries of these analyses. Because the modeling scenarios were representative of maximum emissions around each foundation that will be operated as part of the windfarm, the EPA considers the significant impact area radius to extend from each foundation rather than at the individual receptors used in this modeling assessment.

Table 9. Comparison of WA Facility Operational Period Impacts Against SILs

Pollutant	Averaging Time	Class II SIL ($\mu g/m^3$)	Impact ($\mu g/m^3$)	Significant Impacts?	Significant Impact Area Radius (km)
NO_2	1-hour	7.5	44.9	**Yes**	4.5
	Annual	1	0.85[a]	No	NA
$PM_{2.5}$	24-hour	1.2	8.35	**Yes**	2.5
	Annual	0.2	0.02[a]	No	NA

Note: NA = Not applicable. Concentrations are presented in $\mu g/m^3$, though for NO_2 concentrations are typically reported for non-modeling applications in parts per billion (ppb).

a. Modeling for the annual NO_2 and $PM_{2.5}$ significant impact level assessment were based on emissions within 25 statute miles from the WA centroid. The January 4, 2021 supplement indicated that including project emissions within 25 nautical miles (i.e., additional emissions from transiting vessels) would not change the modeling results substantially. Based on this information and EPA's evaluation of the modeling information which shows that annual impacts are mainly located near the project area, EPA concludes the submitted information is an appropriate assessment of impacts for the annual NAAQS for these pollutants.

c. Compliance with the NAAQS

SFW completed a refined modeling analysis for 1-hour NO_2 and 24-hour $PM_{2.5}$.

When using results from refined modeling for NAAQS compliance, background concentrations including impacts from nearby sources must be combined with impacts to identify total ambient concentrations for comparison with the NAAQS. SFW selected onshore monitoring data as appropriately representative of air quality in the area. The EPA finds that this assumption is protective of air quality because it likely overestimates concentrations near the windfarm. The windfarm area is at least 30 km from any major source of emissions, so the EPA concludes that monitored background values account for all nearby sources.

All refined modeling was performed in accordance with the *Guideline* and in consultation with the EPA. Total impacts of $PM_{2.5}$ included both primary and secondary impacts. Assessment of impacts for NO_2 impacts predicted by OCD were post-processed with the ARM2 equation tier 2 screening method in a manner consistent with the *Guideline*. SFW applied this as a post-processing step because OCD does not have capabilities to implement this approach directly or include more refined techniques for NO_2 impact screening. The EPA concludes that SFW's modeling was appropriate to assess impacts for these pollutants. A summary of the refined modeling, which demonstrates compliance with the NAAQS for all pollutants, is presented in Table 10 below.

Table 10. NAAQS Assessment Results

Pollutant/ Averaging Time	Impact ($\mu g/m^3$)	Background Level ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Exceeds NAAQS?
1-hour NO_2	42.8	74.0	116.8	188	No
24-hour $PM_{2.5}$	4.4	14.2	18.6	35	No

Note: NA = Not applicable. Concentrations are presented in $\mu g/m^3$, though NO_2 concentrations are typically reported for non-modeling applications in parts per billion (ppb).

The EPA concludes that the assessment provided by SFW sufficiently demonstrates that air quality impacts will not violate the NAAQS for any pollutant.

d. Compliance with Class II PSD Increment

SFW is required to demonstrate compliance with the PSD Increment for $PM_{2.5}$ and NO_2 because the project is a major source for both pollutants. The significance analysis presented above demonstrates compliance with the PSD Increment for the annual NO_2 and annual $PM_{2.5}$. SFW supplied a PSD Increment analysis for the 24-hour $PM_{2.5}$ NAAQS, for which the project was shown to have significant impacts (*See* Table). There is no PSD Increment for 1-hour NO_2, so no PSD Increment analysis is required. Table presents the maximum PSD Increment consumed for 24-hour $PM_{2.5}$ within the significant impact area, as described in Section V.C.2.b and presented in Table . The maximum PSD Increment consumption occurs within 125 meters of each WTG, and no more than half is consumed beyond 475 meters from each WTG. The PSD Increment consumption for 24-hour $PM_{2.5}$ around a single WTG foundation is shown in Figure 3.

Nomans Land island in the Town of Chilmark in Dukes County, Massachusetts is the closest land area to the OCS area where the windfarm project is located, and this onshore area is the COA for the project. In Massachusetts, the PSD Increment, the maximum amount of pollution an area is allowed to increase, is tracked by county for $PM_{2.5}$ and by municipality for NO_2. No previous major source project has triggered the minor source baseline date, the date used to determine the baseline concentration in the area, in Dukes County, or any portion thereof. Because the windfarm is not located within the jurisdiction of the Town of Chilmark or Dukes County, the project does not establish a minor source baseline date for the onshore areas

corresponding to the project. Instead, the EPA considers the OCS lease area as the baseline area for which the minor source baseline date is set for this OCS project. That is, the minor source baseline date for BOEM Lease OCS-A 0517 is January 13, 2021 (set by SFW) for NO_2 and $PM_{2.5}$.[45] No other sources have consumed PSD Increment in or around the area. Therefore, no additional sources are included in the modeling analysis for PSD Increment. The EPA has reviewed the modeling assessment for PSD Increment performed by SFW and concludes that the analysis was performed appropriately.

Table 11. Class II PSD Increment Assessment Results

Pollutant/ Averaging Time	Impact ($\mu g/m^3$)	Class II PSD Increment ($\mu g/m^3$)	Percent of Increment Consumed
24-hour $PM_{2.5}$	8.71[a]	9	96.8%

a. This value includes both primary and secondary $PM_{2.5}$ impacts.

[45] The PSD regulations at 40 C.F.R. § 52.21(b)(14)(ii) define the minor source baseline date as the earliest date after the trigger date on which a major stationary source or a major modification subject to 40 C.F.R. § 52.21 or to regulations approved pursuant to 40 C.F.R. § 51.166 submits a complete application under the relevant regulations. The trigger date for $PM_{2.5}$ is October 20, 2011.

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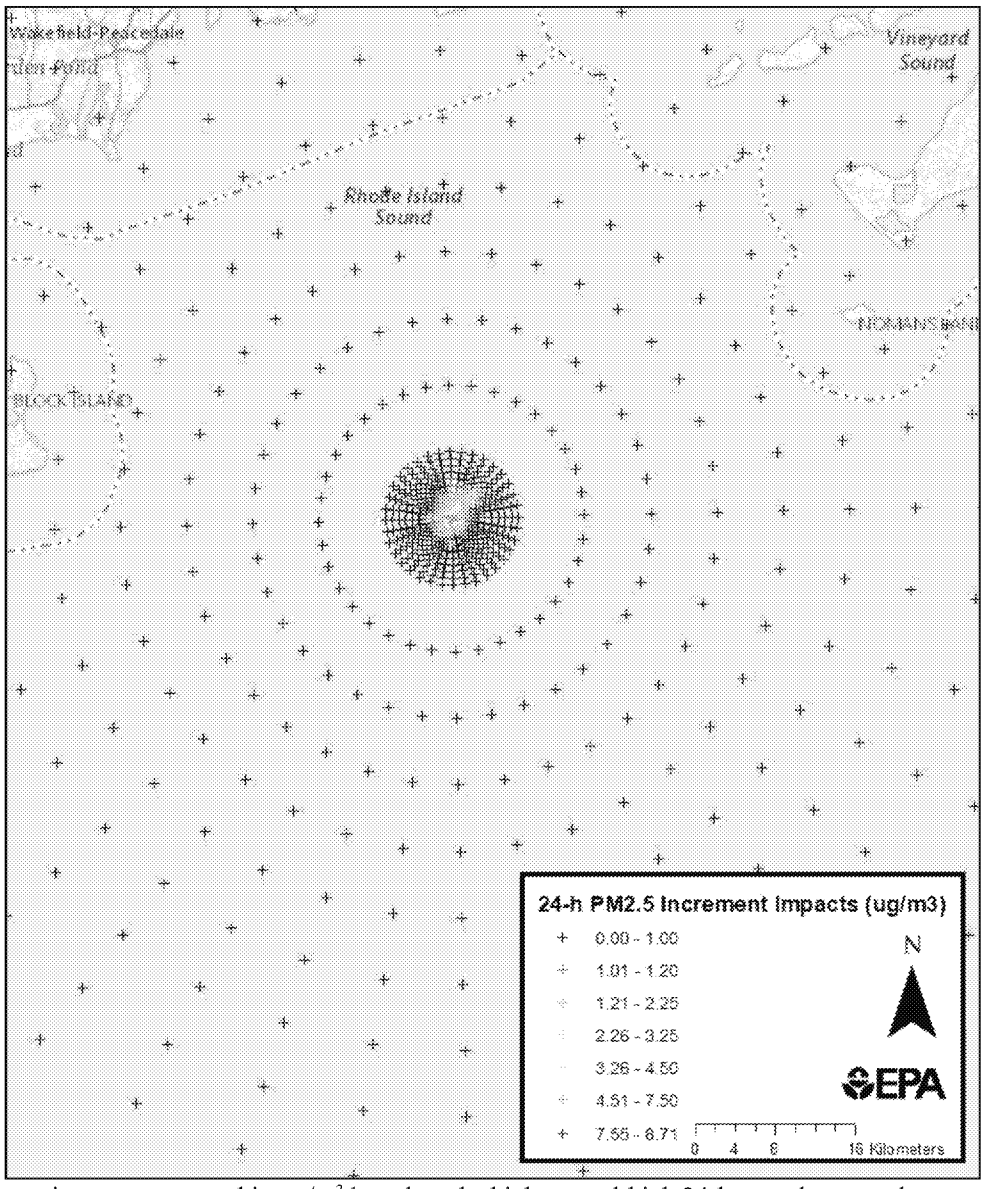

Note: Concentrations are presented in μg/m^3 based on the high second-high 24-hour value at each receptor. SFW assessed impacts at an array of receptors centered around the northern-most location in the work area for the project. This northern-most location is at the north-western corner of the work area.

Figure 3. Modeled Impacts for the 24-hour $PM_{2.5}$ PSD Class II Increment

e. Significance at Class I areas

SFW assessed the significance levels at Class I areas by assessing the maximum impacts at 50 km from the source. Table 12 presents these values. The EPA has reviewed the modeling assessment for Class I area significance and concludes that the analysis was performed appropriately.

Table 12. Class I PSD Significance Assessment

Pollutant/ Averaging Time	Impact ($\mu g/m^3$)	Class I PSD SIL ($\mu g/m^3$)	Significant Impacts?
Annual NO_2	0.01	0.1	No
Annual $PM_{2.5}$	<0.01[a,b]	0.05	No
24-hour $PM_{2.5}$	0.08[a]	0.27	No

a. This value includes both primary and secondary $PM_{2.5}$ impacts.
b. OCD reports all results below 0.005 $\mu g/m^3$ as zero. All primary impact results of zero from OCD are reported here as <0.01 $\mu g/m^3$.

f. Impairment to Visibility, Soils, Vegetation, and Growth

SFW provided an analysis consistent with the requirements of 40 C.F.R. § 52.21(o) to assess air quality impacts and impairment to visibility, soils, and vegetation due to operational period emissions of the WA facility and general commercial, residential, industrial and other growth associated with the operational period of the windfarm. The EPA has evaluated the analyses provided by SFW to address these requirements.

Regarding visibility, SFW submitted an analysis of impacts on Class I areas based on the "emissions divided by distance" approach which showed impacts below the screening level. In addition, SFW applied the EPA VISCREEN model to assess visibility impacts at nearby Class II area vistas and found that visibility impacts were below significance criteria. The EPA finds that the SFW analysis is appropriate to identify impacts to visibility and that impacts are below the screening thresholds. Therefore, the EPA concludes that operational emissions from the windfarm will not impair visibility.

SFW assessed impacts on soil and vegetation by comparing the maximum concentrations predicted by OCD against screening values derived from EPA's December 12, 1980 "Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals: Final Report." The EPA finds that the SFW analysis is appropriate to identify impacts to vegetation and that impacts are well below the screening thresholds. EPA expects that impacts to soil will be similarly low based on the presented emissions levels and distance to land areas from the source. Therefore, EPA concludes that operational emissions from the windfarm will not impair soil or vegetation.

SFW described projected growth resulting from the operation of the windfarm and stated that no new significant emissions would be associated with population, economic, and employment growth due to the source.

Based on the results of the analyses and the EPA's evaluation, the EPA finds that the operational period emissions and associated impacts from commercial, residential, industrial, and other growth will not result in an impairment to visibility, soils, or vegetation.

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g. EPA Conclusion About Ambient Air Impacts During Operational Period

The EPA has assessed the analyses submitted by SFW related to ambient air impacts during the operational period. Based on this information and the EPA's assessment, as described above, the EPA concludes that the operational period emissions will not cause or contribute to violations of the NAAQS or PSD Increment. Therefore, the ambient air impact requirements of the PSD regulations for the operational period of the source have been satisfied. Under the applicable Massachusetts regulations at 310 CMR 7.00 incorporated into 40 C.F.R. part 55, EPA has authority to require additional modeling for pollutants that are non-major for this project. Based on the location of the project in an area that is remote from residences, the generally diffuse nature of the emissions sources, and the anticipated environmental benefits of the project, EPA is choosing not to exercise its authority to require additional modeling for the operational phase of this project.

D. Consultation with Federal Land Managers

For sources impacting Federal Class I areas, 40 C.F.R. § 52.21(p) requires the EPA to consider any demonstration by the Federal Land Manager that emissions from the proposed source would have an adverse impact on air quality related values, including visibility impairment. If EPA concurs with the demonstration, the rules require that the EPA shall not issue the PSD permit.

On September 18, 2020, the applicant submitted a Request for Determination to the Forest Service, which manages the Lye Brook Wilderness area, and also notified the Fish & Wildlife Service (FWS), which manages the Brigantine Wilderness area, about the source. On September 25, 2020, the Forest Service determined that it would not request Air Quality Related Values (AQRV) analyses for the source. On June 1, 2021, EPA held a call with the FWS to discuss whether an AQRV would be required for the source, and subsequently EPA provided additional information to FWS to inform the determination.

VI. Nonattainment New Source Review Requirements

The NNSR regulations in Massachusetts specify that new major stationary sources or major modifications to an existing major source within an air quality non-attainment area must undergo a NNSR review and obtain all applicable federal and state preconstruction permits prior to commencement of construction. The intent of the NNSR review and conditions are to ensure that the increased emissions from a new or modified source are controlled to the greatest degree possible; that more than equivalent offsetting emissions reductions (emission offsets) be obtained from existing sources; and that there will be reasonable further progress toward achievement of the NAAQS. The major source threshold for a new source is 50 tpy of NOx or 50 tpy of VOC emissions. The Massachusetts NNSR program is implemented under 310 CMR 7.00, Appendix A.

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Table 13 - Worst Case Year Annual Emissions Estimates Compared with NNSR Thresholds

Pollutant	Estimated Worst Case Annual Emissions (tpy)	NNSR Threshold (tpy)	NNSR Triggered?
NOx	320	50	Yes
VOC	19.2	50	No

There are two main elements to an NNSR permit. Sources are required to offset their NNSR pollutant emissions prior to actually emitting the NNSR pollutant(s) and must comply with the LAER for all stationary emission units. This windfarm exceeds the major source threshold for NOx, and therefore must perform a LAER analysis as well as fulfill other NNSR requirements, as described below.

A. Lowest Achievable Emission Rate

As defined in 310 CMR 7.00, Appendix A, LAER means, for any source, the more stringent rate of emissions based on the following:

> (a) The most stringent emissions limitation which is contained in any state SIP for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or
> (b) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. . . . In no event shall LAER allow a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable pursuant to applicable new source standards of performance.

See 310 CMR 7.00, Appendix A, § 2. As defined by CAA § 171(3), the term "lowest achievable emission rate" means for any source, that rate of emissions which reflects:

> (a) the most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable, or
>
> (b) the most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent.

The LAER requirement does not consider economic, energy, or other environmental factors. *See* In re Three Mountain Power, LLC, 10 E.A.D. 39, 48 n.9 (2001) (quoting New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting (draft Oct. 1990), at G.4.

Although the definitions for LAER and BACT are different, they share many common traits. For example, paragraph (a) of the definition for LAER is addressed within Steps 1 and 2 of a BACT analysis. Step 1 of the BACT analysis requires the identification of all emission control

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technologies that are possible for the sources, including technologies used to comply with the most stringent emission limit in a state SIP.[46] Step 2 of the BACT analysis requires the permitting authority, in this case the EPA, to document why, if true, a particular control technology is infeasible and thus not achievable, for that source category.

Paragraph (b) of the definition for LAER is addressed in Step 3 of a BACT analysis, where the different control technologies are ranked by control effectiveness; thereby the technology required for LAER will be ranked at the top. Where LAER and BACT determinations diverge is in Step 4 of a BACT analysis, where based on an evaluation of energy, environmental and economic impacts, the EPA can remove a technology from consideration. For LAER determinations, when determining the emission limit and identifying at least one technology that can be used to achieve the emission limit, the EPA does not account for the energy, environmental, or economic impacts associated with that technology.

In applying LAER, EPA first considered the BACT analysis for WTGs, the OSS, and vessels operating as OCS sources as reviewed in Section V. of this Fact Sheet. Many technologies were eliminated as unavailable or infeasible in the marine environment. The remaining feasible technology after Step 2 of the BACT analysis was ultimately carried through to Step 5. Therefore, in EPA's analysis of LAER for SFW, any single technology remaining after Step 2 of the BACT analysis would also be considered LAER, because energy, environmental, and economic considerations impacting the selections would only be evaluated in Step 4 of a BACT analysis, and those considerations did not preclude the technology from selection. Additionally, the LAER determination for SFW is consistent with what was included in Vineyard Wind 1's permit.

1. Engines on WTGs and OSS

As summarized in Section V.B.3, EPA determined all technologies or control strategies for engines installed on the OSS and WTGs other than those specified as BACT to be unachievable. Therefore, LAER is determined to be a combination of good combustion practices, reducing idling where possible, and the Tier 4 engine requirements in 40 C.F.R. part 1039 for the new diesel-powered electric generators on the WTGs and the OSS. For emergency engines, the operation limitations shall be restricted as outlined in the NSPS.

2. Engines on Vessels Operating as OCS Sources

As summarized in Section V.B.4, the EPA determined that all technologies or work practices, except for use of the highest tiered engine at the "time of deployment" specified as BACT, are technologically infeasible for vessels meeting the definition of an OCS source. Thus, LAER is determined to be the use of the highest tier internal combustion engine available to SFW at the time of deployment. Also, as stated earlier in Section V, the CA SIP requires defined vessel categories to meet 40 C.F.R. part 94 Tier 2 standards. The draft permit specifically defines *Feeder Jack-up Vessel, Supply Vessel, and Secondary Crew Transfer Vessel* was to ensure the emission limits in the draft permit are at least as stringent as the CA SIP.

[46] The CA SIP requires defined vessel categories to meet 40 C.F.R. part 94 Tier 2 standards.

B. Offsets

The project involves two distinct phases, each phase requiring a different offset type (i.e., emission reduction credit or "ERC"). Emissions during the construction phase for the project will end when construction and commissioning is completed and thus these emissions are considered "one-time" emissions, meaning they will not continue out into the future. The type of emission credits used for offsetting one-time emissions are usually referred to as a discrete emission reduction credit (DERC).[47] Under 310 CMR 7.00, Appendix B, these credits are referred to as mass-based ERCs. The unit used to define a DERC or mass-based ERC is simply tons, to recognize that the emission credit can only be used one-time to offset emissions occurring in just one year.

The second phase of the project will involve emissions that are anticipated to occur every year the windfarm operates. To offset these types of emissions, a different type of emission credit is required, one that ensures that the annual emissions will be offset for each and every future operating year in which the emissions will occur. This type of emission credit, sometimes referred to as a NNSR offset, a continuous ERC (CERC), or simply an ERC, is referred to as a rate-based ERC in 310 CMR 7.00, Appendix B. The unit used to define a rate-based ERC is tons per year, to recognize that the emission credit can offset yearly emissions that will occur each and every operating year of the source.

Offsets for both the construction and operational phases are subject to the adjustment factor of 1.2:1 required in 310 CMR 7.00, Appendix A, Section 6.e.1. Additionally, 310 CMR 7.00, Appendix B, Section 3.e.2 requires that persons seeking to use ERCs from the Massachusetts ERC bank must obtain an amount of credit equal to five percent more than the amount needed for the offset calculation, i.e., a 1.26:1 offset ratio. Based on the potential emissions of the project, the maximum offsets anticipated for the construction and operation phases are contained in Table 8.

Table 8. Maximum NOx Offsets Needed for Construction and Operation Phases of Project (assuming a 1.26:1 offset ratio)

Project Phase	NOx Emissions	NOx Offsets Needed	Units
Construction	320	403	tons
Operation and Maintenance	19.2	24.2	tons per year

SFW can obtain offsets, both mass-based and rate-based, in the following manners:

- Purchasing ERCs identified in the Massachusetts ERC bank which have been created in accordance with 310 CMR 7.00, Appendix B. Appendix B allows companies to certify emission reductions by over-controlling their emissions, shutting down emission units or entire facilities, or taking enforceable restrictions on their operations that lead to emission

[47] *See* EPA Guidance "Improving Air Quality with Economic Incentive Programs" dated January 2001, at https://www.epa.gov/sites/production/files/2015-07/documents/eipfin.pdf, last visited on January 14, 2021 and included as part of the permit record.

reductions. 310 CMR 7.00, Appendix B was approved into the Massachusetts state implementation plan on August 8, 1996. *See* 61 FR 41355, and thus ERCs in the Massachusetts ERC bank are federally enforceable;

- Enter into a third-party agreement that requires the third-party to lower its emissions. Such an agreement would need to be made federally enforceable prior to issuance of the final permit for SFW; or
- From a facility that has ceased operations and had its CAA permits revoked or rescinded and has not had the resulting emissions reductions certified under the Massachusetts trading bank regulations under 310 CMR 7.00, Appendix B. Offsets obtained in this manner must be memorialized in a document from the Commonwealth of Massachusetts to ensure that the offsets from such a shutdown are fully in compliance with the CAA and have not been relied on by Massachusetts to meet other CAA requirements. Once the offsets are used by a source pursuant to this option, the offsets would be retired and would no longer be available to be used by another company, or by the Commonwealth in meeting another CAA requirement.

EPA is applying the requirement in 310 CMR 7.00, Appendix B, Section 3.e.2 to offsets obtained from the Massachusetts ERC bank in accordance with 310 CMR 7.00, Appendix B. Therefore, SFW is required to obtain offsets at a 1:26 to 1 ratio for NOx emissions from the project if the offsets are obtained from the Massachusetts ERC bank. If offsets are obtained by another mechanism outside of the Massachusetts ERC Bank, they are subject to a 1:2 to 1 ratio as required by 310 CMR 7.00, Appendix A, section (6)(e)(1). The maximum amount of offsets required based on a ratio of 1:26 to 1 are shown in Table 8 above.

NNSR offsets are required to be obtained from sources within the same nonattainment area or may be obtained from another area if two criteria are met. *See* 310 CMR 7.00, Appendix A(6)(b). Based on 2014 emission data from the EPA's National Emission Inventory database, total anthropogenic NOx emissions in Dukes County was 1034 tons. Due to the lack of availability of potential NOx offsets (i.e., ERCs) within the Dukes County 2008 ozone nonattainment area, the EPA anticipates that SFW will obtain NNSR offsets using ERCs from another classified area. The two criteria that must be met when obtaining NNSR offsets from another classified area are:

1. The other area has an equal or higher nonattainment classification than the area in which the source is located; and

2. Where the proposed new source or modified source is located in a nonattainment area, emissions from such other area contribute to a violation of a national ambient air quality standard in the nonattainment area in which the proposed new or modified source would construct.

Areas within the OTR are required to meet the requirements of a moderate nonattainment area, regardless of whether the area is classified as marginal nonattainment or unclassifiable/attainment. Even though all areas within Massachusetts, outside of Dukes County,

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were designated unclassifiable/attainment for the 2008 ozone standard,[48] NNSR offsets from sources within Massachusetts meet the first criterion since all of the Commonwealth is required to meet the nonattainment requirements of a moderate nonattainment area.[49]

The second criterion requires a demonstration that emissions from the other area contributes to a violation of the ozone standard within Dukes County.[50] Based on recent air dispersion modeling that EPA conducted to assist states with their ozone transport analysis for the 2015 ozone NAAQS, sources within Massachusetts are projected to contribute 10.54 ppb ozone in Dukes County in 2023.[51]

Therefore, with both criteria met, the EPA is determining that SFW can obtain offsets from anywhere within Massachusetts. If SFW were to obtain offsets from another state, an analysis similar to the one contained within this document for areas within Massachusetts would need to be performed and submitted to the EPA and concurred upon prior to relying on those offsets for compliance with offset obligations.

Almost all NOx emissions for purposes of determining the required NNSR offset totals are generated from third-party vessels. At the time of the draft permit, SFW and the EPA are not aware of the exact engines that are installed and will be operating on these third-party vessels. Without specific engine information, the methodology for determining daily NOx emissions is challenging – emissions tracking is needed to capture the total emissions from any of the vessels that may be used at any time. Therefore, EPA has determined that daily NOx emissions tracking is necessary for demonstrating compliance with the requirement for SFW to obtain sufficient NNSR offsets prior to construction and for SFW to be able to account for those offsets every quarter. SFW will need to have offsets equal to or greater than the amount required by 310 CMR 7.00, Appendix A prior to when the actual emissions occur. (*See* Section IX. of this Fact Sheet for a summary of monitoring, reporting, and recordkeeping provisions related to offset requirements.)

The EPA acknowledges that the methodology in the draft permit for calculating daily NOx emissions is conservative and potentially overestimates daily emissions of each pollutant. The draft permit's proposed methodology for determining daily NOx emissions involves the following records and measurements:

1. Requiring SFW to document the Tier standard the engine's manufacturer certified each engine to meet. Knowing the Tier standard the engine is certified to meet allows the Permittee and the EPA to determine the emission factor of a given pollutant in g/kW-hr that the engine will emit while operating;

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[48] All of Massachusetts is designated attainment/unclassifiable for the 2015 ozone standard, a standard that is more stringent than the 2008 ozone standard. *See* 40 C.F.R. § 81.322.

[49] The EPA notes that 310 CMR 7.00, Appendix A requires new or modified sources of NO_x and VOC to meet the requirement of NNSR as if the source were being located in a serious nonattainment area.

[50] The EPA determined that Dukes County attained the 2008 ozone standard by the July 20, 2015 attainment date (*See* 81 FR 26697, May 4, 2016).

[51] *See* https://www.epa.gov/airmarkets/memo-and-supplemental-information-regarding-interstate-transport-sips-2015-ozone-naaqs, last visited on May 14, 2019. The 2015 NAAQS Interstate Transport Assessment Design Values and Contributions spreadsheet can be found in the docket.

2. Nameplate information for each engine. This data at a minimum should include the engine's manufacturing date, rated maximum power, the number of cylinders, and the overall engine displacement;

3. Record whether the engines are on a foreign or domestically flagged vessel;

4. Hours of operation when operating within 25 nautical miles of the OCS source; and

5. When using the alternative method for an engine's load factor that relies on actual fuel used while operating within 25 nautical miles of the OCS source, SFW must obtain and keep a record of the manufacturer's performance specification data for each engine that is used to calculate engine load based on fuel usage.

Even with the above information, further assumptions must be made when determining daily NOx emissions. These assumptions are:

1. Emission factors for some Tier certified engines combine NOx and VOC into one emission limit. When this is presented, the EPA has calculated a NOx/VOC ratio based on the total potential NOx and VOC emissions for the OCS source to determine g/kW-hr for NOx.

2. Some engines on vessels may not be certified to either an IMO or EPA standard. In this case, the EPA is relying on emission data from EPA's Draft Regulatory Impact Analysis: Control of Emissions from Compression-Ignition Marine Engines, dated November 1998, for determining NOx emission factors.[52]

3. If fuel usage data and manufacturer's performance specification data is unavailable, SFW will use a default value of 0.69 as the engine's load factor. This number is based on the weighted average engine load when a manufacturer certified an engine meets EPA's Tier emission limits. *See* 40 C.F.R. §94.105(b), Table B and 40 C.F.R. part 1042, Appendix II, section (a)(1).

C. Alternative Site Analysis

The location of the Rhode Island/Massachusetts Wind Energy Area comprises two original larger lease areas OCS-A-0486 and OCS-A-0487. A portion in the North Lease area of OCS-A-0486 (now OCS-A-0517) will be where the South Fork Wind Farm is located. The lease area auction and siting decisions by BOEM were the result of a multi-year effort by state and federal regulatory agencies to identify OCS areas suitable for offshore renewable energy development.

As SFW notes in Section 5.2.3 of the revised application, alternative siting considerations are addressed extensively in BOEM approving the surrounding lease areas for the industry as outlined in the COP for the project. There are four distinct alternatives considered as part of this process: 1) a "no build" alternative; 2) alternative sites; 3) a smaller sized buildout; and 4) alternative production processes and environmental control techniques. EPA finds that SFW sufficiently satisfied the requirements of the alternative site analysis for the purposes of NNSR

[52] *See* https://nepis.epa.gov/Exe/ZyPDF.cgi/P1004N1J.PDF?Dockey=P1004N1J.PDF, last visited on January 20, 2021 and included in the docket.

and 310 CMR 7.00, Appendix A, Section (8)(b) for this project by relying on the analysis outlined in the COP that weighed the necessary environmental, economic, cultural and social factors and determined the best location for this project in light of those factors.

D. Compliance at Other Facilities

SFW meets this requirement; SFW does not own or operate any other major stationary sources in Massachusetts.

VII. Other COA Emission Control Requirements

As previously stated, the COA for the windfarm is the Commonwealth of Massachusetts. Thus, the WA facility is subject to applicable provisions of the Massachusetts air pollution control regulations which are codified at 310 CMR 4.00 (Timely Action Schedule and Fee Provisions), 6.00 (Ambient Air Quality Standards for the Commonwealth of Massachusetts), 7.00 (Air Pollution Control), and 8.00 (The Prevention and/or Abatement of Air Pollution Episode and Air Pollution Incident emergencies). These Massachusetts regulations are incorporated by reference in 40 C.F.R. part 55, Appendix A. This section identifies which Massachusetts regulations incorporated into Appendix A apply to the windfarm, including the vessels that meet the definition of an OCS vessel and which regulations result in terms and condition(s) specified in permit number OCS-R1-04.

A. 310 CMR 7.02: Plan Approval and Emission Limitations

The WA facility must meet the requirements for a comprehensive plan approval (CPA) under 310 CMR 7.02(5)(a)(7). To comply with a CPA, Massachusetts' regulations indicate that a best available control technology (BACT) analysis, using a top-down approach, is the preferred approach or one of a number of other enumerated approaches that may be proposed by an applicant. *See* 310 CMR 7.02(8)(a)(2).

Project emissions for PM_{10}, SO_2, CO, and VOC fall below PSD applicability thresholds but above thresholds for sources subject to Massachusetts minor NSR permitting and thus require a BACT analysis[53], whereas emissions for lead fall below Massachusetts' permitting and plan approval thresholds.[54] Therefore, further BACT requirements derived from Massachusetts's regulations apply for PM_{10}, SO_2, CO, and VOC. Massachusetts BACT requirements are similar to federal requirements in that the same five-step elimination of air pollution control technologies and strategies is performed to arrive at the selected emission limit for the project, as

[53] 310 CMR 7.02(8)(a)(2) stipulates that a BACT analysis per state guidance is required for all plan approvals, i.e. comprehensive and limited plan approvals covering either major and minor sources emitting above the "significance" threshold for an air pollutant.

[54] In Massachusetts, a comprehensive plan approval is required for "any facility where the construction, substantial reconstruction, alteration or subsequent operation would result in an increase in potential emissions of a single air contaminant equal to or greater than ten tons per year, calculated over any consecutive 12-month time period." *See* 310 CMR 7.02(5)(a)(1). A limited plan approval is required for "any facility where the construction, substantial reconstruction, alteration or subsequent operation would result in an increase in potential emissions of a single air contaminant equal to or greater than one ton per year and less than ten tons per year, calculated over any consecutive 12-month time period." *See* 310 CMR 7.02(4)(a).

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described in earlier in Section V.B. In some cases, sources may be subject to a "top case BACT" emission limit[55] where the technology has been demonstrated to be effective for a source from the same industrial sector in the state. Notably, the Massachusetts BACT guidance encourages consideration of all control technologies and strategies that include best management practices, pollution prevention, and a limitation on the hours of operation and/or raw material usage. For unique sources such as this windfarm, EPA does not believe the Massachusetts guidance to select "top case BACT" should be applied, and EPA is alternatively applying the top-down BACT determination process for PM_{10}, SO_2, CO and VOC in the same manner as described in Section V.3 and V.4. *See* 310 CMR 7.02(8)(a)2.c.

Massachusetts regulations applicable to the OCS source, incorporated through the consistency update process as described in Section III.B, contain requirements for source registration, VOC in paint or sealant, fuel content, opacity and smoke density and tube or soot removal activities from vessels.

1. PM_{10} State BACT

There are no feasible add-on controls outside of those inherent as part of the design of a tier certified engine to reduce PM_{10} emissions from this source – although used in other contexts, diesel oxidation catalysts and particulate filters are not considered feasible for constructing the windfarm because the technology can cause back pressure in the engine, posing a safety hazard in a marine environment. Massachusetts BACT for PM_{10} is satisfied through applicable NSPS and NESHAP standards (40 C.F.R. 60 Subpart IIII for diesel fired CI engines, 40 C.F.R. 60 Subpart JJJJ for gasoline fired engines and 40 C.F.R. 63 Subpart ZZZZ) for engines on the WTGs and OSS outlined in Section V.B.3 and the BACT standard to use the highest tiered vessels available at the "time of deployment" outlined in Section V.B.4.

2. SO_2 State BACT

No add-on controls were identified to reduce SO_2 emissions from the source. Although many fuel types, including natural gas may theoretically be used in the construction and operation of this windfarm, marine distillate and marine residual fuel are the only technically feasible options for internal combustion engines operating on or as OCS sources. Marine distillate fuel typically has lower sulfur content than marine residual fuel. Ultra-low sulfur diesel (ULSD) may not always be available or allowed to be used in certain marine vessels due to the lower flash point, which raises a safety concern, when compared to other fuels. Sulfur content in fuel may be restricted to using ULSD when available, such as for the engines installed on the WTGs and OSS. BACT is therefore using fuel with the lowest sulfur content available. Otherwise, Massachusetts BACT for SO_2 is satisfied through use of good engineering practices (e.g. regular and effective maintenance) for the engines and the standard to use the highest tiered vessels available at the "time of deployment".

[55] *See* MassDEP's "Top Case Best Available Control Technology (BACT) Guidelines" at https://www.mass.gov/doc/top-case-bact-guidelines/download.

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3. CO State BACT

There are no feasible add-on controls to reduce CO emissions from this source. Massachusetts BACT for CO is satisfied through applicable NSPS and NESHAP standards (40 C.F.R. 60 Subpart IIII for diesel fired CI engines, 40 C.F.R. 60 Subpart JJJJ for gasoline fired engines and 40 C.F.R. 63 Subpart ZZZZ) for engines on the WTGs and OSS outlined in Section V.B.3 and the BACT standard to use the highest tiered vessels available at the "time of deployment" outlined in Section V.B.4.

4. VOC State BACT

A combination of engine preventative maintenance and limiting idling, where possible, as well as the use of low VOC paints and sealants during construction and operation of the project was selected to satisfy Massachusetts BACT for VOC.

B. 310 CMR 7.05: Fuels All Districts

310 CMR 7.05(1)(a)(1) limits the amount of sulfur content by weight in fuel. Because BACT for SO_2 was based on the lowest available sulfur content fuel and has been incorporated into the draft permit, this provision of the Commonwealth's regulations is considered subsumed by the regulation that requires SO_2 BACT.

C. 310 CMR 7.06: Visible Emissions

This section of the Commonwealth's regulations limits the opacity and smoke density from the engines. These requirements have been incorporated into the draft permit. Because BACT for PM_{10} was based on the selection of control technologies that limit particulate matter and have already been incorporated into the draft permit, this provision of the Commonwealth's regulations is considered subsumed by the regulation that requires BACT.

D. 310 CMR 7.11: Transportation Media

This section of the Commonwealth's regulations prohibit tube blowing or other soot removal activities from vessels within the WA facility.

E. 310 CMR 7.12: Source Registration

This section of the Commonwealth's regulations requires owners/operators of facilities to submit an annual source registration to Massachusetts. The annual source registration includes detailed emission estimates for air pollutants.

F. 310 CMR 7.18: Volatile and Halogenated Organic Compounds

Subsection 30 of this regulation (Adhesives and Sealants) limits VOCs in adhesive, sealant, adhesive primer, or sealant primer that will be used for the WA facility. Because BACT for VOC requires minimizing VOC emissions through appropriate use of adhesives, sealants and primers,

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this provision of the Commonwealth's regulations is considered subsumed by the regulation that requires VOC BACT.

VIII. Other Federal Requirements

NSPS regulations for stationary sources in 40 C.F.R. part 60 Subpart IIII and JJJJ regulations set forth air emission standards for both emergency and non-emergency engines that may be used for this project. The engines that will be used in the construction and operation of this project include propulsion engines that will be used to power vessels as well as stationary engines used on equipment on the vessels, which typically will be only non-emergency engines. Non-emergency engines will primarily be used for this project. NESHAP requirements in 40 C.F.R. part 63 Subpart ZZZZ will be incorporated into the draft permit to the extent that they apply.

A. New Source Performance Standards

1. Engines Located on a WTG or OSS

Forty C.F.R. § 55.13(c) states:

> "40 C.F.R. Part 60 (NSPS) shall apply to OCS sources in the same manner as in the COA, except that any source determined to be an existing source pursuant to § 55.3(e) of this part shall not be considered a "new source" for the purpose of NSPS adopted before December 5, 1991."

As described in Section V for BACT and VI for LAER, all internal combustion engines located on a WTG or OSS are required to meet 40 C.F.R. part 60, subpart IIII. For the purposes of determining which emission limit is applicable to these internal combustion engines, the date that construction commences is the date the engine is ordered by the original owner or operator. For engines defined as emergency engines, the operation limitations are restricted as outlined in the NSPS and further limited to operating 200 hours per year.

2. Engines Located on a Vessels Operating as OCS Sources

40 C.F.R. §60.4201(f)(2) allows the owner or operator to use engines certified to the domestic marine standards in 40 C.F.R. parts 94 and 1042. As shown in Section V for BACT and VI for LAER, the EPA is requiring all engines on most vessels when those vessels are operating within the definition of an OCS source to meet the standards for marine engines in either 40 C.F.R. part 94, part 1042 or, if vessels are subject to the MARPOL protocol, the engines may be certified to standards in part 1043. All marine engines operating on a foreign vessel while that vessel meets the definition of an OCS source shall be certified as meeting the applicable emission limits for IMO or EPA Tier 1, 2, or 3 marine engines, depending upon whichever IMO or EPA Tier the marine engine is certified to meet, and additionally, the draft permit requires certain defined vessel categories to meet 40 C.F.R. part 94 Tier 2 standards.

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B. National Emission Standards for Hazardous Air Pollutants

All internal combustion engines located on a vessel, while the vessel meets the definition of an OCS source, and all engines located on WTGs and the OSS, are considered stationary sources. Forty C.F.R. § 55.13(e) states:

> "40 C.F.R. part 61, together with any other provisions promulgated pursuant to section 112 of the Act, shall apply if rationally related to the attainment and maintenance of Federal or State ambient air quality standards or the requirements of part C of title I of the Act."

In promulgating 40 C.F.R. part 63, subpart ZZZZ, the EPA established that hazardous air pollutant emissions from engines (i.e., internal combustion engines) are rationally related to the attainment and maintenance of Federal or State ambient air quality standards. *See* 78 FR 6674 (January 30, 2013).

The EPA is determining that all internal combustion engines operating on OCS sources are subject to 40 C.F.R. part 63, subpart ZZZZ. The draft permit associated with this document contains the requirements from 40 C.F.R. part 63, subpart ZZZZ applicable to the windfarm.

IX. Monitoring, Reporting, Recordkeeping and Testing Requirements

There are three types of reports required by the associated draft permit. These are:

- Self-reporting (i.e., prompt reporting) of deviations from permit terms and conditions. The EPA is requiring the prompt reporting of permit deviations as a condition of the preconstruction permitting requirements of the draft permit.

- Quarterly reports will be submitted to the EPA. The draft permit associated with this document contains the exact information that must be submitted.

- By January 31st of each year, SFW must submit an annual certification that provides for the status of compliance with the terms and conditions of the permit for the previous calendar year. The EPA is requiring the annual certification as a condition of the preconstruction permitting requirements of the draft permit.

Demonstrating compliance with the permit requires robust monitoring and recordkeeping of activities. The monitoring, recordkeeping, and testing requirements can be grouped into several categories. These categories are:

- Tracking, on a daily basis, the actual NOx emissions from all OCS sources and vessels servicing or associated with the OCS source while at or going to or from an OCS source while within 25 nautical miles of the OCS source. This tracking is necessary to ensure SFW will have offsets equal to or greater than the amount required by 310 CMR 7.00, Appendix A prior to when the actual emissions occur.

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- Documenting key design parameters and manufacturers' certifications for every internal combustion engine and any other air emitting unit on an OCS source. This information is necessary to demonstrate compliance with the BACT and LAER emission limits.

- Work practice standards for 40 C.F.R. part 63, subpart ZZZZ.

- Certifying that at the time a vessel will become an OCS source, the vessel in question has the least polluting internal combustion engines on it available to SFW or its contractors.

- Demonstrating compliance with the sulfur in fuel limits by obtaining the fuel supplier's certificate that contains information regarding the fuel's sulfur content.

- Demonstrating compliance with the opacity standards for internal combustion engines for jack-up vessels when those jack-up vessels are operating as OCS sources.

X. Consultations

For the purposes of the Endangered Species Act (ESA), Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), and the National Historic Preservation Act (NHPA), the issuance of an OCS air permit is a federal action undertaken by the EPA. The BOEM is the lead federal agency for authorizing renewable energy activities on the OCS and the South Fork windfarm is also a federal action for the BOEM. The BOEM's regulations at 30 C.F.R. part 585 require SFW to obtain a COP approval before commencing construction on the windfarm. In conjunction with the COP approval, the BOEM is also responsible for issuing the Record of Decision (ROD) on the Environmental Impact Statement conducted under the National Environmental Policy Review Act (NEPA).

The applicant requests a lease, easement, right-of-way, and any other related approvals from BOEM necessary to authorize construction, operation and eventual decommissioning of the proposed action. BOEM's authority to approve, deny, or modify the project derives from the Energy Policy Act of 2005. Section 388 of the Act amended the Outer Continental Shelf Lands Act by adding subsection 8(p), which authorizes the Department of the Interior to grant leases, easements or rights-of-way on OCS lands for activities that produce or support production, transportation, or transmission of energy from sources other than oil and gas, such as wind power.

The EPA assesses its own permitting action (i.e., to issue an OCS air permit for the windfarm) as interrelated to, or interdependent with, the BOEM's COP approval and issuance of the NEPA ROD for the South Fork windfarm. Accordingly, the EPA has designated the BOEM as the lead Federal agency for purposes of fulfilling statutory obligations under the aforementioned statutes.[56] The BOEM has accepted the designation as lead Federal agency.[57]

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[56] A copy of the July 25, 2018 letter from EPA R1 to the BOEM regarding lead agency designation is included in the administrative record for this action.
[57] A copy of the September 24, 2018 letter from the BOEM to EPA R1 accepting lead agency designation is included in the administrative record for this action.

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A. Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, and National Historic Preservation Act

Under Section 7(a)(2) of the ESA, 16 U.S.C. § 1536(a)(2), the EPA must ensure that any action authorized, funded, or carried out by the EPA is not likely to jeopardize the continued existence of any federally listed endangered species or threatened species or result in the destruction or adverse modification of such species' designated critical habitat. If the EPA's action (i.e., OCS air permit issuance) may affect a federally listed species or designated critical habitat, Section 7(a)(2) of the ESA and relevant implementing regulations at 50 C.F.R. part 402 require consultation between the EPA and the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service (NMFS), depending on the species and/or habitat at issue.

In accordance with Section 305(b)(2) of the MSFCMA, 16 U.S.C. § 1855(b)(2), Federal agencies are also required to consult with the NMFS on any action that may result in adverse effects to essential fish habitat (EFH).

Section 106 of the NHPA, 16 U.S.C. 470f, and the implementing regulations at 36 C.F.R. part 800 require federal agencies to consider the effect of their actions on historic properties and afford the opportunity for the Advisory Council on Historic Preservation (ACHP) and consulting parties to consult on the federal undertaking.

The ESA regulations at 50 C.F.R. § 402.07, the MSFCMA regulations at 50 C.F.R. § 600.920(b), and the NHPA regulations at 36 C.F.R. § 800.2(a)(2) provide that where more than one federal agency is involved in an action, the consultation requirements may be fulfilled by a designated lead agency on behalf of itself and the other involved agencies. As previously discussed, the BOEM is the designated lead agency for the purposes of fulfilling EPA's obligations under Section 7 of the ESA, Section 305(b) [of the] MSFCMA, and Section 106 of the NHPA for offshore wind development projects on the Atlantic OCS, including the project. As a result of this designation, BOEM will consider the effects of the EPA's OCS permitting action in fulfilling its consultation obligations under each of these statutes for the NEPA ROD and COP approval process.

At the time of writing this Fact Sheet and the EPA's associated proposal of the draft permit, the BOEM has commenced but not completed its consultation requirements for ESA, MSFCMA, and NHPA for the COP approval and NEPA ROD for the project. The EPA understands that the BOEM will satisfy its statutory obligations as lead federal agency under each of these statutes prior to EPA issuance of a final OCS air permit for the South Fork windfarm. Should the result of BOEM's consultation under one or more of these statutes identify any conditions or restrictions on air emissions for inclusion in the OCS air permit, the EPA will include those conditions or restrictions in the final permit as necessary. The EPA will provide an additional opportunity for public comment regarding any such new conditions or restrictions as necessary and appropriate.

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B. Coastal Zone Management Act

Section 307 of the CZMA, 16 U.S.C. § 1456, and the implementing regulations at 15 C.F.R. part 930 provide a federal consistency process for state programs to use to manage coastal activities and resources and to facilitate cooperation and coordination with federal agencies. Generally, federal consistency requires that federal actions, within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. Federal actions include federal agency activities, federal license or permit activities, and federal financial assistance activities. Federal agency activities must be consistent to the maximum extent practicable with the enforceable policies of a state coastal management program, and license and permit and financial assistance activities must be fully consistent.

Under 15 C.F.R. part 930, subpart D, a non-federal applicant for a federal license or permit is required to provide a state with a consistency certification if the state has identified the federal license or permit on a list of activities subject to federal consistency review in its federally approved coastal management program. State federal consistency lists identify the federal agency, federal license or permit, and federal financial assistance activities that are subject to federal consistency review if the activities occur within a state's coastal zone pursuant to the applicable subparts of the regulations at 15 C.F.R. part 930. The EPA has reviewed the listed federal actions for federal license or permit activities for Massachusetts and Rhode Island. The EPA's action to issue an OCS air permit under the regulations at 40 C.F.R. part 55 is not included on the current list of federal actions for federal consistency review. Thus, issuance of this OCS air permit is not required to be preceded by a federal consistency review.[58]

C. Clean Air Act General Conformity

Pursuant to 40 C.F.R. § 93.153(d)(3), a conformity determination is not required for the portion of an action that includes major or minor new or modified stationary sources that require a permit under the NSR program. Therefore, the project activities accounted for in EPA's permit conform to the Massachusetts SIP.

XI. Environmental Justice

Executive Order (EO) 12898 entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires that federal agencies identify and address, as appropriate and to the extent practicable and permitted by existing law, proportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. *See* Executive Order 12898, Section 1-101, 59 FR 7629 (Feb. 16, 1994). Consistent with EO 12898 and the EPA's "Plan EJ 2014: Considering Environmental Justice in Permitting," the EPA must (1) consider the environmental justice issues, on a case-by-case basis, connected with the issuance of

[58] The EPA confirmed with the State of Rhode Island and the Commonwealth of Massachusetts that the states do not seek a consistency review for OCS air permits. A copy of the email confirmation from Rhode Island and Massachusetts is included in the administrative record for this action.

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federal permits (particularly when permitting projects for major sources that may involve activities with significant public health or environmental impacts on already overburdened communities); and (2) focus on whether the federal permitting action would have disproportionately high and adverse human health or environmental effects on minority or low income populations.

The EPA defines "Environmental Justice" (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA's goal with respect to Environmental Justice in permitting is to enable overburdened communities to have full and meaningful access to the permitting process and to develop permits that address environmental justice issues to the greatest extent practicable under existing environmental laws. Overburdened is used to describe the minority, low-income, tribal, and indigenous populations or communities in the United States that potentially experience disproportionate environmental harms and risks as a result of greater vulnerability to environmental hazards.

In light of Executive Order 12898, the White House Council on Environmental Quality (CEQ) issued Environmental Justice: Guidance Under the National Environmental Policy Act. This guidance includes six principles for environmental justice analyses to determine any disproportionately high and adverse human health or environmental effects to low-income, minority, and tribal populations. The EPA has evaluated these principles with regard to environmental justice for the South Fork windfarm. The principles are:

1. Consider the composition of the affected area to determine whether low-income, minority or tribal populations are present and whether there may be disproportionately high and adverse human health or environmental effects on these populations;
2. Consider relevant public health and industry data concerning the potential for multiple exposures or cumulative exposure to human health or environmental hazards in the affected population, as well as historical patterns of exposure to environmental hazards;
3. Recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed action;
4. Develop effective public participation strategies;
5. Assure meaningful community representation in the process, beginning at the earliest possible time; and
6. Seek tribal representation in the process.

A. Air Quality Review

For purposes of Executive Order 12898 on environmental justice, the Environmental Appeals Board has recognized that compliance with the National Ambient Air Quality Standards (NAAQS) is "emblematic of achieving a level of public health protection that, based on the level of protection afforded by a primary NAAQS, demonstrates that minority or low-income

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populations will not experience disproportionately high and adverse human health or environmental effects due to the exposure to relevant criteria pollutants."[59] This is because the NAAQS are health-based standards, designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. The EPA has determined that issuance of this OCS permit will not contribute to NAAQS violations or have potentially adverse effects on ambient air quality. *See* Section V.C of this document for a detailed analysis of the ambient impact analysis of the project.

B. Environmental Impacts to Potentially Overburdened Communities

EPA's EJ Screen tool[60] is an environmental justice screening and mapping tool that utilizes standard and nationally consistent data to highlight places that may have higher environmental burdens and vulnerable populations. In EJ Screen, EPA identifies the 80th percentile for the purpose of identifying geographic areas that may warrant further consideration, analysis, or outreach for environmental justice. CEQ's 1997 guidance document identifies minority populations in an affected environment if (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. The Commonwealth of Massachusetts has more stringent criteria and defines an environmental justice community as one or more U.S. Census block groups that meet one or more of the following criteria: 25 percent of households within the census block group have a median annual household income at or below 65 percent of the statewide median income for Massachusetts; 25 percent or more of the residents are minority; or 25 percent or more of the residents have English Isolation.[61]

Indirect air quality impacts[62] to environmental justice communities were evaluated using a 5km buffer around port and landfall areas that may be affected by project activities with a mapping analysis in combination with EPA's EJ Screen tool in BOEM's Draft Environmental Impact Statement (DEIS) for South Fork.[63] The analysis area includes potentially affected areas of tribal communities. EJ populations, as defined by the more stringent income and minority criteria established under the Commonwealth of Massachusetts' Environmental Justice Policy, exist in the port areas indirectly affected by the project.

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[59] *See* Environmental Appeals Board order *In re Shell Gulf of Mexico, Inc.* & *In re Shell Offshore, Inc.*, 15 E.A.D. 103, 156 (December 30, 2010). A copy of the order can be found in the administrative record for this action.

[60] EJSCREEN is an environmental justice mapping and screening tool that provides the EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. More information on EPA's EJ Screen tool is available at https://www.epa.gov/ejscreen.

[61] *See* Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs. Available at: https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy_0.pdf. Last accessed February 18, 2021.

[62] For the purposes of this discussion, indirect air quality impacts are those that are caused by activities such as onshore construction, staging of materials, and emissions from vessels associated with the construction and operation of SFW. These emissions are not directly regulated by EPA's CAA OCS permit and are outside the regulatory authority of EPA within the context of CAA OCS permitting.

[63] A copy of BOEM's January 2021 DEIS for the South Fork project can be found in the administrative record for this action.

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The direct air quality impacts[64] during the construction phase of the project are temporary and would last less than two years. Direct air quality impacts from ongoing project activities regulated by this permit are localized around the WA facility and insignificant in all onshore areas. Over time, the development of offshore wind, a renewable and non-emitting energy source, on the Atlantic Coast is expected to displace fossil-fuel fired generation of electricity and improve air quality in the region, in turn reducing adverse health impacts to EJ communities in the area. BOEM performed a simulation with EPA's Avoided Emissions and Generation tool (AVERT) for the New York region which estimated avoided emissions of offshore wind displacing fossil fuel generators are 4,846 to 6,236 tons NOx per year, 2,526 to 3,244 tons SOx per year and 732 to 943 tons PM2.5 per year.[65]

The project is subject to BACT and LAER emission limits as well as the requirement to obtain offsets in advance under the PSD and NNSR permitting programs. Thus, the emissions generating activities at the source will be controlled by compliance with the OCS air permit. In other words, emissions control and NNSR offset requirements in the air permit minimize air pollutant emissions. The emissions generated during the operation phase of the windfarm engines would be very low and the engines are certified to meet EPA emissions standards. In addition, work practice standards that will be employed during the construction and operation of the project include minimizing the idling of the engines of the vessels; and the use of ultra-low sulfur diesel whenever possible to minimize sulfur and particulate emissions. The EPA notes that some of the emissions generated by the engines associated with the vessels' engines, which will depart from and return to the ports would occur near shore. These emissions would add a small amount to the current vessel traffic emissions in the area, and, given their very low-level and very short duration, would have minor (if any) human health or environmental effects on the overall population, including any minority or low-income population.

C. Tribal Consultation and Enhanced Public Participation

Per the EPA Policy on Consultation and Coordination with Indian Tribes, the EPA Region 1 offers tribal government leaders an opportunity to consult on all OCS air permit actions. On February 8, 2020, the EPA notified the tribes in Massachusetts, Rhode Island, Connecticut and the Shinnecock Indian Nation in Long Island, New York that they will be provided the opportunity to conduct government-to-government consultation prior to issuing the OCS air permit.[66] To date the EPA has not received a request from any tribe requesting consultation on this permit action. However, the tribes may request consultation at any time.

In order to comply with Section 5-5(c) ("Public Participation and Access to Information") of EO 12898, which requires that each federal agency work to ensure that public documents, notices, and hearings relating to human health or the environment are concise, understandable, and readily accessible to the public, the EPA has prepared a Public Notice, available on the EPA website at https://www.epa.gov/caa-permitting/caa-permitting-epas-new-england-region.

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[64] For the purposes of this discussion, direct air quality impacts are those that are regulated by EPA's CAA OCS permit and include emissions associated with OCS sources, WTGs, and the OSS.
[65] *See* Table 3.3.1-3 in Appendix H of the South Fork DEIS.
[66] Letters offering government-to-government consultation to each of the affected tribes are included in the administrative record for this air permit action.

Interested parties can also subscribe to an EPA email list that notifies them of public comment opportunities in Region 1 for proposed air pollution control permits via email at https://www.epa.gov/caa-permitting/caa-permitting-epas-new-england-region. In addition, the EPA will hold a virtual public hearing for this permit action. These procedures, along with this Fact Sheet and Statement of Basis, will ensure an opportunity for meaningful involvement for all communities, including potentially impacted environmental justice communities.

XII. Comment Period, Hearings and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, in writing. Due to the COVID-19 emergency, EPA prefers that all comments be submitted by electronic means to

Undine Kipka
kipka.undine@epa.gov

If email submittal of comments is not feasible, hard copy comments may be submitted to the address below.

Undine Kipka
Air and Radiation Division (Mail code: 05-2)
U.S. EPA Region 1
5 Post Office Square, Suite 100
Boston, MA 02109

Comments may also be submitted electronically through https://www.regulations.gov (Docket ID **#EPA-R01-OAR-2021-0392**).

A public hearing will be held during the public comment period. See the public notice for details. The EPA will consider requests for extending the public comment period for good cause. In reaching a final decision on the Draft Permit, the EPA will respond to all significant comments and make these responses available upon request.

Following the close of the public comment period, and after the public hearing, the EPA will issue a Final Permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of issuance of the final permit decision, any eligible parties may submit a petition for review of the final permit decision to the EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

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XIII. EPA Contacts

Additional information concerning the draft permit may be obtained from:

Undine Kipka
Telephone: (617) 918-1335
Email: kipka.undine@epa.gov

All supporting information regarding this permitting action can also be found on EPA's website at https://www.epa.gov/caa-permitting/epa-issued-caa-permits-region-1 or at www.regulations.gov Docket ID #**EPA-R01-OAR-2021-0392**.

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