UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

November 23, 2022

MEMORANDUM

SUBJECT: Model Clearinghouse review of an alternative model application of AERCOARE in conjunction with AERMOD in Support of Outer Continental Shelf PSD air permitting of the Coastal Virginia Offshore Wind-Commercial wind power project

FROM: George Bridgers, Model Clearinghouse Director
Air Quality Modeling Group, Air Quality Assessment Division
Office of Air Quality Planning and Standards

GEORGE BRIDGERS
Digitally signed by GEORGE BRIDGERS
Date: 2022.11.23 14:36:53 -05'00'

TO: Timothy A. Leon Guerrero, Meteorologist
Air Analysis Branch, Air and Radiation Division
EPA Region 3, Philadelphia, Pennsylvania

Alice Chow, Branch Chief
Air Analysis Branch, Air and Radiation Division
EPA Region 3, Philadelphia, Pennsylvania

INTRODUCTION

Dominion Energy Virginia (Dominion) has proposed the construction of an offshore wind energy farm off the coast of Virginia in the Commercial Lease of Submerged Lands for Renewable Energy Development on the OCS Offshore Virginia (Lease No. OCS-A-0483). The Coastal Virginia Offshore Wind-Commercial (CVOW-C) wind farm project is projected to generate between 2,500 and 3,000 megawatts of offshore wind energy. Dominion's preferred buildout design scenario for the CVOW-C project includes up to 176 wind turbine generators, 3 offshore substations, up to 484 km of inter-array cabling, and up to 9 buried submarine high-voltage alternating-current offshore export cables.

The CVOW-C project emissions are anticipated to be greater than the Prevention of Signification Deterioration (PSD) major source thresholds of 250 tons per year (tpy) for CO, NO_X, and VOC during construction, and 75,000 tpy for GHGs during construction. The estimated CVOW-C project emissions are also expected to be greater than 250 tpy for NO_X during operation. The Project will therefore be considered a PSD major source during both construction and operation, with significant emissions of CO, NO_X, VOC, PM, PM_{10}, $PM_{2.5}$, SO_2, and GHGs. As a result, air quality modeling will be conducted for CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2 to demonstrate

compliance with the National Ambient Air Quality Standards (NAAQS) and appropriate PSD Increments.

Dominion has requested to use an alternative model, as provided in Section 3.2 of the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W), to conduct its PSD air quality modeling analysis.[1] Specifically, Dominion has requested to use the Coupled Ocean-Atmosphere Response Experiment (COARE) bulk flux algorithm, as implemented in the AERCOARE meteorological data preprocessor program, to prepare meteorological data for use in the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) dispersion program in lieu of the preferred Offshore and Coastal Dispersion (OCD) model to assess ambient impacts in a marine environment.[2]

REGIONAL OFFICE REVIEW

The U.S. Environmental Protection Agency (EPA) Region 3 seeks concurrence from the EPA's Model Clearinghouse (Model Clearinghouse or MCH) regarding the prospective EPA Region 3 approval of an alternative model for the compliance demonstration requirements of Dominion's CVOW-C wind farm project. As noted above, the AERCOARE meteorological data preprocessor program will be used in conjunction with AERMOD (AERCOARE-AERMOD) to conduct an air quality modeling analysis as part of the OCS air permit application for the proposed CVOW-C project. Dominion is seeking approval to allow the use of the coupled AERCOARE-AERMOD alternative model methodology or approach for their air quality modeling analysis, under the *Guideline*, Section 3.2.2(b), Condition (3).

EPA Region 3 has conducted a thorough review of Dominion's request and has found the proposed application of the alternative model to be satisfactory and addresses the requirements of the *Guideline*, Section 3.2.2(b), Condition (3), including the subsequent five elements contained in Section 3.2.2(e). As such, pursuant to the *Guideline*, Sections 3.0(b) and 3.2.2(a), Region 3 currently intends to approve the use of proposed coupled AERCOARE-AERMOD alternative model approach for the CVOW-C project air permit application.

MODEL CLEARINGHOUSE REVIEW

The specifics of the EPA Region 3 review and the basis for their intention to approve the proposed AERCOARE-AERMOD alternative modeling approach for the CVOW-C wind farm project are presented in detail in the EPA Region 3 alternative model concurrence request memorandum submitted to the Model Clearinghouse on October 25, 2022.[3] Given the similarities in scope and almost identical points of justification made by Dominion to several other Model Clearinghouse actions over the past few years regarding the use of the coupled AERCOARE-AERMOD alternative model approach, we will not reiterate each aspect of the

[1] https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-III-01_20220930-CVOWC_EPA_Model_Clearinghouse_Request_Rev01_Clean-Submittal.pdf.

[2] The OCD dispersion model is listed in Section 4.2.2.3 of the *Guideline* as the Environmental Protection Agency's preferred model for over-water modeling.

[3] https://gaftp.epa.gov/Air/aqmg/SCRAM/mchisrs/22-III-01_Region3_MCHRequest_CVOWC.pdf.

Regional Office review in this concurrence response memorandum.[4] The Model Clearinghouse affirms the Region 3 conclusion that circumstances surrounding and the alternative model request package submitted for the CVOW-C project follows a nearly identical pathway to these previously EPA approved alternative models.

The Model Clearinghouse continues to agree with the technical merits of this common themed alternative model justification for the coupled AERCOARE-AERMOD approach as long as there is an appropriate level of consultation with the Regional Office on the manner in which the alternative model will be applied in the air quality modeling analysis for the project's OCS air permit application, including an assessment of potential concerns with platform downwash and shoreline fumigation. The Model Clearinghouse encourages reviewers of this alternative model concurrence to reference the EPA Region 3 alternative model concurrence memorandum for specific details of EPA Region 3's review of the Dominion alternative model request and justification.

CONCURRENCE SUMMARY

The Model Clearinghouse concurs with EPA Region 3's proposed approval of a coupled AERCOARE-AERMOD alternative modeling approach for the air quality modeling analysis required in the Coastal Virginia Offshore Wind-Commercial wind farm project based the alternative model request package provided by Dominion Energy Virginia and the review documentation in the alternative model concurrence request memorandum provided by EPA Region 3. The Model Clearinghouse encourages EPA Region 3 to respond to Dominion and to the docket for federal permitting actions related to the CVOW-C project with a letter of alternative model approval, as appropriate. The information associated with the EPA Region 3 alternative model approval and the Model Clearinghouse concurrence should be available for comment during the appropriate public comment period(s).

Given the possible importance of platform downwash and shoreline fumigation, the Model Clearinghouse continues to recommend caution and careful review before additional alternative model considerations of the coupled AERCOARE-AERMOD model methodology in other projects. This case-specific Model Clearinghouse concurrence does not constitute a generic approval of a coupled AERCOARE-AERMOD approach for other applications elsewhere. However, the scope of the technical assessment submitted here and with similar AERCOARE-AERMOD alternative model requests continue to provide a good basis for such considerations.

For any future projects considering the use of a coupled AERCOARE-AERMOD approach, including differing phases of a project to which those phases were not considered as part of a previous EPA alternative model approval, EPA Regional Office approval with Model Clearinghouse concurrence is required per the *Guideline*, Section 3.2. Early consultation with the

[4] Please reference the EPA Model Clearinghouse Information Storage and Retrieval System (MCHISRS) database for more information regarding recent AERCOARE-AERMOD alternative model reviews and approvals:
https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=22-I-01
https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=22-I-02
https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=22-II-01
https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=22-II-02
https://cfpub.epa.gov/oarweb/MCHISRS/index.cfm?fuseaction=main.resultdetails&recnum=19-VI-01.

appropriate reviewing authority and EPA Regional Office is always strongly recommended for any alternative model application other than the preferred OCD model approach for overwater or OCS sources.

cc: Richard Wayland, C304-02
Scott Mathias, C504-01
Tyler Fox, C439-01
Rochelle Boyd, C504-03
EPA Air Program Managers
EPA Regional Modeling Contacts