



ENVIRONMENTAL PROTECTION AGENCY

[EPA-HQ-OAR-2020-0351; FRL-10018-10 -OAR]

Ozone Transport Commission Recommendation that EPA Require Daily Limits for Emissions of Nitrogen Oxides from Certain Sources in Pennsylvania

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of Public Hearing and Supplemental Information.

SUMMARY: The Environmental Protection Agency (EPA) is issuing this notice of public hearing and supplemental information regarding a recommendation submitted by the Ozone Transport Commission (OTC) to address ongoing ozone pollution in the northeastern United States. The OTC has recommended that EPA require Pennsylvania to revise its state implementation plan (SIP) to include additional control measures that would establish daily limits on emissions of nitrogen oxides (NO_x) from coal-fired electricity generating units (EGUs) with already-installed selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) controls. According to the recommendation, the additional control measures are to ensure that the SCR and SNCR controls are optimized to minimize NO_x emissions each day of the ozone season (May 1 through September 30), and the measures must be as stringent as any one of several specified state rules already approved into the SIPs of Delaware, Maryland, and New Jersey. This notice discusses the relevant provisions of the Clean Air Act (CAA or the Act), summarizes the recommendation and the supporting information submitted by the OTC, and provides additional information that EPA believes may be relevant in reaching a decision on the recommendation. This notice also announces the date of a public hearing and opens a public comment period on the recommendation, the supporting information provided by the OTC, and the additional information being provided by EPA.

DATES: EPA will hold a virtual public hearing on **[INSERT DATE 18 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Please refer to <https://www.epa.gov/interstate-air-pollution-transport/ozone-transport-commission-otc-section-184c-recommendation> for additional information on the public hearing, including registration procedures. Comments must be received on or before **[INSERT DATE 51 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2020-0351, at <https://www.regulations.gov>. Once submitted, comments cannot be edited or removed from the docket. EPA may publish any comment received to its public docket. Do not submit to EPA's docket at <https://www.regulations.gov> any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit <https://www.epa.gov/dockets/commenting-epa-dockets>. Please note that to reduce the risk of transmitting COVID-19, written comments submitted by mail are temporarily suspended, no hand deliveries will be accepted, and EPA is temporarily suspending access to its Docket Center and Reading Room for public visitors. Additional materials related to this action, including submitted comments, can be viewed online at [regulations.gov](https://www.regulations.gov) under Docket ID No. EPA-HQ-OAR-2020-0351. Our Docket Center staff will continue to provide remote customer service via email, phone, and webform. For further information and updates on EPA Docket Center services, please visit us online at <https://www.epa.gov/dockets>.

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SUPPLEMENTARY INFORMATION: This document concerns a recommendation submitted by the OTC to EPA under CAA section 184(c). In section I, EPA discusses the relevant statutory provisions. Section II describes the steps EPA is following to facilitate public participation in the Agency's process for reaching a decision on the recommendation. In Section III, EPA discusses the OTC recommendation, including the Delaware, Maryland, and New Jersey rules that OTC believes should become the standards for EPA's approval of a responsive SIP revision from Pennsylvania. In section III, EPA also identifies the potentially affected Pennsylvania EGUs, and summarizes the supporting information provided by the OTC. Sections IV and V provide additional information on the potentially affected EGUs' historical emissions and on regulatory context that may be relevant to EPA's decision on the recommendation.

EPA is holding a public hearing on the recommendation as required by section 184(c) and is also taking comment on the recommendation, the supporting information submitted by the OTC, and the additional information provided by EPA.

I. Statutory Provisions

A. Summary of CAA Section 184

Ground-level ozone is a secondary air pollutant created by chemical reactions between the ozone precursor pollutants NO_x and volatile organic compounds (VOC) in the presence of sunlight. Precursor pollutant emissions can be transported downwind directly or, after transformation in the atmosphere, as ozone. Studies have established that ozone formation, atmospheric residence, and transport can occur on a regional scale (i.e., across hundreds of miles) over much of the eastern U.S.¹

The Ozone Transport Region (OTR) was established by operation of law under CAA section 184 and comprises the states of Connecticut, Delaware, Maine,² Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont, the District of Columbia, and the portion of

¹ For example, Bergin, M.S. et al. (2007). Regional air quality: Local and interstate impacts of NO_x and SO₂ emissions on ozone and fine particulate matter in the eastern United States. *Environmental Sci. & Tech.* 41: 4677–4689.

² On February 20, 2020, Maine petitioned EPA under CAA section 176A(a) for removal of certain areas of the state from the OTR. EPA has not yet acted on the petition.

Virginia that is within the Consolidated Metropolitan Statistical Area that includes the District of Columbia.

Under CAA section 184(a), the Administrator established a commission for the OTR, the OTC, consisting of the Governor of each state or their designee, the Administrator or their designee, the Regional Administrators for the EPA regional offices affected (or the Administrator's designees), and an air pollution control official representing each state in the region, appointed by the Governor. Section 184(b) sets forth certain control measures that OTR states are required to include in their SIPs, including enhanced vehicle inspection and maintenance in certain metropolitan statistical areas and implementation of reasonably available control technology (RACT) for certain sources of VOC and NO_x³ in the state.

CAA section 184(c) specifies a procedure for the OTC to develop recommendations for additional control measures to be applied within all or a part of the OTR if the OTC determines that such measures are necessary to bring any area in the OTR into attainment with national ambient air quality standards (NAAQS) for ozone by the applicable attainment deadlines. Section 184(c)(1) provides that:

Upon petition of any states within a transport region for ozone, and based on a majority vote of the Governors on the Commission (or their designees), the Commission may, after notice and opportunity for public comment, develop recommendations for additional control measures to be applied within all or a part of such transport region if the Commission determines such measures are necessary to bring any area in such region into attainment by the dates provided by [subpart II of part D of CAA title I].

Section 184(c) also lays out procedures the Administrator is to follow in responding to recommendations from the OTC. After receipt of the recommendations, the Administrator is to immediately publish a **Federal Register** notice stating that the recommendations are available and is to provide an opportunity for a public hearing within 90 days. The Administrator is also to "commence a review of the

³ CAA section 184(b) requires RACT for sources of VOC in OTR states and CAA section 182(f)(1) extends the requirement for RACT to major sources of NO_x.

recommendations to determine whether the control measures in the recommendations are necessary to bring any area in such region into attainment by the dates provided by [subpart II] and are otherwise consistent with [the Act].” Finally, in undertaking the review, the Administrator is to consult with members of the OTC and is to consider the data, views, and comments received pursuant to the public hearing.

CAA sections 184(c)(4) and (5) govern EPA’s response to the OTC recommendations. Under section 184(c)(4), the Administrator is to determine whether to approve, disapprove, or partially approve and partially disapprove the recommendations within nine months of receipt. For any disapproval or partial disapproval, the Administrator is to specify:

- (i) Why any disapproved additional control measures included in the recommendation are not necessary to bring any area in such region into attainment by the dates provided by [subpart II] or are otherwise not consistent with the Act; and
- (ii) Recommendations concerning equal or more effective actions that could be taken by the commission to conform the disapproved portion of the recommendations to the requirements of [section 184].

Section 184(c)(5) provides that, upon approval or partial approval of any recommendations, the Administrator is to issue, to each state in the OTR to which an approved requirement applies, a finding under CAA section 110(k)(5) that the SIP for that state is inadequate to meet the requirements of CAA section 110(a)(2)(D), often referred to as the “good neighbor provision.” Section 110(a)(2)(D) provides, in pertinent part, that each state’s SIP shall contain adequate provisions:

- (i) Prohibiting, consistent with the provisions of [CAA title I], any source or other type of emissions activity within the state from emitting any air pollutant in amounts which will—
- (I) Contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any [NAAQS].

Under section 184(c)(5), the Administrator's finding of inadequacy under section 110(a)(2)(D) is to require that each affected state revise its SIP to include the approved additional control measures within one year after the finding is issued.

B. Judicial Interpretation of CAA Section 184(c)

EPA has taken action under CAA section 184(c) once before. On February 10, 1994, the OTC submitted a recommendation under the section that EPA require all states in the OTR to adopt a Low Emission Vehicle (LEV) program equivalent to the LEV program already adopted by California. After proposing to approve the recommendation and soliciting public comment, EPA published a final action approving the OTC's recommendation and issuing a SIP call that required each OTR state either to adopt the LEV program or to adopt other measures of the state's choosing that would achieve a level of NO_x emission reductions identified by EPA. 60 FR 4712 (Jan. 25, 1995). In the final action, EPA took the position that authority to promulgate these requirements was provided independently by both CAA section 184(c) and CAA section 110. *Id.* at 4716-18.

On review, the U.S. Court of the Appeals for the District of Columbia Circuit (D.C. Circuit) vacated EPA's action. *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997). Although the court's decision ultimately rested on other grounds, the court interpreted certain aspects of CAA section 184(c), in part by contrasting it with CAA section 110. The court first determined that, as a practical matter, the SIP call mandated adoption of the LEV program because the purported alternative allowing states to adopt other control measures was so much less attractive that it was, in the court's view, "no alternative at all." 108 F.3d at 1404. The court then explained that because section 110 does not authorize EPA to condition approval of a state's SIP on the adoption of specific control measures chosen by EPA, section 110(k)(5) alone could not provide authority for a SIP call requiring adoption of the LEV program. *Id.* at 1410. The court then considered whether section 184(c), in contrast to section 110, would allow EPA to condition approval of a state's SIP upon the adoption of specific control measures and concluded that the language of section 184(c) "answers with an emphatic yes." *Id.* However, because the court also found that other CAA provisions – specifically, CAA sections 177 and 202 – barred EPA from requiring states to adopt the LEV

program at that time, the court vacated the SIP call without regard to whether issuance of the SIP call otherwise would have been within EPA's authority under section 184(c). *Id.* at 1411-13.⁴

C. Options for Action on a CAA Section 184(c) Recommendation

After the OTC submits a recommendation to EPA, under CAA section 184(c)(4) the Administrator may approve, disapprove, or partially approve and partially disapprove the recommendation. The section's requirement that, in conjunction with a disapproval or partial disapproval, EPA must identify "equal or more effective actions that could be taken by the commission to conform the disapproved recommendation to [CAA section 184]" suggests that EPA does not have authority to simply adopt such conforming modifications on its own initiative as part of an action otherwise approving the recommendation. We interpret these provisions as limiting the Agency's ability to modify or supplement an OTC recommendation, except insofar as EPA may partially approve and partially disapprove the recommendation. Consistent with the court's discussion in *Virginia*, this statutory interpretation recognizes that, under CAA section 110, EPA generally does not have authority to require states to include particular control measures in their SIPs, and that section 184(c) provides a limited exception to this general principle only with respect to control measures that have been specifically recommended to EPA by the OTC in accordance with statutory procedures.

EPA requests comment on this interpretation of its options for action on the OTC's recommendation.

EPA also requests comment on the standard that should be applied in acting on the OTC's recommendation. CAA sections 184(c)(2)(B) and (c)(4)(i) provide that EPA is to determine whether the OTC's recommended additional control measures are "necessary to bring any area in [the OTR] into attainment by the [areas' attainment dates]." However, CAA section 184(c)(5) states that where the EPA approves or partially approves the OTC's recommendation, the Administrator is to issue a finding under CAA section 110(k)(5) that the state at issue (here, Pennsylvania) has an implementation plan

⁴ Because its decision rested on other grounds, the court found it unnecessary to resolve other claims challenging EPA's authority under CAA section 184(c), including claims – contested by EPA – that the section is unconstitutional because of the role assigned to the OTC. 108 F.3d at 1410.

inadequate to meet the requirements of CAA section 110(a)(2)(D). In effect, this would be a determination that the plan does not contain adequate provisions prohibiting emissions in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to a NAAQS. EPA invites comment on how it should interpret these provisions in order to ensure consistent treatment throughout the section 184(c) process.

II. Public Notice and Participation under CAA Section 184(c)

As noted in section I.A of this document, CAA section 184(c)(1) requires the OTC to provide notice and an opportunity for public comment on any recommendations for additional control measures to be applied within all or part of the OTR. After the OTC transmits such recommendations to EPA, EPA is to publish a notice stating that the recommendations are available, hold a public hearing, consult with members of the OTC, conduct a review of the OTC recommendation, and issue an approval, disapproval, or partial approval and partial disapproval of the recommendation within nine months of receiving the recommendation. CAA section 184(c)(1)-(4). The CAA requires that EPA publish its determination in the **Federal Register**.

The provision also requires that EPA “shall take into account the data, views, and comments received” pursuant to its notification of the available recommendation and the public hearing. EPA is in this notice providing information the Agency has developed and that it is considering in light of the OTC’s recommendation, and we are providing an opportunity for the public to submit comments on the OTC’s recommendation and this information by **[INSERT DATE 51 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. This opportunity to comment is in addition to the statutorily mandated public hearing.⁵

Specifically, EPA seeks public comments on the OTC’s recommendation; the information the OTC submitted to EPA in support of its recommendation, consisting of certain technical analyses and a

⁵ We note that in EPA’s only prior action on a section 184(c) recommendation in 1994-1995, the Agency elected to employ CAA section 307(d) rulemaking procedures in acting on the OTC’s recommendation, but stated that it was not legally obligated to do so. See 80 FR 21270, 21274 (Apr. 26, 1994).

summary of OTC's response to the comments submitted to the OTC; and the information EPA is providing in this document and in other materials referenced in this document and included in the docket established for this action.

As discussed elsewhere in this document, EPA is considering several issues in determining whether to approve or disapprove the OTC recommendation and invites comments on all these issues. In addition to providing the opportunity to file written comments and present oral views at the **[INSERT DATE 18 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** hearing, EPA intends to consult with the affected states as required by section 184(c)(3) prior to making a final decision on the recommendation. If EPA approves or partially approves the OTC's recommendation, per CAA section 184(c)(5), the Agency shall issue a finding under CAA section 110(k)(5), also known as a SIP call, that the implementation plan for such state is inadequate to meet the requirements of CAA section 110(a)(2)(D).

III. Discussion of the OTC's Recommendation

A. The OTC's Section 184(c) Recommendation for NO_x Limits on Certain Pennsylvania EGUs

In 2015, EPA revised the NAAQS for ozone to 70 parts per billion (ppb). 80 FR 65292 (October 28, 2015). In 2018, EPA designated certain areas as nonattainment with respect to this NAAQS and identified each area's classification according to the severity of its air quality problems. 83 FR 25776 (June 4, 2018). Five areas within the OTR were designated as nonattainment: Baltimore, MD; Greater Connecticut, CT; Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE; Washington, DC-MD-VA; and New York-Northern New Jersey-Long Island, NY-NJ-CT. *Id.* The first four of these areas were classified as Marginal and the New York area was classified as Moderate. *Id.* The attainment deadlines for the Marginal and Moderate areas are three and six years after the effective date of their nonattainment designations, or August 3, 2021 and August 3, 2024, respectively. 83 FR 10376 (March 9, 2018).

On May 30, 2019, Maryland petitioned the OTC to adopt a recommendation calling for additional control measures to be applied within part of the OTR. In response to Maryland's petition, the OTC commenced a notice-and-comment process that culminated in a June 3, 2020 vote by a majority of OTR

states to submit a recommendation to EPA under CAA section 184(c).⁶ EPA received the recommendation on June 8, 2020 and published a notice in the **Federal Register** of the availability of the recommendation on July 13, 2020 (85 FR 41974). The recommendation itself is published as an appendix to this document, and the recommendation as well as the supporting materials submitted to EPA by the OTC are available in the docket.

The OTC has recommended that EPA require Pennsylvania to revise its SIP to establish daily NO_x emissions limits for coal-fired EGUs with existing SCR or SNCR controls to ensure optimization of the controls to minimize NO_x emissions each day of the ozone season. The recommendation calls for the new Pennsylvania requirements to be as stringent as the requirements in any one of certain existing rules adopted by Delaware, Maryland, and New Jersey that were incorporated by reference into the recommendation. Each of the referenced rules was intended to establish some form of daily NO_x control requirements for the respective state's coal-fired EGUs. The recommendation requests that EPA require Pennsylvania to implement the requested control measures as expeditiously as practicable.⁷ The OTC recommendation did not address sources other than coal-fired EGUs in Pennsylvania.

The OTC highlighted four main reasons for making the recommendation. First, several areas in the OTR are not expected to attain the 2015 ozone NAAQS by 2021, the statutory deadline for areas classified as Marginal. If the areas do not attain by the deadline, they will be reclassified (*i.e.* "bumped up") and subject to more stringent requirements. Additionally, there are still some areas that have not attained the 2008 ozone NAAQS. The OTC's second line of reasoning points to research showing that large regional NO_x reductions lower peak ozone across the eastern U.S. and that additional NO_x reductions are needed for attainment of the 2008 and 2015 ozone NAAQS. Third, the OTC references EPA information identifying emissions from Pennsylvania as contributing to downwind nonattainment and

⁶ The supporting materials submitted by the OTC include documentation that notice-and-comment procedures were followed. See Part 3 of Attachment 2, "Policy and Technical Rationale Supporting OTC's Recommendation for Additional Control Measures Under CAA Section 184(c)," and Attachment 3, "Response to Comments Received on OTC 184(c) Recommendation," available in the docket.

⁷ The recommendation also specifically requests that EPA require Pennsylvania to establish daily NO_x limits for the 2020 and 2021 ozone seasons.

includes estimates developed by Maryland of additional NO_x reductions from Pennsylvania EGUs that could be achieved through daily NO_x limits. Finally, the OTC states that it decided to use the CAA section 184(c) process after a collaborative process resulted in some states adopting daily NO_x limits, while Pennsylvania, with the largest NO_x emissions from coal-fired EGUs of any state in the OTR, has not.

In the cover letter accompanying the recommendation, the OTC recognizes that Pennsylvania has a regulatory process underway to update its RACT requirements for the EGUs that are the subject of the recommendation (Pennsylvania calls the planned requirements “RACT III”). Pennsylvania has periodically provided the OTC with information on the progress and components of the RACT III regulatory process.

The OTC’s letter states that the OTC will withdraw the CAA section 184(c) recommendation if Pennsylvania adopts final RACT III requirements that address the recommendation.

B. Pennsylvania Units Affected by the Recommendation

EPA has identified the operating Pennsylvania coal-fired EGUs (including units that combust coal refuse) that are believed to have already installed SCR controls (10 units) or SNCR controls (8 units) and that therefore would be affected by a full approval of the OTC’s recommendation. Table III-1 lists the units and indicates for each unit the associated generator capacity, boiler type, and NO_x control type as well as NO_x mass emissions and NO_x emission rate for the 2019 ozone season. In Table III-2, EPA lists operating Pennsylvania coal-fired EGUs that are believed not to have already installed SCR or SNCR controls. The two tables exclude units that are believed to have either retired or permanently discontinued coal combustion.

EPA requests comment on whether the Pennsylvania units that would be affected by a full approval of the OTC’s recommendation have been correctly identified.

Table III-1. Pennsylvania Operating Coal-fired EGUs with SCR or SNCR Controls [†]

Unit	Generator summer capacity (MW)	Boiler type	Post-combustion NO _x controls	2019 ozone season NO _x emissions (tons)	2019 ozone season NO _x emission rate (lb/mmBtu)
Cheswick unit 1	565	Tangential	SCR	331	0.192
Colver unit AAB01	110	Fluidized bed	SNCR	309	0.157
Conemaugh unit 1	850	Tangential	SCR	1,350	0.132

Conemaugh unit 2	850	Tangential	SCR	1,719	0.149
Homer City unit 1	623	Dry bottom wall	SCR	504	0.106
Homer City unit 2	633	Dry bottom wall	SCR	465	0.107
Homer City unit 3	650	Dry bottom wall	SCR	456	0.089
Keystone unit 1	850	Tangential	SCR	1,778	0.136
Keystone unit 2	850	Tangential	SCR	1,368	0.134
Montour unit 1	752	Tangential	SCR	143	0.101
Montour unit 2	752	Tangential	SCR	120	0.106
Northampton unit NGC01	112	Fluidized bed	SNCR	12	0.075
Panther Creek unit 1	83 ^{††}	Fluidized bed	SNCR	3	0.123
Panther Creek unit 2	83 ^{††}	Fluidized bed	SNCR	5	0.116
Scrubgrass unit 1	85 ^{††}	Fluidized bed	SNCR	52	0.118
Scrubgrass unit 2	85 ^{††}	Fluidized bed	SNCR	53	0.131
Seward unit 1	521 ^{††}	Fluidized bed	SNCR	107	0.095
Seward unit 2	521 ^{††}	Fluidized bed	SNCR	91	0.088
Totals / Wtd. average (all units)	8,286			8,866	0.129
Totals / Wtd. average (SCR-equipped units)	7,375			8,233	0.130

[†] Data sources: EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD) and EIA Form 860. “Coal-fired” EGUs include units combusting coal refuse. Several of the units report “ammonia injection” controls which EPA interprets as SNCR controls.

^{††} This generator is served by multiple boilers.

Table III-2. Pennsylvania Operating Coal-fired EGUs Without SCR or SNCR Controls [†]

Unit	Generator summer capacity (MW)	Boiler type	Post-combustion NO _x controls	2019 ozone season NO _x emissions (tons)	2019 ozone season NO _x emission rate (lb/mmBtu)
Brunner Island unit 1 ^{††}	306	Tangential	none	176	0.121
Brunner Island unit 2 ^{††}	363	Tangential	none	115	0.103
Brunner Island unit 3 ^{††}	742	Tangential	none	283	0.109
Ebensburg unit 031	50	Fluidized bed	none	83	0.079
Gilberton unit 031	80 ^{†††}	Fluidized bed	none	62	0.071
Gilberton unit 032	80 ^{†††}	Fluidized bed	none	62	0.072
Mt. Carmel unit SG-101	43	Fluidized bed	none	23	0.069
St. Nicholas unit 1	86	Fluidized bed	none	110	0.052
Westwood unit 031	30	Fluidized bed	none	61	0.132
Totals / Wtd. average	1,700			976	0.090

[†] Data sources: EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD) and EIA Form 860. “Coal-fired” EGUs include units combusting coal refuse.

^{††} Reported data indicate that this unit combusted primarily natural gas during the 2019 ozone season.

^{†††} This generator is served by multiple boilers.

C. Referenced State Rules for Delaware, Maryland, and New Jersey

As noted in section III.A of this document, the OTC’s recommendation calls for EPA to require

Pennsylvania to adopt requirements into its SIP that are at least as stringent as the requirements in

referenced state rules adopted by Delaware, Maryland, or New Jersey.⁸ Following approval or partial approval of the OTC’s recommendation, EPA would be required to issue a SIP call, and Pennsylvania would be required to submit a responsive SIP revision within one year. In order to approve the SIP revision, if EPA were to approve the recommendation in full, EPA would then need to determine whether the requirements adopted by Pennsylvania in response to the resulting SIP call in fact are at least as stringent as the requirements previously adopted by one of the other three states. These three referenced rules are therefore important components of the OTC’s recommendation, because the rules provide the only benchmark for comparison against which EPA would determine the approvability of a future submission from Pennsylvania. In this section, EPA summarizes the relevant provisions of the Delaware, Maryland, and New Jersey state rules and requests comment on how EPA would use the rules as standards for determining whether a SIP revision submitted by Pennsylvania is approvable.

1. Delaware

The Delaware rule referenced in the OTC’s recommendation is 7 DE Admin. Code 1146, Electric Generating Unit (EGU) Multi-Pollutant Regulation. Section 4.3 requires each existing coal-fired and residual oil-fired EGU with a nameplate capacity rating of 25 MW or more to limit its NO_x emission rate to 0.125 lb/mmBtu on a 24-hour rolling average basis. The rule does not differentiate among EGUs based on the type of boiler or control technology and contains no exceptions based on load levels or particular operating conditions (such as start-up or shut-down). Delaware has one operating coal-fired EGU. The unit is equipped with SCR controls.

Table III-3. Delaware Operating Coal-fired EGUs[†]

Unit	Generator summer capacity (MW)	Boiler type	Post-combustion NO _x controls	2019 ozone season NO _x emissions (tons)	2019 ozone season NO _x emission rate (lb/mmBtu)
Indian River unit 4	410	Dry bottom turbo	SCR	48	0.082

[†] Data sources: EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD) and EIA Form 860.

⁸ EPA has already approved the three referenced state rules into the respective states’ SIPs. See Delaware SIP approval (73 FR 50723, Aug. 28, 2008; 75 FR 48566, Aug. 11, 2010); Maryland SIP approval (82 FR 24546, May 30, 2017); New Jersey SIP approval (83 FR 50506, Oct. 9, 2018).

2. Maryland

The Maryland rule referenced in the OTC's recommendation is COMAR 26.11.38, Control of Nitrogen Oxide Emissions from Coal-Fired Electric Generating Units. Maryland's rule establishes requirements that vary across units as well as groups of units under common ownership, with differences that appear to reflect factors including boiler type, control technology, and other characteristics of individual units.

One of Maryland's operating coal-fired EGUs is a fluidized bed boiler equipped with SNCR controls. Section .03D(2) requires this unit to limit its NO_x emissions to 0.10 lb/mmBtu on a 24-hour block average basis without any exceptions based on load levels or operating conditions (such as start-up or shut-down). There is little overlap between the requirements established for this unit and the requirements established for other Maryland coal-fired EGUs under the referenced rule.

Maryland's seven other operating coal-fired EGUs are tangentially fired or dry bottom wall-fired boilers, six of which are equipped with SCR and one of which is equipped with another type of ammonia-based post-combustion NO_x control.⁹ For these units, the rule establishes a multi-part set of ozone season requirements. First, section .03A(1) requires the owner of each unit to submit for approval a plan addressing how the unit's NO_x controls will be operated under various possible operating conditions. Second, section .03A(2) requires each of these EGUs "to minimize NO_x emissions by operating and optimizing the use of all installed pollution control technology and combustion controls consistent with the technological limitations, manufacturers' specifications, good engineering and maintenance practices, and good air pollution control practices for minimizing emissions (as defined in 40 CFR § 60.11(d)) for such equipment and the unit at all times the unit is in operation while burning any coal." Third, section .03B(1) limits owner-level average NO_x emission rates to 0.15 lb/mmBtu on a 30-day rolling average basis. (Depending on the owner's choice of compliance options for its units without SCR controls under section .04, the owner-level 30-day rolling average emission rate limit may be phased

⁹ Chalk Point unit 2 is equipped with selective autocatalytic reduction (SACR) controls. SACR controls use simultaneous injections of ammonia and hydrocarbons (e.g., natural gas) to create a catalytic chemical reaction that reduces NO_x without a separate catalyst. See <https://www.nsenenergybusiness.com/features/featuresacr-promises-low-nox-at-low-cost/> (March 5, 2002).

down to 0.09 lb/mmBtu by 2020.) Fourth, section .03C incorporates a set of unit-level and owner-level caps on ozone season NO_x mass emissions established under COMAR 26.11.27. Fifth, section .04 requires that by June 1, 2020 each coal-fired unit not already equipped with SCR controls (except the fluidized bed unit) either install SCR controls, retire, switch to natural gas combustion, or, in conjunction with the owner's other units, meet either an owner-level daily NO_x emission rate limit of 0.13 lb/mmBtu or an owner-level daily cap on NO_x mass emissions of 21 tons.¹⁰

Finally, in addition to the plans, operational standards and limits, and control requirements of the rules, section .05 establishes compliance demonstration requirements, including detailed daily reporting requirements that apply for days on which affected units exceed specified benchmark 24-hour block average NO_x emission rates. For the SCR-equipped units, each unit is assigned a unit-specific benchmark NO_x emission rate of 0.07 or 0.08 lb/mmBtu, one unit is also assigned a second unit-specific benchmark rate of 0.15 lb/mmBtu that applies at lower load levels, and one unit is also assigned an alternative facility-wide benchmark rate in conjunction with a co-located unit that does not have SCR controls. For the units not equipped with SCR controls (except the fluidized bed unit), each unit is assigned a unit-specific benchmark rate ranging from 0.24 to 0.34 lb/mmBtu and several units are also assigned alternative facility-wide benchmark rates. Section .05A(4) generally provides that exceedances of the benchmark NO_x emission rates are not violations of the requirement under section .03A(2) to operate and optimize installed controls as long as the owner has followed its approved plan for operating and optimizing the controls under section .03A(1).

Table III-4. Maryland Operating Coal-fired EGUs [†]

Unit	Generator summer capacity (MW)	Boiler type	Post-combustion NO _x controls	2019 ozone season NO _x emissions (tons)	2019 ozone season NO _x emission rate (lb/mmBtu)
Brandon Shores unit 1	635	Dry bottom wall	SCR	235	0.064
Brandon Shores unit 2	638	Dry bottom wall	SCR	299	0.065
Chalk Point unit 1 ^{**}	333	Dry bottom wall	SCR	105	0.133
Chalk Point unit 2 ^{**}	337	Dry bottom wall	SACR	129	0.189
Morgantown unit 1	596	Tangential	SCR	108	0.046

¹⁰ At the time Maryland adopted COMAR 26.11.38, section .04 applied to seven coal-fired units without SCR controls. Chalk Point unit 2 is the only one of these seven EGUs that is still operating as a coal-fired unit.

Morgantown unit 2	609	Tangential	SCR	122	0.039
Wagner unit 3	305	Dry bottom wall	SCR	17	0.069
Warrior Run unit 001	180	Fluidized bed	SNCR	184	0.066
Totals / Wtd. average (all units)	3,633			1,198	0.066
Totals / Wtd. average (SCR-equipped units)	3,116			885	0.060

[†] Data sources: EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD) and EIA Form 860.

^{**} This unit has a proposed retirement date of June 1, 2021. See <https://www.genon.com/genon-news/genon-holdings-inc-announces-retirement-of-chalk-point-coal-units> (August 10, 2020).

3. New Jersey

The New Jersey rule referenced in the OTC's recommendation is N.J.A.C. 7:27-19.4, Control and Prohibition of Air Pollution from Oxides of Nitrogen: Boilers serving electric generating units. Under section 19.4(a), each existing coal-fired EGU is required to limit NO_x emissions during the ozone season to 1.50 lb/MWh.¹¹ Section 19.4(d) incorporates the provisions of N.J.A.C. 7:29-19.15(a), which generally require EGUs to demonstrate compliance with this emission rate limit on a 24-hour block average basis during the ozone season. Under section 19.4(e), emissions occurring during certain start-up and shut-down hours when a unit is not combusting coal may be excluded from the emission rate calculations. The rule does not differentiate among EGUs based on the type of boiler or control technology. New Jersey has three operating coal-fired EGUs, all of which are equipped with SCR controls.

Table III-5. New Jersey Operating Coal-fired EGUs [†]

Unit	Generator summer capacity (MW)	Boiler type	Post-combustion NO _x controls	2019 ozone season NO _x emissions (tons)	2019 ozone season NO _x emission rate (lb/mmBtu)
Carneys Point unit 1001	244 ^{**}	Dry bottom wall	SCR	110	0.102
Carneys Point unit 1002	244 ^{**}	Dry bottom wall	SCR	90	0.098
Logan unit 1001	219	Dry bottom wall	SCR	160	0.119
Totals / Wtd. average	463			360	0.108

[†] Data sources: EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD) and EIA Form 860.

^{**} This generator is served by multiple boilers.

¹¹ For units with heat rates of 9,000, 10,000, and 11,000 Btu/kWh, an emission rate limit expressed as 1.5 lb/MWh would be equivalent to emission rate limits expressed as 0.167, 0.150, and 0.136 lb/mmBtu, respectively.

D. Use of the Delaware, Maryland, and New Jersey Rules as Standards for Evaluating a Pennsylvania

SIP Submission

Under the OTC's recommendation, Pennsylvania would be required to revise its SIP to include control measures establishing daily NO_x emission limits that ensure optimization of existing SCR and SNCR controls and that are at least as stringent as the requirements for Delaware, Maryland, or New Jersey EGUs described above. The diversity of the other states' rules provides Pennsylvania with flexibility in designing its responsive SIP revision but the lack of precise specifications for the required additional control measures also raises the possibility that EPA would not have an objectively clear standard for determining whether the SIP revision would in fact comply with the OTC's recommendation.

The Delaware and New Jersey rules – and the Maryland rule as applied to one EGU – establish binding daily NO_x emission rate limits but do not appear to require operation or optimization of installed NO_x controls. Also, the stringencies of the daily NO_x emission rate limits differ across the three states, and the rules do not contain information indicating whether or how the physical or operating characteristics of each state's units might have been considered for purposes of setting the stringency of that state's emission rate limits.

In contrast, Maryland's rule – as applied to all but one of the state's coal-fired EGUs – requires daily operation and optimization of installed NO_x controls but does not establish binding daily NO_x emission rate limits, although it does establish non-binding benchmark daily NO_x emission rates. In addition, while variations in the benchmark rates across units indicate that some unit-specific characteristics were considered when setting those rates, the rule does not contain information indicating how such characteristics were considered.

EPA requests comment on whether the Delaware, Maryland, and New Jersey rules have been accurately summarized in this document. EPA also requests comment on how those rules could be used as standards for evaluating a SIP revision submitted by Pennsylvania, including but not limited to the following questions:

- If Pennsylvania establishes requirements for daily NO_x emission rate limits that are at least as stringent as those in Delaware's rule or New Jersey's rule, could the SIP revision be approved if it does not also establish requirements to operate and optimize installed NO_x controls? Alternatively, if Pennsylvania establishes requirements to operate and optimize controls comparable to Maryland's rule for the majority of its sources, could the SIP revision be approved if it does not also establish binding daily NO_x emission rate limits or benchmark daily NO_x emission rates?
- If Pennsylvania's SIP revision would have to establish binding daily NO_x emission rate limits or benchmark daily NO_x emission rates, could those limits or benchmark rates be higher than the limits or benchmark rates set by Delaware, Maryland, and New Jersey if supported by differences in the physical or operating characteristics of the coal-fired units in the respective states? Conversely, would EPA need to consider whether Pennsylvania could have set limits or benchmark rates lower than the limits or benchmark rates set by the other states based on differences in the units' physical or operating characteristics?
- Are there other ways in which EPA could consider differences in the physical or operating characteristics of Pennsylvania's coal-fired EGUs relative to the other states' EGUs when evaluating a responsive Pennsylvania SIP revision? For example, could EPA approve a SIP revision that exempts or establishes less stringent control requirements for Pennsylvania EGUs whose unit sizes (e.g., MW capacity) or historical emissions fall below the ranges of unit sizes or historical emissions for the other states' units?
- Is EPA's authority under section 184(c) to modify the OTC's recommendation limited such that when evaluating Pennsylvania's responsive SIP revision, EPA may not consider unit-specific characteristics that the OTC did not identify in the recommendation as being potentially relevant?
- Is EPA's authority under section 184(c) to modify the OTC's recommendation limited such that EPA may not establish parameters for Pennsylvania regarding whether specific elements of a responsive SIP revision would (or would not) be consistent with the OTC's recommendation? As one hypothetical example, if EPA approves the OTC's recommendation, would it be permissible under

CAA section 184(c) for EPA to identify a presumption that an approvable SIP would require compliance to be demonstrated on a unit-specific basis rather than through multi-unit averaging, even though the recommendation does not specifically state such a condition?

E. Materials Provided by the OTC to Support the Recommendation

In addition to the recommendation itself (including the Delaware, Maryland, and New Jersey rules discussed in section III.C of this document), the OTC provided two other attachments of materials intended to support the recommendation. In this section, EPA summarizes these supporting materials and requests comment on them.

The first supporting attachment to the OTC's recommendation is entitled "Policy and Technical Rationale Supporting OTC's Recommendation for Additional Control Measures Under CAA Section 184(c)." The attachment includes background information, information intended to document the OTC's compliance with CAA section 184(c)'s procedural requirements, and a statement of the policy rationale summarized in section III.A of this document. In addition, the attachment contains materials intended to serve as technical support for the recommendation, most of which were provided as part of Maryland's 2019 petition to the OTC:

- A table showing, for a subset of ozone monitoring locations across the OTR, preliminary 2017-2019 ozone design values, certified 2018 fourth highest ozone measurements, preliminary 2019 fourth highest ozone measurements, and calculated threshold values for 2020 fourth highest measurements that would result in 2018-2020 design values of 70 ppb or 75 ppb.
- A set of tables showing, for selected dates in the 2017 and 2018 ozone seasons that correspond to ozone exceedances in Maryland, for various individual Pennsylvania coal-fired EGUs and the group of EGUs collectively, the amounts by which these units' reported NO_x emissions exceeded Maryland's estimates of the emissions that would have occurred if the units' daily emission rates had equaled 30-day rolling average emission rates or ozone-season average emission rates achieved by the same units during past ozone seasons in which those units reported their lowest average emission rates (attachment 3 to Maryland's petition).

- A set of tables and charts showing, for selected ozone monitoring locations across the OTR and for each OTR state on average, differences in modeled ozone values between a case where Pennsylvania coal-fired EGUs' emissions were projected to reflect NO_x control performance targets identified by Maryland versus a case where the units' emissions were projected to reflect Maryland's estimates of the units' allowable emissions without additional control measures (attachment 4 to Maryland's petition).
- A table showing, for individual Pennsylvania coal-fired EGUs, the 24-hour block average emission rates and 30-day rolling average emission rates that Maryland proposed as an "Initial Straw-Man Draft" of required control measures to be included in an OTC recommendation (attachment 5 to Maryland's petition).
- A document describing the methodology Maryland followed to develop the tables and charts provided as attachments 3 through 5 to its petition (attachment 6 to Maryland's petition).

The second supporting attachment to the OTC's recommendation is a summary of the OTC's responses to comments that it received in its proceeding to develop the recommendation. One of the responses is a separate document entitled "2017 OTR Ozone Season Exceedances of 2017 NAAQS."¹² This separate document describes an analysis of pollution back-trajectories that the OTC found shows potential connections between the locations of some Pennsylvania EGUs and the locations of some ozone exceedances in the OTR during 2017.

EPA requests comment on the information provided by the OTC to support its recommendation, particularly with respect to the question of whether the information does or does not support a determination by EPA that the control measures included in the recommendation are necessary to bring areas of the OTR into attainment with the 2008 and 2015 ozone NAAQS.

¹² Based on the document's content, it appears that the title contains a typographical error and was intended to reference the 2015 ozone NAAQS.

IV. Historical Emissions Data for Pennsylvania Coal-fired EGUs Potentially Affected by the

Recommendation

To assist in evaluating the OTC's CAA section 184(c) recommendation, EPA has examined historical emissions data for coal-fired EGUs in Pennsylvania as well as Delaware, Maryland, and New Jersey, focusing on the units that continue to operate, as listed in Tables III-1 through III-5 above. With respect to NO_x mass emissions, the data in those tables show that the 18 listed coal-fired EGUs with SCR or SNCR controls in Pennsylvania emitted 8,866 tons of NO_x during the 2019 ozone season, compared to a total of 1,606 tons emitted by the 12 listed units in Delaware, Maryland, and New Jersey, all of which have SCR, SNCR, or comparable controls.¹³

With respect to NO_x emission rates, EPA has focused on comparing SCR-equipped units because the SCR-equipped units are generally larger than the SNCR-equipped units and have historically produced greater amounts of both electricity and NO_x emissions. Table IV-1 shows the weighted average NO_x emission rates for the 2015-2019 ozone seasons for all SCR-equipped coal-fired EGUs that continue to operate in each of the four states. The data indicate that the weighted average emission rates for the Pennsylvania SCR-equipped units were considerably higher than the weighted average rates for the other three states in 2015 and 2016, then declined sharply in 2017. In that year, a more stringent emissions budget for the units in Pennsylvania (as well as Maryland and New Jersey) was implemented under the CSAPR Update, and Pennsylvania units also became subject to more stringent RACT requirements.¹⁴ In 2017 and 2018, the average emission rates for the Pennsylvania units were below the average rate for the New Jersey units but above the average rates for the Delaware and Maryland units. The average emission rate for the Pennsylvania units increased above the average rate for the New Jersey units in 2019 but remained well below 2015-2016 levels.

¹³ The data in Table III-2 show that Pennsylvania coal-fired units without SCR or SNCR controls emitted an additional 976 tons of NO_x in the 2019 ozone season.

¹⁴ The CSAPR Update and Pennsylvania RACT rules are discussed in sections V.A. and V.B. of this document.

Table IV-1. Weighted Average Ozone Season NO_x Emission Rates at Operating SCR-equipped Coal-fired EGUs (lb/mmBtu) [†]

Year	Pennsylvania units	Delaware units	Maryland units	New Jersey units
2015	0.252	0.094	0.059	0.117
2016	0.233	0.078	0.058	0.111
2017	0.099	0.084	0.057	0.112
2018	0.102	0.086	0.064	0.112
2019	0.130	0.082	0.060	0.108

[†] Includes only SCR-equipped units listed in Table III-1 and Tables III-3 through III-5. Each weighted average emission rate is computed as the sum of ozone season NO_x emissions for the group of units divided by the sum of ozone season heat input for the group of units. Data are from EPA Clean Air Markets, Power Sector Emissions Data, Air Markets Program Data (AMPD).

EPA has also examined the historical emissions data for individual coal-fired units in the four states. In recent years, many coal-fired units have experienced reduced overall utilization and more frequent cycling between lower and higher levels of output. In theory, more frequent cycling can cause a unit’s average emission rate to increase because SCR controls may be less effective at lower load levels with correspondingly lower operating temperatures. To account for the possible impacts of changing operating patterns on NO_x emission rates, for this unit-specific analysis EPA has grouped the hourly emission rate data for each unit according to the unit’s heat input for the hour (using hourly heat input as a proxy for both hourly operating level and hourly operating temperature).¹⁵ The unit-specific analyses for all the units are compiled into a technical support document entitled “Analysis of Ozone Season NO_x Emissions Data for Coal-fired EGUs in Four Mid-Atlantic States” (referred to here as the “Emissions Data TSD”) available in the docket for this action.

For each unit, the Emissions Data TSD includes charts with data for the ozone seasons in the 2009-2019 period during which the unit achieved its lowest and third-lowest average NO_x emission rates.¹⁶ In addition, data are also shown for the 2019 ozone season if that was not the year of the lowest or third-

¹⁵ EPA grouped the hourly data for each unit into ten evenly spaced “bins” based on the relationship of the unit’s heat input in that hour to the unit’s maximum hourly heat input capacity. Thus, bin 1 includes hours when the unit combusted between 0% and 10% of its maximum hourly heat input capacity and bin 10 includes hours when the unit combusted between 90% and 100% of its maximum hourly heat input capacity.

¹⁶ Data for the ozone season with each unit’s third-lowest emission rate during the 2009-2019 period are included for comparability with the data sets EPA has used to identify emission reduction opportunities in the CSAPR Update and the proposed Revised CSAPR Update. Data for the ozone season with each unit’s lowest emission rate during the same period are also included for greater comparability with the data provided by the OTC to support its CAA section 184(c) recommendation. EPA notes that for some units the OTC has provided data for ozone seasons before 2009.

lowest average NO_x emission rate. To indicate how operating patterns may have changed over time, an initial chart for each unit shows, for the set of selected ozone seasons, the number of hours during each of the ozone seasons in which the unit operated at each of the operating levels described above.

Additional individual charts for each of the selected ozone seasons then display the unit's emission rate data and mass emissions data at each of the operating levels. The mass emissions data are displayed as bar charts, with each bar indicating the total NO_x emitted during the selected ozone season in hours when the unit operated at that operating level. The hourly emission rate data values for each operating level are displayed by means of a "box plot" or "box-and-whisker plot." Each "box" represents the middle half of all the hourly data values – that is, the hourly data values that fall in the "interquartile range" between the 25th percentile and 75th percentile hourly data values. The horizontal line in the box represents the median hourly data value. Vertical lines, or "whiskers," extend to the highest and lowest hourly data values that fall above or below the top or bottom edges of the box within a distance of up to 1.5 times the interquartile range. Any outlying hourly data values that fall above or below the top or bottom edges of the box by a distance of more than 1.5 times the interquartile range are shown as individual dots. Thus, a lower median data value and lower overall placement of the box on the chart indicate generally lower hourly emission rates, while shorter vertical distances between the top and bottom edges of the box and between the top and bottom ends of the whiskers, as well as fewer outliers, indicate lower variability (or greater consistency) of a unit's hourly emission rates at a given operating level. In this way, each box plot provides visual representations of both the magnitude and variability of a unit's hourly NO_x emission rates at a given operating level in a single chart. For comparison purposes, each box plot also includes a horizontal dashed line showing the 0.12 lb/mmBtu emission rate limit that Pennsylvania's SCR-equipped units are required to meet – under certain operating conditions, on a 30-day rolling average basis – by the state's current RACT rules.¹⁷

As examples of the more comprehensive analysis included in the Emissions Data TSD, the figures below show results for three SCR-equipped units: Keystone unit 1 and Conemaugh unit 2, the two Pennsylvania

¹⁷ Pennsylvania's current RACT rules are summarized in section V.B. of this document.

units with the highest overall NO_x mass emissions in the 2019 ozone season, and Brandon Shores unit 2, a Maryland unit that produced the largest amount of NO_x emissions during the 2019 ozone season of any coal-fired EGU in Delaware, Maryland, or New Jersey.¹⁸

Figures IV-1 and IV-2 show data for Brandon Shores unit 2 for 2017 (third-lowest average rate for 2009-2019) and 2019 (lowest average rate). Although the chart of operating hours indicates that in 2019 the unit spent more hours at operating levels 4-5 and fewer hours at operating levels 6-9 than in 2017, the distributions of the hourly emission rate data for 2017 and 2019 are still quite similar. In both years, hourly emission rate data for operating levels 4-10 are quite consistent, with half of the hourly data captured in thin boxes at emission rates below 0.10 lb/mmBtu. The hourly emission rate data for operating levels 1-3, generally representing start-up or shut-down conditions as indicated by the small numbers of operating hours, are less consistent and higher (at operating levels 2-3), indicating that the unit's SCR controls may not have operated until the unit reached operating level 4. The main difference between the emission rate data in the 2017 and 2019 box plots is a decrease in the number of outlier hours at operating level 6. Relative to 2017, mass emissions in 2019 increased slightly at operating levels 4-5 and decreased by larger amounts at operating levels 6-9, with both the increases and decreases driven primarily by changes in the numbers of hours spent at the respective operating levels.

¹⁸ The Keystone, Conemaugh, and Brandon Shores plants each have two coal-fired EGUs, and in each case EPA's data analysis for the plant's other unit resulted in charts similar to the charts for the plant's unit shown here. The charts for all the units are included in the Emissions Data TSD available in the docket.

Figure IV-1: Distribution of Ozone Season Operating Hours for Brandon Shores unit 2

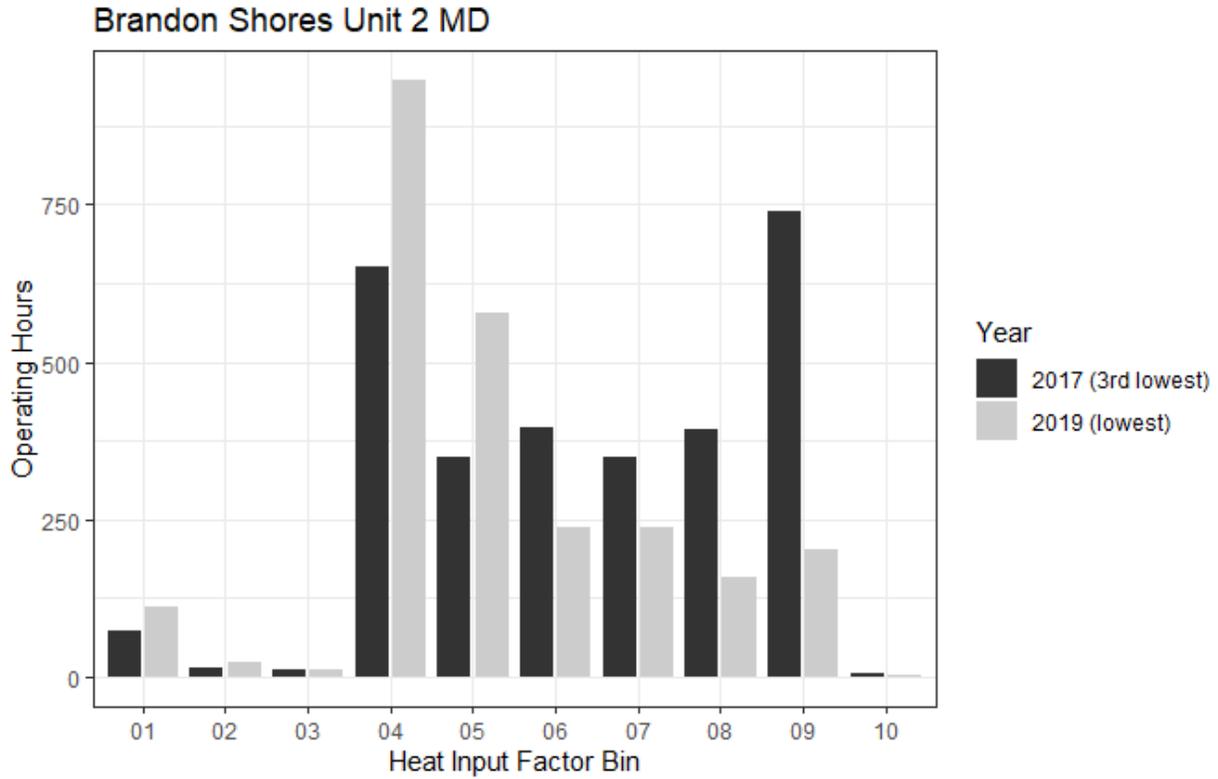
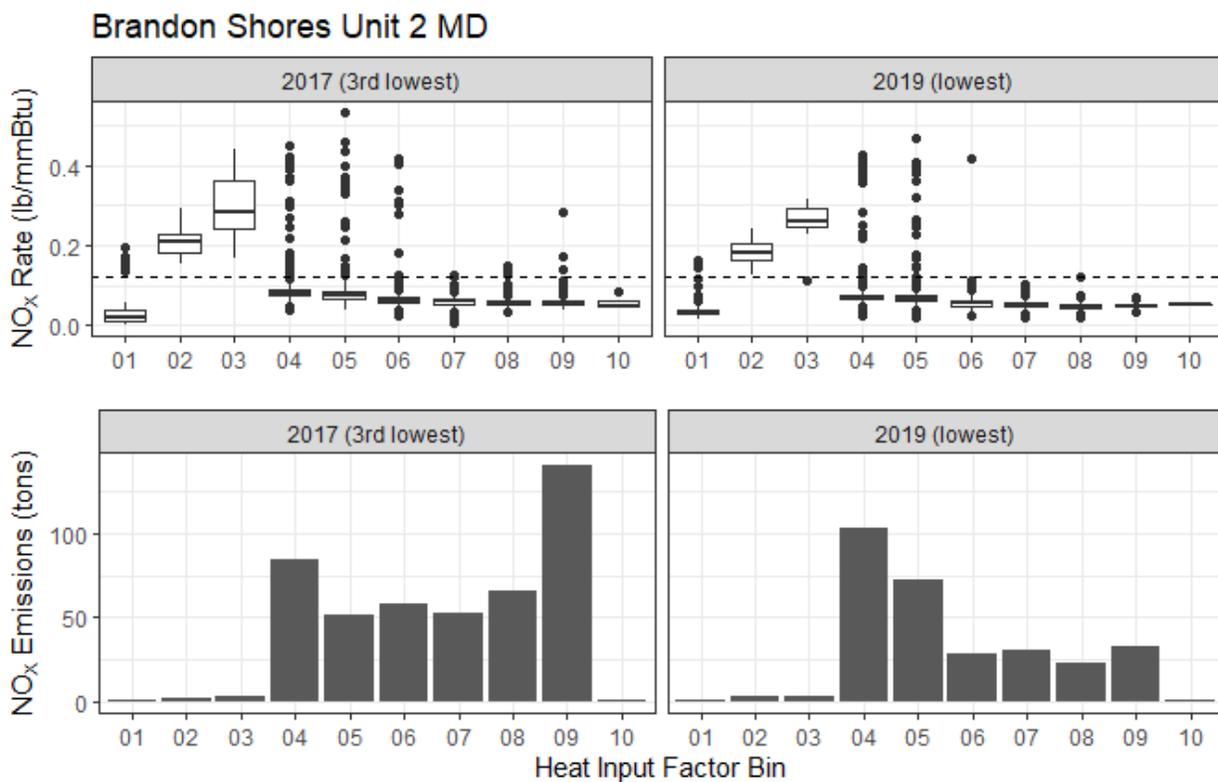


Figure IV-2: Distribution of Hourly Ozone Season NO_x Emission Rates and NO_x Mass Emissions for Brandon Shores unit 2



Figures IV-3 and IV-4 show data for Keystone unit 1 for 2010 (lowest average rate for 2009-2019), 2017 (third-lowest average rate), and 2019. The data for 2010 show that almost all hours were spent at operating levels 6-8, and that hourly emission rates at load levels 6-9 were very consistent, with half of the hourly data captured in thin boxes at emission rates below 0.10 lb/mmBtu. In 2017, there was a shift of hours from operating level 8 to operating level 7, emission rates continued to show consistency with thin boxes at operating levels 7-9 but showed much greater variability at operating level 6, and the level of the boxes was higher than in 2010. In 2019, hours were spread more broadly, down to operating level 4 and a few hours at operating level 10, and emission rates showed less consistency at operating level 7 than in either 2010 or 2017.¹⁹ Relative to 2010 and 2017, the changes to mass emissions in 2019 include, first, an increase in emissions at operating level 8 that appears to be driven primarily by generally higher hourly emission rates at this operating level, and second, an increase in emissions at operating level 5 that appears to be driven primarily by an increase in hours spent at this operating level.

¹⁹ EPA notes that additional analysis showed that the outlier values in the Keystone unit 1 hourly emission rate data at operating level 8 were spread across the ozone season and were not concentrated in a manner that would suggest controls were being intentionally idled on particular days. See Emissions Data TSD at Section 3.2.

Figure IV-3: Distribution of Ozone Season Operating Hours for Keystone unit 1

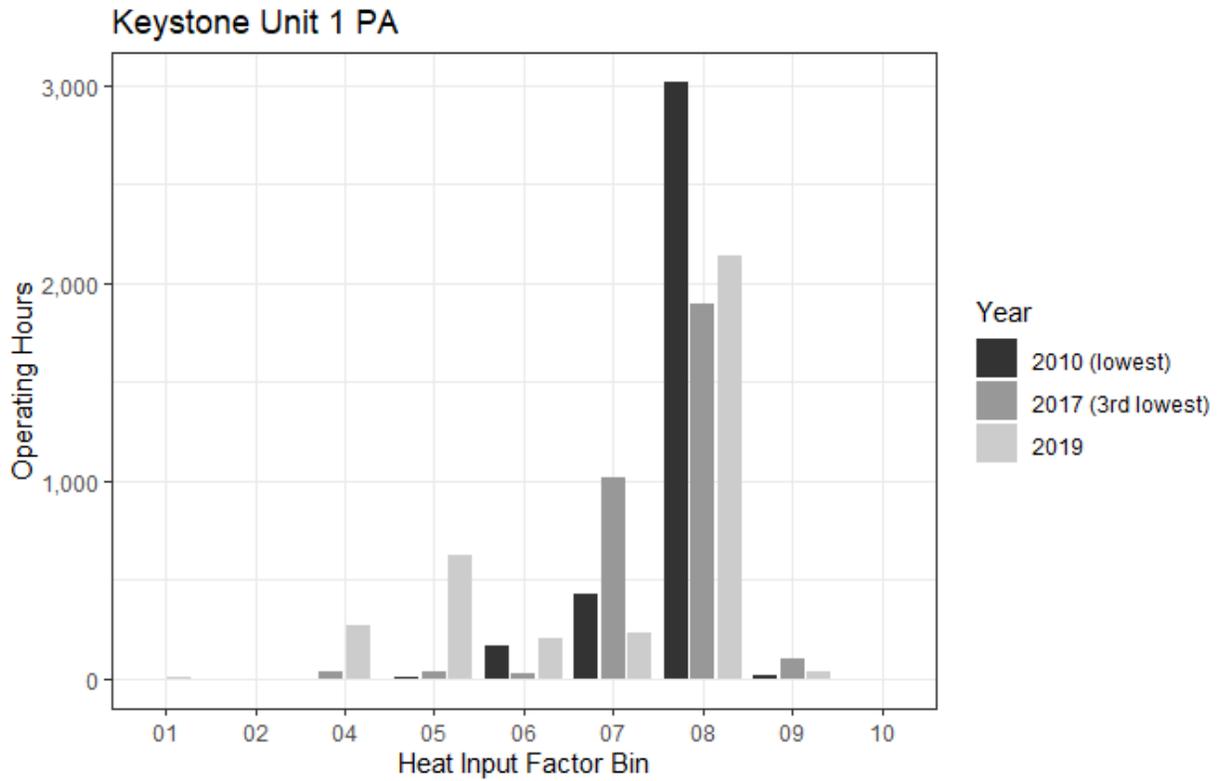
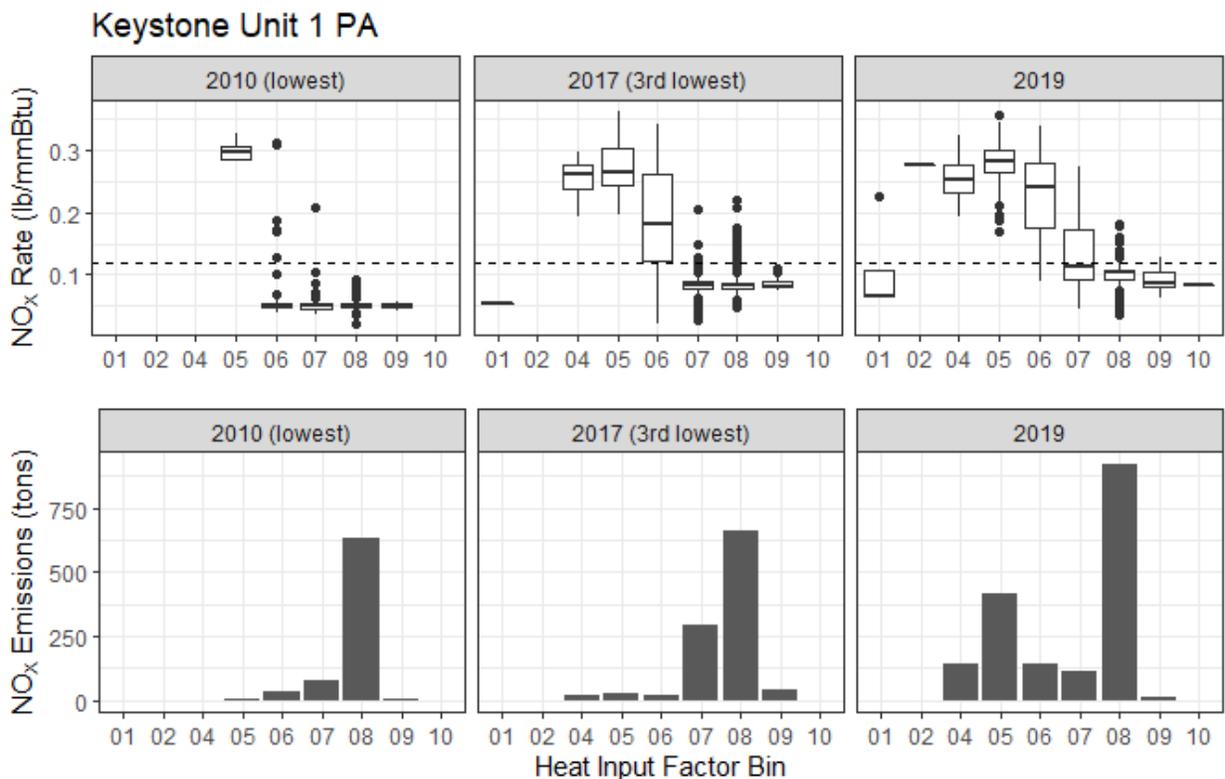


Figure IV-4: Distribution of Hourly Ozone Season NO_x Emission Rates and NO_x Mass Emissions for Keystone unit 1



Figures IV-5 and IV-6 show data for Conemaugh unit 2 for 2016 (third-lowest average rate for 2009-2019), 2018 (lowest average rate), and 2019. The data for 2016 show that hours were spread across operating levels 4-9, and only operating levels 8-9 showed somewhat thin boxes indicating relatively consistent hourly emission rates. In 2018, hours were spread across operating levels 5-9, with a heavy concentration at operating level 9, and the unit's emission rate data showed consistently thin boxes across all of those load levels at emission rates below 0.10 lb/mmBtu, although with outliers at most operating levels. In 2019, hours were again spread across operating levels 5-9, with an increase at operating level 5, and consistent emission rates with a thin box were achieved only at operating level 9, with a relatively high frequency of outlier values.²⁰ Relative to 2016 and 2018, the changes to mass emissions in 2019 include, first, increases in emissions at operating level 6-8 that appear to be driven primarily by generally higher hourly emission rates at these operating levels, and second, a large increase in emissions at operating level 5 that appears to be driven primarily by generally higher hourly emission rates at this operating level but also to some extent by an increase in hours spent at this operating level.

²⁰ EPA notes that additional analysis showed that the outlier values in the Conemaugh unit 2 hourly emission rate data at operating level 9 were spread across the ozone season and were not concentrated in a manner that would suggest controls were being intentionally idled on particular days. See Emissions Data TSD at Section 3.2.

Figure IV-5: Distribution of Ozone Season Operating Hours for Conemaugh unit 2

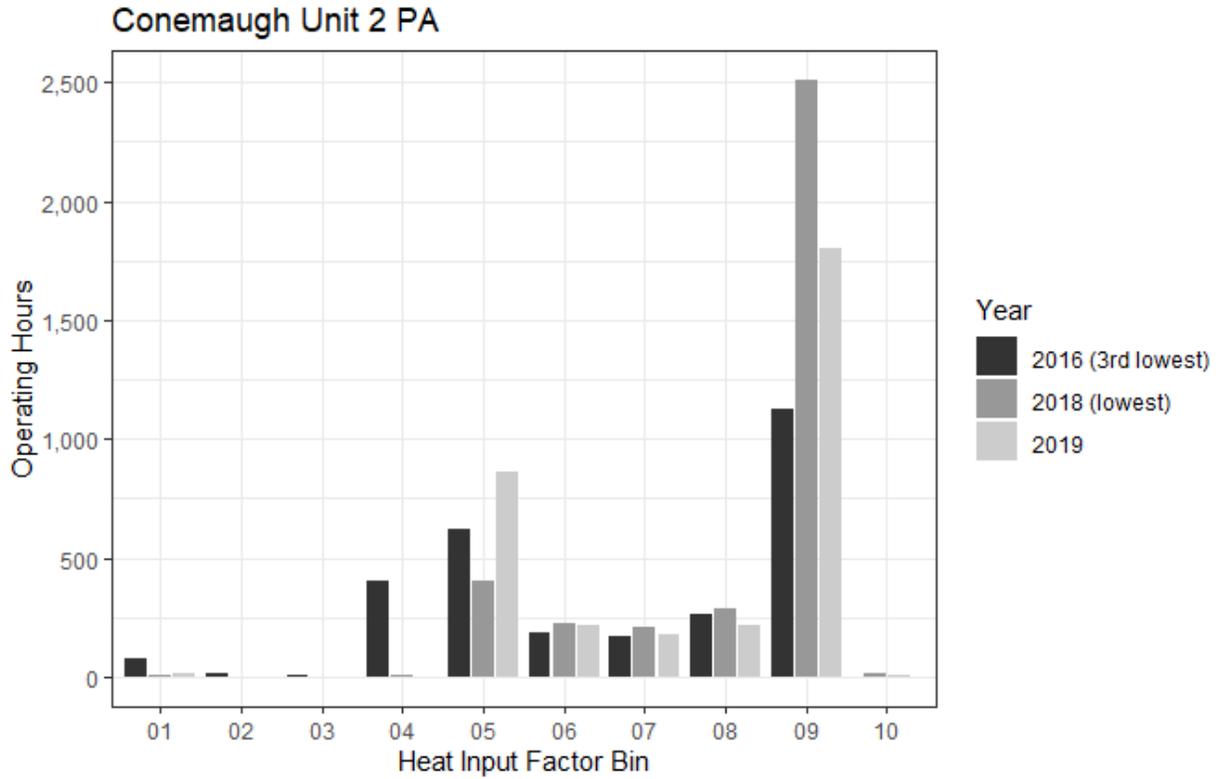
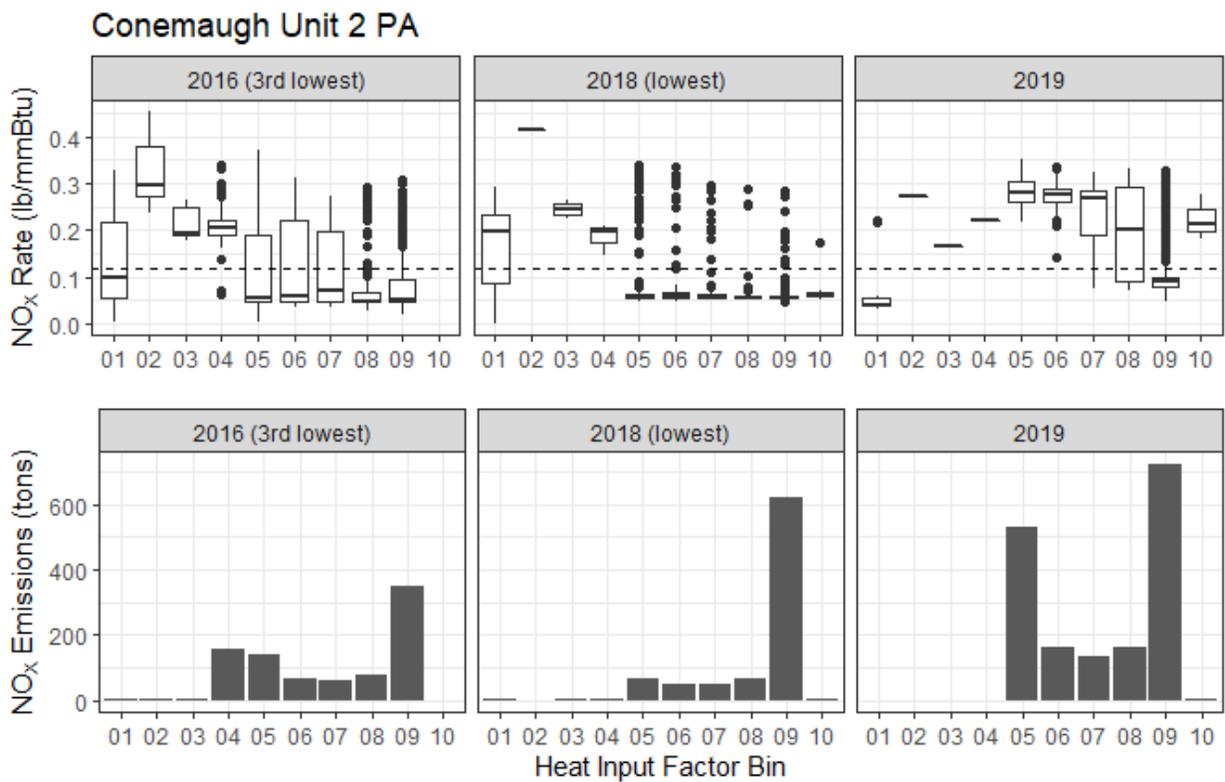


Figure IV-6: Distribution of Hourly Ozone Season NO_x Emission Rates and NO_x Mass Emissions for Conemaugh unit 2



EPA requests comment on the analysis of emissions and operating data contained in the Emissions Data TSD and summarized in this section, including but not limited to the following questions:

- To what extent do the data support a conclusion that that coal-fired EGUs in Pennsylvania equipped with SCR or SNCR controls could further optimize operation of those controls to reduce NO_x emissions during the ozone season, notwithstanding changes in the units' operating patterns in recent years?
- To what extent do the data support a conclusion that any particular type of control measure—i.e., a requirement to operate and optimize controls, a daily NO_x emission rate limit, or some combination of the two—would be more or less effective at reducing ozone season NO_x emissions from the Pennsylvania units?

V. Current Regulatory Context

The OTC's CAA section 184(c) recommendation is made in the context of ongoing activities addressing other CAA provisions. At least two such activities appear to have the potential to cause reductions in emissions from the Pennsylvania EGUs potentially affected by the OTC's recommendation by the point in time at which emissions reductions could be anticipated in response to an approval or partial approval of the OTC's recommendation, and the resulting SIP call and implementation. The first is EPA's Revised CSAPR Update rulemaking to address the interstate pollution transport obligations of states including Pennsylvania with respect to the 2008 ozone NAAQS, 85 FR 68964 (October 30, 2020). The second is Pennsylvania's proceedings to revise NO_x RACT requirements applicable to the state's coal-fired EGUs. In this section, EPA discusses these activities and requests comment on the relevance of these or other activities to EPA's decision on whether to approve, disapprove, or partially approve and partially disapprove the OTC's recommendation.

A. Revised CSAPR Update

Starting more than two decades ago, EPA has issued multiple rules requiring reductions in NO_x emissions to address the interstate transport of NO_x as an ozone precursor, including the NO_x SIP Call, 63 FR 57356 (October 27, 1998); the Clean Air Interstate Rule (CAIR), 70 FR 25162 (May 12, 2005); the Cross-State Air Pollution Rule (CSAPR), 76 FR 48208 (August 8, 2011); and the CSAPR Update, 81 FR 74504 (October 26, 2016).²¹ These actions were all taken under the authority of CAA section 110(a)(2)(D)(i)(I), often referred to as the “good neighbor provision.” The rules were implemented through enforceable emission limits (emission budgets) that were designed to incentivize emission reductions while providing sources with flexibility as to the specific control strategies employed. Depending on the rule, the budgets were set at stringencies reflecting control measures that include new combustion or post-combustion controls, operation of existing post-combustion controls, and shifting of generation to lower emitting units.

The CSAPR Update addressed ozone transport under the 2008 ozone NAAQS by establishing more stringent statewide budgets for ozone season NO_x emissions from EGUs in 22 states starting in 2017. The covered states include Pennsylvania, Maryland, and New Jersey. In *Wisconsin v. EPA*, 938 F.3d 303 (D.C. Cir 2019), the D.C. Circuit court upheld the CSAPR Update in most respects but remanded the rule to EPA for failing to fully address good neighbor obligations of the affected states with respect to the 2008 ozone NAAQS by the applicable attainment dates.²² On October 30, 2020, EPA published a proposal for a Revised CSAPR Update in response to the court’s remand that, based on new analysis, would establish reduced NO_x ozone season emission budgets for 12 states including Pennsylvania. 85 FR 68964. Under EPA’s proposal, if finalized, this rule would fully resolve the outstanding good neighbor obligations for Pennsylvania and the other eleven states for the 2008 ozone NAAQS. The rule does not, however, address the 2015 ozone NAAQS. As under the CSAPR Update, the proposed budgets are based

²¹ EPA’s CSAPR Close-Out, 83 FR 65878 (Dec. 21, 2018), determined that no further NO_x reductions were required in upwind states to address downwind nonattainment and maintenance problems for the 2008 ozone NAAQS based on EPA’s assessment of the analytical year 2023.

²² The D.C. Circuit vacated the CSAPR Close-Out determination in *New York v. EPA*, 781 Fed. App’x 4 (D.C. Cir. 2019), for the same flaw it found in the CSAPR Update in *Wisconsin*.

on emission reductions achievable through full operation of existing SCR controls, upgrade of combustion controls where possible, and limited generation shifting.

To develop the proposed emission budgets for the Revised CSAPR Update, EPA identified SCR-equipped units in the relevant upwind states whose 2019 emission rate data suggested they were not optimizing their SCR controls to achieve an average emission rate of 0.08 lb/mmBtu or less during the ozone season.²³ EPA then projected the emission reductions that would be achieved if each of these units reduced its average emission rate to 0.08 lb/mmBtu, while units already achieving lower emission rates continued to do so. This methodology resulted in projected emission reductions from Pennsylvania units (implemented through an ozone season cap) of over 3,100 tons through SCR optimization alone. The proposed 2021 budget for Pennsylvania is 33% lower than the state's 2019 ozone season emission levels. EPA has a court-ordered deadline to take final action on the Revised CSAPR Update by March 15, 2021.²⁴

In focusing on emission reductions achievable through optimization of existing SCR controls, the Revised CSAPR Update bases its emission budgets for Pennsylvania to a considerable extent on the same units from which emission reductions are sought under the OTC's section 184(c) recommendation. The two regulatory initiatives would employ different compliance mechanisms, with the OTC's recommendation centered on unit-specific daily limits while the Revised CSAPR Update would employ a flexible trading program implemented through regionwide emission caps, and state emission budgets and assurance levels. The Revised CSAPR Update's budgets would reflect a much more stringent target emission rate of 0.08 lb/mmBtu (on an ozone season average basis) than the 0.125 lb/mmBtu and 1.5 lb/MWh rates (on a daily basis) in the Delaware and New Jersey rules.²⁵ EPA also notes that under the procedural

²³ For both the CSAPR Update and the proposed Revised CSAPR Update, EPA based its assessment of the emission reductions achievable through operation and optimization of SCR controls on the average of the third-lowest ozone season average emission rates achieved by SCR-equipped units nationwide. For the CSAPR Update, EPA considered data for the period from 2009 through 2015 and the resulting average emission rate was 0.10 lb/mmBtu. For the proposed revised CSAPR Update, EPA considered data for the period from 2009 through 2019 and the resulting average emission rate was 0.08 lb/mmBtu. See 85 FR at 68990-91.

²⁴ See *New Jersey v. EPA*, No. 1:20-cv-01425 (S.D.N.Y. July 28, 2020).

²⁵ As previously noted, for a typical range of heat rates for coal-fired units of 9,000 to 11,000 Btu/kWh, an emission rate limit of 1.5 lb/MWh would be equivalent to emission rate limits in a range of 0.136 to 0.167 lb/mmBtu.

requirements of section 184(c), it is likely that any emission reductions resulting from approval of the OTC's recommendation could not be anticipated until the 2022 ozone season, given that EPA's deadline for acting on the recommendation falls in March 2021 and would be followed by a SIP call process. In contrast, EPA has proposed to implement the Revised CSAPR Update starting in the 2021 ozone season.

In light of the substantial overlap in the Pennsylvania sources that would be affected by the Revised CSAPR Update and by the OTC's section 184(c) recommendation, and recognizing the differences in the proposed structure, stringency, and implementation timing of the two initiatives, EPA requests comment on whether and how the potential finalization and implementation of the Revised CSAPR Update bears on the question of whether the additional control measures sought in the OTC's section 184(c) recommendation are necessary to achieve attainment of the 2008 or 2015 ozone NAAQS in the OTR.

B. Pending Revisions to Pennsylvania NO_x RACT Requirements

Under CAA sections 184(b) and 182(f)(1), all states in the OTR must implement NO_x RACT on a statewide basis for sources meeting certain criteria, generally including coal-fired EGUs. In addition, each OTR state generally must update its RACT determinations for each revised ozone NAAQS. *See* 40 CFR 51.1116 and 51.1316. Pennsylvania most recently updated its NO_x RACT requirements for coal-fired EGUs in 2016 to address the 2008 ozone NAAQS (Pennsylvania calls these requirements "RACT II"). The requirements, which first became effective in January 2017, are codified at 25 Pa. Code §§ 129.96 – 129.100: Additional RACT Requirements for Major Sources of NO_x and VOC. Section 129.97 sets "presumptive" RACT requirements for certain categories of sources, including coal-fired combustion units with SCR controls (129.97(g)(1)(viii)) and coal-fired combustion units with SNCR controls (129.97(g)(1)(ix)). Section 129.97(g)(1)(viii) requires that existing SCR-equipped coal-fired EGUs not exceed a NO_x emission rate limit of 0.12 lb/mmBtu when operating with an SCR inlet temperature greater than or equal to 600 degrees Fahrenheit. Section 129.97(g)(1)(ix) requires that coal-fired combustion units with SNCR controls must operate their SNCR controls when operating with a temperature in the reagent injection area greater than or equal to 1,600 degrees Fahrenheit but does

not set a NO_x limit. Section 129.97(g)(1)(vi) establishes additional NO_x emission rate limits that apply to coal-fired combustion units with rated heat input capacities greater than 250 million Btu per hour but operating at lower temperatures without regard to their installed control equipment: 0.16 lb/mmBtu for fluidized bed units, 0.35 lb/mmBtu for tangentially fired units, and 0.40 lb/mmBtu for all other types of units. Under section 129.100(a)(1), compliance with all of these limits must be demonstrated on a 30-day rolling average basis. Section 129.98 allows the emission rate limits to be met through averaging with other units subject to Pennsylvania's RACT requirements (including non-coal-fired units) under the control of the same owner or operator. EPA conditionally approved Pennsylvania's rules as satisfying NO_x RACT requirements in a revision to Pennsylvania's SIP, but the limits in section 129.97(g)(1)(viii) and (ix) were fully approved. 84 FR 20274 (May 8, 2019). However, the U.S. Court of Appeals for the Third Circuit subsequently vacated and remanded the portion of EPA's approval concerning the 0.12 lb/mmBtu limit for coal-fired EGUs with SCR controls, and the 600 degree temperature exemption for that limit, both of which are found in section 129.97(g)(1)(viii). The court held that the approval of this specific provision was not supported by adequate facts or reasoning in the record. *Sierra Club v. EPA*, 972 F.3d 290, 299-307 (3d Cir. 2020).²⁶ EPA has not yet proposed any action in response to the remand, nor has Pennsylvania proposed or adopted updates to its RACT II rules.

In 2019, Pennsylvania started the process of updating its RACT requirements for the 2015 ozone NAAQS (referred to as "RACT III") by discussing potential concepts for a rule at its Air Quality Technical Advisory Committee meetings. For EGUs, the draft rule would require SCR-equipped and SNCR-equipped units to optimize the use of their controls consistent with technological limitations, manufacturer specifications, good engineering and maintenance practices, and good air pollution control practices. The rule would continue to differentiate the applicable emission rate limits based on specified temperature thresholds and generally would not change the levels of the emission rate limits for SCR-equipped coal-fired EGUs established in the RACT II rule, but would require compliance to be demonstrated on a daily average

²⁶ The Court also found that the recordkeeping and reporting requirement in section 129.100(d)(1) was inadequate to ensure that the 0.12 lb/mmBtu limit was being met because it did not specifically require that the inlet temperature to the SCR be recorded and reported. *Sierra Club v. EPA*, 972 F.3d 290, 307-309 (3d Cir. 2020).

basis instead of a 30-day rolling average basis. In addition, a new emission rate limit of 0.10 lb/mmBtu on a 30-day rolling average basis would be established for SCR-equipped coal-fired units when operating with an SCR inlet temperature greater than or equal to 600 degrees Fahrenheit. Compliance generally could still be demonstrated by averaging across units under the control of the same owner or operator. The new rules would generally be implemented by January 1, 2023.²⁷ The OTC recognizes Pennsylvania's efforts to update its RACT requirements and has indicated its intention to withdraw the CAA section 184(c) recommendation if Pennsylvania adopts a rule addressing the recommendation. EPA notes that the draft RACT III rule described above was prepared before the court remand of EPA's approval of the state's RACT II rule.

EPA requests comment on whether and how Pennsylvania's RACT III rulemaking, as well as the remand of EPA's approval of Pennsylvania's RACT II SIP submittal, may bear on EPA's decision to approve, disapprove, or partially approve and partially disapprove the OTC's section 184(c) recommendation, including but not limited to the following questions:

- If EPA approved the OTC's section 184(c) recommendation and, in response to the resulting SIP call, Pennsylvania submitted a rule along the lines of the draft RACT III rule discussed above, could EPA approve the draft rule as meeting the OTC's recommendation? That is, could EPA determine that the draft rule is as stringent as the Delaware, Maryland, or New Jersey rules included in the OTC's recommendation? If the rule would not be approvable, how would Pennsylvania need to modify the draft rule to make it meet the OTC's recommendation?
- Is it appropriate for EPA to evaluate the necessity of additional measures for bringing areas in the OTR into attainment prior to the establishment of OTR RACT for VOC and NO_x under CAA section 184(b) (and, for NO_x, the extension provision of CAA section 182(f)(1))? Given that section 184(c)

²⁷ See Pennsylvania Department of Environmental Protection, "Draft Proposed RACT III Rulemaking" (Feb. 13, 2020) at 15-21, available in the docket for this action and at <http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Advisory%20Committees/Air%20Quality%20Technical%20Advisory%20Committee/2020/2-13-20/RACT%20III%20Requirements%20AQ-TAC%20Presentation%202-13-2020.pdf>.

and section 184(b) establish independent requirements, is it appropriate for EPA to conclude that a specific set of recommended additional measures may be necessary under section 184(c) and mandate their implementation without having first given Pennsylvania an opportunity to adopt a potentially different set of measures as RACT for purposes of the 2015 ozone NAAQS that could render some or all of the recommended additional measures unnecessary as related to that NAAQS?

C. Other Pending Regulatory Activities

In addition to the proposed Revised CSAPR Update and Pennsylvania's efforts to update RACT requirements, it is possible that activities being undertaken to meet other CAA requirements could result in requirements for coal-fired EGUs in Pennsylvania to reduce NO_x emissions. For example, promulgation of the 2015 ozone NAAQS triggered a requirement, which has not yet been met, for Pennsylvania to revise its SIP to address the state's obligations under the good neighbor provision for this NAAQS.²⁸ Also, on March 12, 2018, New York submitted a petition to EPA under CAA section 126(b) seeking a finding that approximately 350 sources in nine states, including all of the Pennsylvania EGU facilities potentially affected under the OTC's section 184(c) recommendation, emit or would emit NO_x in violation of the good neighbor provision with respect to the 2008 and 2015 ozone NAAQS. Although EPA denied that petition, 84 FR 56058 (Oct. 18, 2019), the D.C. Circuit subsequently vacated the denial and remanded for EPA to promulgate a revised response, *New York v. EPA*, 964 F.3d 1214, 1226 (D.C. Cir. 2020).

EPA requests comment on whether and how regulatory activities besides the proposed Revised CSAPR Update and Pennsylvania's efforts to update RACT requirements, including but not limited to activities addressing the requirements noted above, may bear on EPA's decision to approve, disapprove, or partially approve and partially disapprove the OTC's section 184(c) recommendation.

²⁸ On December 5, 2019, EPA published findings that Pennsylvania and several other states had failed to submit SIP revisions to address their good neighbor obligations with respect to the 2015 ozone NAAQS. 84 FR 66612.

Dated: December 15, 2020.

Anne L. Austin,

Principal Deputy Assistant Administrator.

Appendix: OTC Recommendation

OTC Recommendation for Establishing Daily Limits for Coal-Fired EGUs in Pennsylvania to Ensure that Existing Control Technologies are Optimized to Minimize Nitrogen Oxide Emissions Each Day of the Summer Ozone Season

The Ozone Transport Commission (OTC) recommends that the U.S. EPA require Pennsylvania to revise the Pennsylvania State Implementation Plan to include additional control measures which would establish daily nitrogen oxides (NO_x) emission limits for all coal-fired EGUs with already installed Selective Catalytic Reduction (SCR) or Selective Non Catalytic Reduction (SNCR) control technology to ensure that these technologies are optimized to minimize NO_x emissions each day of the ozone season.

These requirements must be as stringent as any one of the rules attached. These rules all establish daily limits designed to optimize the use of SCR and SNCR control technologies to minimize NO_x emissions each day of the ozone season. Daily NO_x limits for coal-fired EGUs have been adopted by Delaware, New Jersey and Maryland, three of the states adjacent to and directly downwind of Pennsylvania.

Pennsylvania contributes significantly to four downwind nonattainment areas in the OTC including Washington D.C., Baltimore, Philadelphia, and New York City. During the summer of 2018, NO_x emissions from coal-fired EGUs in Pennsylvania equipped with SCR and SNCR were more than four times greater than the NO_x emissions from coal-fired EGUs in Delaware, New Jersey and Maryland combined.

Pennsylvania has not yet adopted daily NO_x limits for coal-fired EGUs. Therefore, the OTC is recommending that EPA require Pennsylvania to adopt and implement daily NO_x limits as expeditiously as practicable. It is our hope that the three options embodied in the Delaware, New Jersey and Maryland regulations will provide Pennsylvania with the flexibility to implement daily NO_x limits in a

time frame to help downwind OTC states attain the 2015 ozone standard by the dates required in the Clean Air Act.

Because this recommendation does not involve the purchase or installation of new control technologies, the OTC urges EPA to require that Pennsylvania implement these requirements in time to reduce ozone levels during the summers of 2020 and 2021. All of the marginal nonattainment areas in the Ozone Transport Region (OTR) are on a path to not attain the 2015 ozone standard by 2021, the mandated attainment date for marginal nonattainment areas, if additional NO_x reductions are not achieved.

Attachments [not shown]:

1. Delaware Administrative Code, Title 7 Natural Resources & Environmental Control, 1100 Air Quality Management Section, 1146 "Electric Generating Unit (EGU) Multi-Pollutant Regulation" (pages 1-9).
2. New Jersey State Department of Environmental Protection, New Jersey Administrative Code, Title 7, Chapter 27, Subchapter 19, "Control and Prohibition of Air Pollution from Oxides of Nitrogen" (pages 1 & 27-29).
3. Maryland - Code of Maryland Regulations (COMAR), Title 26 Department of the Environment, Subtitle 11 Air Quality, Chapter 38, "Control of NO_x Emissions from Coal-Fired Electric Generating Units" (pages 1-6).

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