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VIA ELECTRONIC MAIL

Mr. Eddie DuRant
Air Regulations Development Division
Maryland Department of the Environment
1800 Washington Boulevard, STE 730
Baltimore, MD 21230-1720
Email: eddie.durant@maryland.gov

RE: Comments of the Sierra Club and Chesapeake Climate Action Network Regarding Draft NOx RACT; COMAR 26.11.38

Dear Mr. DuRant:

On behalf of the Sierra Club and Chesapeake Climate Action Network (Environmental Commenters), I am submitting the following initial comments regarding the Maryland Department of the Environment's (MDE's) December 11, 2013 draft Reasonably Available Control Technology (RACT) regulation for oxides of nitrogen (NOx), to be codified at COMAR 26.11.38.[1]

As MDE has emphasized throughout the stakeholder process in developing this regulation, Maryland has some of the worst air quality in the country and the highest ozone levels in the East. In order to protect the health of Marylanders from the serious public health threat posed by ground-level ozone, Maryland must employ an all-of-the-above strategy targeting reductions of both in-state and out-of-state emissions of ozone precursors. Consistent with this approach, Maryland has recently taken an important step to address transport of ozone and ozone precursors from upwind states by joining with neighboring states to petition to expand the Ozone Transport Region to include nine additional upwind states. Maryland must now follow through on this initial step by ensuring that in-state sources comply with at least the same level of control that Maryland has sought from its upwind counterparts, especially in light of the fact that Maryland NOx sources contribute significantly to nonattainment for both ozone and fine particulate matter (PM2.5) in downwind states.

The proposed regulation takes a common-sense approach to establishing RACT limits for Maryland's large coal units. For units that have already installed state-of-the-art emission

[1] Environmental Commenters reserve the right to file additional comments when the formal Notice of Proposed Action is filed or during the stakeholder process in the event that any modification is made to the current draft.

controls, the regulation seeks to require these units to operate the controls commensurate with achievable and historically demonstrated control efficiencies. As documented in the accompanying technical report of Dr. Ranajit Sahu, historical performance indicates that these emission rates could and should be set even lower, and revised 24-hour limits are recommended. For units that lack state-of-the-art emission controls, the regulations give these units two years to modernize their controls. This is an appropriate approach given the seriousness of the ozone problem in Maryland. As EPA has explained, the cost-effectiveness threshold for RACT controls is a function of the severity of the nonattainment. Where, as here in Maryland, the nonattainment problem is severe, a robust approach to cost-effectiveness is required. This is particularly true given that the most serious health impacts from ozone are associated with high energy demand days when the non-SCR units are almost certain to be operating. It is imperative that these units be capable of curtailing their NOx emissions on these days, and therefore that they comply with emission limits consistent with the installation and operation of state-of-the-art emission controls.

I. FACTUAL BACKGROUND

Tropospheric or ground-level ozone is an air pollutant that causes serious adverse human health effects. Ground-level ozone is formed when NO_x and volatile organic compounds (VOCs) interact in the presence of sunlight. Ozone's effects on the human respiratory system include inducing asthma attacks in asthmatics and aggravating chronic lung diseases like emphysema and bronchitis.[2] Long-term exposure to ozone may result in the permanent scarring of lung tissue.[3] Exposure to ozone can also lead to "chronic, adverse effects on lung development in children from the age of 10 to 18 years . . . ."[4] However, the greatest harm "may occur later in life, since reduced lung function is a strong risk factor for complications and death during adulthood."[5]

To address the serious health threats from ozone, in 1997 EPA established the first national ambient air quality standard for ground-level ozone. Based on subsequent clinical studies showing respiratory effects at levels below the 1997 standard,[6] EPA revised the NAAQS downward in 2008 "to provide increased protection for children and other 'at risk' populations against an array of [ozone]-related adverse health effects . . . ."[7] EPA estimates that the 2008 8-hour ozone NAAQS has the potential to avoid 260-2,000 premature deaths annually as of 2020.[8] The total benefits in ozone reduction from this standard are estimated to save $3 to $17 billion

[2] EPA, Smog—Who Does it Hurt? at 2-3 (July 1999), available at http://www.epa.gov/air/ozonepollution/pdfs/smog.pdf.
[3] EPA, Ground-Level Ozone – Health Effects, available at http://www.epa.gov/glo/health.html.
[4] *See* Gauderman, W. James, *et al.*, *The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age*, New Engl. J. Med. 351:11, at 1057 (Sept. 9, 2004).
[5] *Id*. at 1063.
[6] *Mississippi v. EPA*, Case No. 08-1200, slip op. at 6 (D.C. Cir. July 23, 2013).
[7] National Ambient Air Quality Standard for Ozone; Final rule, 73 Fed. Reg.16,436, 16,436 (Mar. 27, 2008).
[8] EPA, Fact Sheet: Final Revisions to the National Ambient Air Quality Standards for Ozone, 2 (2008), available at http://www.epa.gov/glo/pdfs/2008_03_factsheet.pdf.

per year.[9] In fact, 2011 and 2012 ozone ambient monitoring data indicate that these estimates of the health benefits of reducing ozone exposure by EPA may have been low. [10]

Maryland suffers from some of the worst air quality in the Eastern United States. The Baltimore area was the only area in the East to receive a "moderate" designation by EPA in 2012 for the 2008 ozone NAAQS. And based on Maryland's continued failure to attain the less stringent 1997 ozone NAAQS, the Baltimore area is due to be elevated from "serious" to "severe" nonattainment. Moreover, monitors in the Washington D.C. metro area (which includes a number of Maryland counties) demonstrate that this area is also failing to attain both the 1997 and 2008 ozone NAAQS. The present nonattainment in Maryland is caused by a number of sources including power plants and vehicles in-state as well as large stationary sources such as power plants in upwind states.

On December 9, 2013, in an effort to address transport of ozone and ozone precursors into the region, Maryland, together with eight other northeastern states, submitted a petition to EPA pursuant to Section 176A of the Clean Air Act to expand the Ozone Transport Region (OTR). The petition, signed by the states of Maryland, Connecticut, Delaware, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, and Vermont, would compel the inclusion in the OTR of nine upwind states, all of which contribute significantly to violations of the 2008 ozone NAAQS within the existing OTR. As part of the OTR, upwind states would be required, among other things, to implement RACT for NOx from major stationary sources including coal plants. Maryland itself has taken steps to curtail annual emissions of ozone precursors from its generation sector. However, to date, Maryland has not imposed short-term limits sufficient to address the disproportionate health and air quality impacts associated with NOx emissions on shorter time scales and particularly on high energy demand days.

II. LEGAL BACKGROUND

RACT determinations and RACT-based emission limits are required by the Clean Air Act for areas failing to attain NAAQS. *See* 42 U.S.C. § 7502(c)(1). Because EPA's designations for the 2008 ozone NAAQS became effective on July 20, 2012 and because Baltimore was designated as "moderate" nonattainment pursuant to the 2008 standard, Maryland has until July 20, 2014 to develop and submit to EPA RACT limits for major NOx sources to EPA. RACT is defined as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." *See, e.g.*, 57 Fed. Reg. 55,620, 55,624 (Nov. 25, 1992). Accordingly, RACT determinations must set limits as rigorous as can be met through use of feasible control technology.

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[9] *Id.*

[10] In 2012, much of the country experienced record high temperatures and very high ozone levels. Thus, the benefit analysis done in 2008, which did not consider levels that we would experience in the year before the first compliance year for marginal 2008 ozone NAAQS nonattainment areas, that is 2012, likely underestimated the amount of ozone reductions the 2008 ozone NAAQS will require, and thus the benefit it will provide.

Several states in the region that have already established RACT limits for coal plants have set these limits well below the levels currently being achieved by many of Maryland's coal plants. For example, New York's RACT requirements for boilers greater than 250 MMBtu/hr beginning July 1, 2014 are set forth in Table 1 below:

Table 1: New York RACT Limits for Boilers Greater than 250 MMBtu/hr

Fuel Type	*Tangential*	*Wall*	*Cyclone*	*Fluidized Bed*
Gas Only	0.08	0.08	na	na
Gas/Oil	0.15	0.15	0.20	na
Coal Wet Bottom	0.12	0.12	0.20	na
Coal Dry Bottom	0.12	0.12	na	0.08

Source: 6 N.Y.C.R.R. § 227-2.4(a)(1)(ii).

Delaware has established a uniform standard of 0.125 lb/MMBtu that applies to coal-fired and residual oil-fired electric generating units located in Delaware with a nameplate capacity rating of 25 MW or greater beginning January 1, 2012. 7 Del. Admin. Code § 1146-4.3.

III. SUBSTANTIVE COMMENTS

Coal-fired power plants are among the most significant in-state sources of NOx. Yet approximately half of Maryland's coal units lack selective catalytic reduction (SCR), the most effective control technology for NOx. Moreover, even the units that have installed SCR are not consistently operating the controls, and as a result are emitting NOx at rates many times higher than they are presently capable of achieving. The draft regulation appropriately requires the installation and operation of state-of-the-art emissions controls for the largest contributors of NOx in the State in order to reduce NOx emissions on multiple relevant time scales. Environmental Commenters support the regulations as drafted but recommend that the 24-hour emission rates for the SCR units be lowered to require emission rates that are truly consistent with the best historic performance.

A. For Units with SCR, the Regulation Should Require Performance Consistent with the Best Historical Operation of the Unit

While Environmental Commenters support MDE's stated approach of requiring units that have installed SCR to optimize operation of the controls, as documented in the attached report of Dr. Ranajit Sahu, lower short-term limits are achievable at each of these units. RACT requires MDE to impose "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." 57 Fed. Reg. at 55,624. Since historic performance demonstrates that

these limits are technically achievable and because the costs associated with improved and consistent operation of existing controls would be modest, the proposed rates clearly meet the definition of RACT.

The attached report of Dr. Sahu identifies the periods of historical operation during which Brandon Shores Units 1 and 2, Wagner Unit 3, Chalk Point Unit 1 and Morgantown Units 1 and 2 achieved their lowest 24-hour emission rates. As Dr. Sahu observes, since these units have never been required to comply with short-term emission rates that necessitate the operation of their existing controls, achievable emission rates may be even lower. Nevertheless, based on actual historical operations, the following 24-hour emission limitations have been demonstrated to be achievable:

- Brandon Shores Unit 1: 0.05 lb/MMBtu
- Brandon Shores Unit 2: 0.07 lb/MMBtu
- H.A. Wagner Unit 3: 0.05 lb/MMBtu
- Chalk Point Unit 1: 0.05 lb/MMBtu
- Morgantown Unit 1: 0.04 lb/MMBtu
- Morgantown Unit 2: 0.04 lb/MMBtu

RACT for these units would be 24-hour emission limits consistent with these rates.

B. For Units that Lack SCR, the Regulation Appropriately Requires the Units to Achieve Emissions Rates Consistent with Installation and Operation of this Technology

Environmental Commenters support MDE's proposed phased approach to addressing NOx emissions from the coal units that presently lack SCR. Pursuant to the regulation, units that lack SCR would have approximately two years to achieve emission rates consistent with installation and operation of this technology. Although installation of SCR would entail capital improvements at the non-SCR units, these improvements are technically feasible and meet the RACT definition of cost-effective ness.

EPA has eschewed adopting a specific dollar per ton cost threshold for RACT.[11] Rather, as EPA has explained:

> Areas with more serious air quality problems typically will need to obtain greater levels of emissions reductions from local sources than areas with less serious problems, and it would be expected that their residents could realize greater public health benefits from attaining the standard as expeditiously as practicable. For these reasons, EPA believes that it will be reasonable and appropriate for areas with more serious air quality problems and higher design values to impose emission reduction requirements with generally higher costs per ton of reduced

[11] *See* http://www.epa.gov/air/lead/kittech.html.

> emissions than the cost of emissions reductions in areas with lower design values. In addition, where essential reductions are more difficult to achieve (e.g., because many sources are already controlled), the cost per ton of control may necessarily be higher.[12]

As noted above, Maryland suffers from the worst ozone levels in the East. To achieve compliance with the 2008 8-hour ozone NAAQS, reductions from all major sectors—in-state stationary sources, in-state mobile sources, and out-of-state stationary sources—are essential. Through the passage of the Healthy Air Act, the State took an initial step to address the contribution of stationary in-state NOx sources, and this resulted in some highly effective and some less-highly-effective emission controls being installed on Maryland's coal units. Adhering to EPA's guidance that "where essential reductions are more difficult to achieve (e.g., because many sources are already controlled), the cost per ton of control may necessarily be higher," it is clear that installation of SCR on the remaining coal units—a necessary element of any NAAQS attainment strategy—is both appropriate and cost effective. This is particularly true given that the most serious health impacts from ozone are associated with high energy demand days when the non-SCR units are almost certain to be operating. It is imperative that these units be capable of curtailing their NOx emissions on these days, and therefore that they comply with emission limits consistent with the installation and operation of state-of-the-art emission controls.

In addition, because Maryland's comprehensive ozone NAAQS attainment strategy involves seeking emission reductions from upwind states through its recently filed petition to expand the Ozone Transport Region, it is particularly important that Maryland ensure that its in-state sources are achieving commensurate levels of control. This obligation is especially acute given EPA's finding that Maryland's NOx emissions contribute significant to downwind states' inability to achieve compliance with the 1997 ozone air quality standards as well as the 1997 and 2006 fine particulate air quality standards.[13] Consistent with the emission reductions that Maryland is seeking from major stationary sources in its upwind counterparts, Maryland must ensure that its own in-state sources are required to achieve emission limits consistent with installation of state-of-the-art NOx controls.

Respectfully submitted,

Joshua Berman
Staff Attorney

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[12] *Id.*

[13] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals; Final Rule, 76 Fed. Reg. 48,207, 48,213, Table III-1 (Aug. 8, 2011). For example, EPA found that Maryland contributes 0.15 $\mu g/m^3$ to annual $PM_{2.5}$ nonattainment in Pennsylvania. *Id.* at 48,240-41, Tables 5.D-1 & 5.D-2. And Maryland makes even larger contributions to 24-hour $PM_{2.5}$ NAAQS nonattainment in both Ohio and Pennsylvania. *See id.* at 48,242-43, Tables 5.D-4 & 5.D-5. Maryland also contributes to maintenance of the 1997 ozone NAAQS in Connecticut. *Id.* at 48,245-46, Tables 5.D-7 & 5.D-9.

Sierra Club Environmental Law Program
50 F St. NW, 8th Floor
Washington, DC 20001
Tel: (202) 650-6062
Email: Josh.Berman@sierraclub.org

Diana Dascalu-Joffe
Senior General Counsel
Chesapeake Climate Action Network
6930 Carroll Ave, Suite 720
Takoma Park, MD 20912
Tel: (240) 396-1984
Email: Diana@chesapeakeclimate.org