



VIA EMAIL: ozone@otcair.org

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Ozone Transport Commission  
800 Maine Avenue SW  
Suite 200  
Washington, CD 20024

*RE: Comments Regarding Maryland Department of the Environment Section 184(c) Petition  
Talen Energy*

In a May 30, 2019 184(c) petition to the Ozone Transport Commission (OTC), the Maryland Department of the Environment (MDE or Maryland) has asked the OTC to propose to EPA that they impose additional NO<sub>x</sub> emission limits on Pennsylvania's coal-fired power plants (coal plants). In the petition Maryland asserts that the NO<sub>x</sub> controls on existing coal-fired power plants in Pennsylvania are not being run "in an optimized manner every day of the ozone season" and that, as a result, these plants are emitting "excess" pollution that negatively impacts Maryland. Of those plants Maryland identified in their petition Talen Energy owns and operates the Montour coal plant in north-central Pennsylvania and owns a partial share of the Keystone and Conemaugh, coal plants in western Pennsylvania. OTC has agreed to consider Maryland's request and is now soliciting public comment on: 1) whether the OTC should develop additional control measures for Pennsylvania, and if so, 2) how those specific control measures should be structured.

Talen, which owns power plants in Maryland, appreciate Maryland's efforts to achieve attainment of the NAAQS. Their diligent efforts, including resulted in attaining the 2008 ozone standard, a result not seen everywhere. Talen is grateful that their efforts to improve Maryland's air have always involved a cooperative approach in which they have sought input from the regulated community. However, at this time Talen believes it is inappropriate to develop additional control measures for Pennsylvania's coal plants because the impacts are uncertain and the proposed "straw-man" NO<sub>x</sub> limits are inappropriate.

Talen understands that Maryland has performed significant research, monitoring and modeling of the formation and transport of ozone in the Ozone Transport Region. However, it is a very complex issue, and a great deal of remaining uncertainty calls into question any estimate of the extent of any modeled contribution of Pennsylvania's coal plants to receptors in Maryland. For example, the data shows that the prevailing winds near the plant, not only for the ozone season, but even for specific Maryland ozone exceedance days, is from the west, not blowing toward Maryland. In addition, the data in Attachment 3 of Maryland's petition, reveals that there were multiple ozone exceedance days in Maryland when one or both units at Montour were not even running. Given the high cost of compliance across these multiple units in Pennsylvania, these uncertainties need to be resolved before any conclusions can be drawn concerning a connection between the changes proposed at individual Pennsylvania plants and the results that occur at Maryland receptors. At least for Montour, this raises doubt about the direct impact of changes to their NO<sub>x</sub> emissions on Maryland ozone monitors.

Additionally, Talen does not believe the additional limits proposed by Maryland are warranted for the following reasons:

1. There are flaws in the data that Maryland submitted. The data needs to be revised and we believe the analysis techniques may overestimate the benefits estimated by Maryland. Among other problems, the analysis failed to take into account changes in the operation of Montour because of market economics.
2. Montour is already controlling NOx adequately by complying with existing state and federal rules. Montour does not and cannot turn off its NOx controls on Maryland's high ozone days, because it must comply with these existing rules.
3. Additional stricter limits on plants like Montour are unachievable without significant additional costs.

### **Maryland Data Review**

The 184(c) petition calculates “excess” NOx emissions from Pennsylvania coal fired power plants on days that ozone exceedances were recorded in Maryland in 2017 and 2018. High end “excess” emissions are calculated as the difference between actual emissions from each coal-fired unit and the emissions that would have resulted if the unit had been operating at the “best (lowest) ozone season rate.” The best (lowest) ozone season rate is the lowest season-average rate achieved by each unit from 2005 to 2018. Low end “excess” NOx emissions are calculated using the highest (least restrictive) 30-day rolling average rate in the year that had the best (lowest) full ozone season rate.

In using the best ozone season rate to calculate “excess” emissions in the 2017/2018 ozone seasons, Maryland assumes that operation of each coal-fired unit in the 2017/2018 ozone seasons was similar to operation in the ozone season in which the lowest season-average rate was achieved. For the Montour units, this assumption is not correct and therefore results in an “apples to oranges” comparison which would substantially constrain future operation of the Montour units.

For Montour Units 1 and 2, the best (lowest) ozone season rate occurred in 2006. In 2006, the Montour units were largely baseload units which operated fairly consistently at high loads throughout the ozone season. This steady state operation allowed the units to achieve fairly low lb/MMBtu NOx rates throughout the ozone season, because the SCRs used to control the units operate consistently at high loads and in absence of many startup, shutdown, or low-load events.

In 2017 and 2018, due to changes in the electricity market economics, the Montour units had an operating profile that mimics “peaking units” with more startups, shutdowns and low load operations during the ozone season, as shown in Table 1 below. During startup events, which can take several hours, the SCR cannot control NOx emissions until the unit reaches a high enough load for the exhaust temperature to reach at least 600°F at the SCR inlet. It is at or above this temperature that the chemical reaction between ammonia and NOx for NOx removal can take place. Likewise, during shutdown, the SCR stops controlling NOx when the unit load and temperature drop. Lastly, when the unit is called by the system operator to drop to a minimum load, due to temporary lower demand (i.e., overnight), the SCR inlet temperature also drops below the required minimum. This inability to always operate the SCR during these periods results in high lb/MMBtu NOx rates during startups, shutdowns and low load operations.

*Table 1 Comparison of Ozone Season Operation*

Year	Unit	Operating Days	Startups	% of Operating Hours that are Low Load <sup>1</sup>
2006	1	144	1	8%
2006	2	149	3	2%

2017	1	63	6	37%
2017	2	63	4	39%
2018	1	71	6	27%
2018	2	36	5	27%

<sup>1</sup> Low load is assumed to be less than 400 MW.

Based on this data, calculations presented by Maryland for Montour Units 1 and 2 overestimates “excess” emissions because the units could not have operated at the “best (lowest) ozone season rate” in 2017/2018 due to changes in unit operation. As such, the premise that Montour could reduce emissions by the amounts indicated is incorrect.

Furthermore, Talen reviewed the analysis presented for Montour Units 1 and 2 to understand the methods used in quantifying what was claimed to be “excess” NOx emissions, but was unable to replicate the data. Specifically, we were not able to reproduce the max 30-day rolling average NOx emission rate presented in Attachment 6, Table 2. The best ozone season rate and the max 30-day rolling average rate presented by Maryland are identical for the Montour units, when it appears to us that the latter (the “max”) is (and should be) much higher than the former (“best”). Yet, 0.0558 lb/MMBtu is presented as both the best and max rate for Unit 1 and 0.0553 lb/MMBtu is presented as both the best and max rate for Unit 2. Thus, Talen was unable to reproduce the “excess” emissions reported for excess emission days using 2017/2018 CAMD data for the Montour Units 1 and 2. As such, Talen cautions the OTC that the NOx improvements (aka excesses) presented by Maryland are not likely available and that OTC should thoroughly review the supporting data, in its review.

### **Existing Rules**

Pennsylvania plants like Montour are already subject to the Cross-State Air Pollution Rule (CSAPR), updated in 2016 with additional reductions implemented in 2017. This EPA rule already addresses cross-state transport of NOx and the updated CSAPR rule set a NOx emission budget for all of Pennsylvania’s electric generating units (EGUs) that is less than half the actual NOx emissions from those units in 2015.

Pennsylvania coal plants like Montour are already subject to Pennsylvania RACT 2 regulations with a 30-day average emission limit of 0.12 lb/MMBtu NOx when a unit’s Selective Catalytic Reduction (SCR) control device can be operated. This limit effectively achieves the same reductions as Maryland’s proposed daily limit of 0.12 lb/MMBtu when units are operating at full/baseload conditions, as they were in Montour’s “best” controlled year of 2006.

In the petition, Maryland is proposing the same numerical limit as Pennsylvania’s RACT 2 limit, however, Maryland proposes it as a 24-hour block average emission limit, instead of a 30-day average, and to be applicable regardless of operating load. By structuring its RACT 2 limit based on a 30-day rolling average, Pennsylvania accounts for EGU load fluctuations, recognizing that the SCR cannot achieve the same NOx reductions when a unit is at a lower load. Maryland also took this into consideration in its own NOx RACT rules, by allowing for exceptions to daily limits during low loads, startup and shutdown. Applying a limit regardless of operating condition and regardless of the SCR’s ability to meet the limit is infeasible. If the goal is to have a coal plant meet a limit such as 0.12 lb/MMBtu on a daily basis when under feasible control conditions, then the existing RACT 2 rule suffices, even with its 30-day averaging period. With low to intermediate usage units like Montour and a 30-day rolling average limit, a unit cannot risk operating at high emission rates, because, given the intermittent operation, there may not be an extended period of high load that would allow low emissions to average out earlier high days.

**Stricter Limits Have a Significant Cost**

To achieve Maryland’s proposed limit on a daily basis, under all operating circumstances, a unit would have to over control considerably to account for potential upset conditions or low-load conditions later in the day. Contrary to assumptions, “optimizing existing controls” will have significant costs. Control of NOx to the strict levels proposed would require a combination of additional ammonia injection, optimal catalyst and/or lower NOx from the boiler. All of these add costs to the operations.

Extra ammonia injection not only adds the cost of ammonia, but too much ammonia can cause the plant’s ash to become ammoniated, thus reducing its salability and requiring it to be landfilled (a cost instead of a revenue). The greater the NOx reduction required, the quicker the catalyst is used and fouled. This in turn increases the frequency of catalyst replacement which would be an added cost to the plant.

Lastly, NOx at the stack can be reduced, if the boiler combustion is optimized for the lowest level of NOx formation. Unfortunately, tuning a boiler for lower NOx increases CO emissions and is a less efficient conversion of fuel to electricity. Less efficient combustion leads to more fuel being burned, which is another increase in operating cost. Requiring the plants to lower NOx below the levels required for RACT 2 will have an impact on the operating costs, and therefore, the viability of Pennsylvania coal plants like Montour.

Talen appreciates the opportunity to comment on OTC’s consideration of Maryland’s petition. As an owner of power plants in Maryland, we also appreciate Maryland’s efforts to achieve attainment of the NAAQS. Their diligent efforts resulted in attaining the 2008 ozone standard, a result not seen everywhere. However, as stated above, Talen feels OTC should not ask EPA to impose further NOx limitations on Pennsylvania coal plants because the impact is uncertain, Maryland’s supporting data and proposal are flawed, existing regulations have already made great strides, and additional controls will be costly.

Because Talen does not believe OTC should develop new limits, we have not responded to OTC’s second question about how the limits should be structured. If, however, OTC proceeds with developing a proposed rule to send to EPA, Talen would appreciate the opportunity to provide input. We are uniquely positioned given the fact that we have coal plants in Maryland and worked with Maryland in developing their regulations addressing daily NOx emissions from Maryland’s coal plants.

Sincerely,



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Talen Energy