UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

AUG 31 2018

MEMORANDUM

SUBJECT: Analysis of Contribution Thresholds for Use in Clean Air Act Section 110(a)(2)(D)(i)(I) Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards

FROM: Peter Tsirigotis
Director

TO: Regional Air Division Directors, Regions 1–10

The purpose of this memorandum is to provide analytical information regarding the degree to which certain air quality threshold amounts capture the collective amount of upwind contribution from upwind states to downwind receptors for the 2015 ozone National Ambient Air Quality Standards (NAAQS). It also interprets that information to make recommendations about what thresholds may be appropriate for use in state implementation plan (SIP) revisions addressing the good neighbor provision for that NAAQS. This document does not substitute for provisions or regulations of the Clean Air Act (CAA), nor is it a regulation itself. Rather, it provides recommendations for states using the included analytical information in developing SIP submissions, and for the Environmental Protection Agency (EPA) Regional offices in acting on them. Thus, it does not impose binding, enforceable requirements on any party. State air agencies retain the discretion to develop good neighbor SIP revisions that differ from this guidance.

Following these recommendations does not ensure that the EPA will approve a SIP revision in all instances where the recommendations are followed, as the guidance may not apply to the facts and circumstances underlying a particular SIP. Final decisions by the EPA to approve a particular SIP revision will only be made based on the requirements of the statute and will only be made following an air agency's final submission of the SIP revision to the EPA, and after appropriate notice and opportunity for public review and comment. Interested parties may raise comment about the appropriateness of the application of this guidance to a particular SIP revision. The EPA and air agencies should consider whether the recommendations in this guidance are appropriate for each situation.

Introduction

CAA section 110(a)(2)(D)(i)(I), otherwise known as the good neighbor provision, requires SIPs to prohibit emissions "which will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any" NAAQS. The EPA has historically used a 4-step framework to address upwind state obligations under the good neighbor provision for regional pollutants like ozone, which includes the following steps: (1) identify downwind areas, referred to as "receptors," expected to have problems attaining or maintaining the NAAQS; (2) identify upwind states that contribute to those downwind air quality problems and warrant further review and analysis; (3) identify the emissions reductions (if any) necessary to eliminate an upwind state's significant contribution to nonattainment and/or interference with maintenance of the NAAQS in the downwind areas, considering cost and air quality factors; and (4) adopt permanent and enforceable measures needed to achieve those emissions reductions. The EPA notes that, in developing their SIP revisions for the 2015 ozone NAAQS, states have flexibility to follow this framework or develop alternative frameworks to evaluate interstate transport obligations, so long as a state's chosen approach has adequate technical justification and is consistent with the requirements of the CAA

At Step 2, the EPA has used an air quality screening threshold to determine whether or not a state contributes to a downwind air quality problem in amounts that warrant further evaluation as part of a multi-factor analysis in Step 3. Upwind states that impact a downwind receptor by less than the screening threshold do not contribute to the downwind air quality problem at Step 2. The EPA has previously determined that such states do not significantly contribute to nonattainment or interfere with maintenance of the NAAQS under the good neighbor provision without additional analysis. Upwind states that impact a downwind receptor at or above the threshold are identified as contributing to a downwind air quality problem (i.e., they are said to be "linked" to that downwind receptor). The Step 3 analysis is then used to determine if the linked upwind state's contribution is "significant" or will "interfere with maintenance" of the NAAQS at the downwind receptor(s).[1]

Determining an appropriate screening threshold is a critical component of designing and then applying Step 2. Each time EPA sets a new or revised NAAQS, states and EPA can evaluate collective contribution to identify an appropriate threshold for that NAAQS. This assessment uses data and air quality analyses that are specifically applicable to the NAAQS being considered and the relevant air quality conditions (e.g., pollutant concentrations and the magnitude of interstate transport). As a result, conclusions made with respect to one NAAQS are not by default applicable to another NAAQS. In previous federal actions,[2] EPA's analysis of collective contribution concluded that a screening threshold equivalent to 1 percent of the 1997 and 2008 ozone NAAQS was appropriate at Step 2. In this document, we evaluate data pertinent to several alternative thresholds that could be applicable to the development of SIP revisions to address the 2015 ozone

[1] Note that upwind states that are linked to a downwind receptor at Step 2 may nevertheless be found to not significantly contribute to nonattainment or interfere with maintenance at the receptor depending on the outcome of the Step 3 analysis.

[2] In the Cross-State Air Pollution Rule (CSAPR), the EPA used 0.80 parts per billion (ppb) as the threshold, which is 1 percent of the 1997 ozone NAAQS. 76 FR 48208, 48238 (August 8, 2011). Most recently, in the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS (CSAPR Update), the EPA used 0.75 ppb as the threshold, which is 1 percent of the 2008 ozone NAAQS. 81 FR 74504, 74518 (October 26, 2016).

NAAQS of 70 ppb. We compare a threshold equivalent to 1 percent of the 2015 ozone NAAQS (i.e., a threshold of 0.70 ppb), consistent with EPA's previously applied screening thresholds at Step 2, as well as two alternative thresholds: 1 ppb and 2 ppb. The purpose of this analysis is to examine the amount of collective upwind contribution—i.e., the sum of contributions from states that are linked to each receptor—for each of these alternative thresholds. The data provided in this analysis are drawn from the results of EPA's updated 2023 modeling, which was released in a memorandum in March 2018.[3] The analysis presented here is similar to the analysis of alternative thresholds conducted to select the screening thresholds used in both the CSAPR and CSAPR Update rulemakings.[4,5] Based on the data and analysis summarized here, the EPA believes that a threshold of 1 ppb may be appropriate for states to use to develop SIP revisions addressing the good neighbor provision for the 2015 ozone NAAQS.

Methodology for Analyzing Alternative Thresholds

The EPA's 2023 state-by-state contribution modeling is used to calculate the absolute and relative amount of total upwind "collective contribution" captured by each of the three alternative thresholds evaluated in this analysis: 0.70 ppb (1 percent of the 2015 ozone NAAQS), 1 ppb, and 2 ppb. The ozone concentration and collective contribution data for each alternative threshold are provided in several tables, as described below. In the analysis of alternative screening thresholds, the EPA focused on data for the receptors outside of California since no other states were projected to impact any of the receptors in California at or above a threshold equivalent to 1 percent of the 2015 ozone NAAQS.[6] Data are therefore provided for each of the 2023 nonattainment and maintenance receptors outside of California identified using the CSAPR methodology for determining future year receptors.[7] In Table 1 below, we provide the projected 2023 average design value and the sum of the contributions from all upwind states (i.e., total upwind contribution) for each of these receptors. Table 1 further provides data on the amount of the total upwind contribution (ppb) that is captured by each of the three thresholds (i.e., the collective contribution) and at each receptor considered in this analysis. In Table 2 below, we express the amount of contribution captured at each alternative threshold considered in this analysis as a percent of the amount of the total upwind contribution. Finally, in Table 3 below, we compare the net amount of contribution captured at the 1 ppb and 2 ppb thresholds as a percentage of the amount of contribution captured at the 0.70 ppb, 1 percent threshold.

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[3] Information on the Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I) (March 2018). *https://www.epa.gov/airmarkets/march-2018-memo-and-supplemental-information-regarding-interstate-transport-sips-2015.*

[4] Air Quality Modeling Technical Support Document for the Final Cross State Air Pollution Rule Update (August 2016). *https://www.epa.gov/airmarkets/air-quality-modeling-technical-support-document-final-cross-state-air-pollution-rule.*

[5] Air Quality Modeling Final Rule Technical Support Document (for the Final Transport Rule now known as CSAPR; June 2011). *https://www.epa.gov/csapr/air-quality-modeling-final-rule-technical-support-document.*

[6] March 2018 Memo and Supplemental Information Regarding Interstate Transport SIPs for the 2015 Ozone NAAQS (March 2018). *https://www.epa.gov/airmarkets/march-2018-memo-and-supplemental-information-regarding-interstate-transport-sips-2015.*

[7] *See* 81 FR 74530-531.

Results

The data in the tables below indicate that, for the 2015 ozone NAAQS, the amount of upwind collective contribution captured using a 1 ppb threshold is generally comparable to the amount captured using a threshold equivalent to 1 percent of the NAAQS. In particular, the data in Table 1 indicate that using a 1 percent threshold captures 77 percent of the total upwind contribution when summed across all receptors. Overall, using a 1 ppb threshold captures 70 percent, which is a similar and only slightly lower amount of contribution. By contrast, using a 2 ppb threshold captures 55 percent, much less of the total contribution summed across all receptors. The data in Table 2 indicate that the percent of upwind contribution captured by a 1 percent and 1 ppb threshold at individual receptors are also of a similar magnitude at most sites. However, a 2 ppb threshold captures a notably lower portion of the total upwind contribution at most receptors. Finally, the data in Table 3 indicate that, on average across all receptors, a 1 ppb threshold captures 86 percent of the net contribution captured using a 1 percent threshold, whereas, a 2 ppb threshold captures only half of the net contribution using 1 percent.

Because the amount of upwind collective contribution captured with the 1 percent and 1 ppb thresholds is generally comparable, overall, we believe it may be reasonable and appropriate for states to use a 1 ppb contribution threshold, as an alternative to a 1 percent threshold, at Step 2 of the 4-step framework in developing their SIP revisions addressing the good neighbor provision for the 2015 ozone NAAQS. Although the 1 ppb threshold captures somewhat less upwind contribution across receptors than the 1 percent threshold, the 1 ppb threshold still generally captures a substantial amount of transported contribution from upwind states to downwind receptors. Thus, the use of a 1 ppb threshold to identify linked upwind states still provides the potential, at Step 3, for meaningful emission reductions in linked upwind states in order to aid downwind states with attainment and maintenance of the 2015 ozone NAAQS. However, the amount of upwind contribution captured using a 2 ppb threshold is notably less at most receptors than the amount captured with either a 1 ppb or 1 percent threshold, and therefore emission reductions from states linked at that higher threshold may be insufficient to address collective upwind state contribution to downwind air quality problems.

Please share this information with the air agencies in your Region.

For Further Information

If you have any questions concerning this memorandum, please contact Norm Possiel at (919) 541-5692, *possiel.norm@epa.gov* for modeling information or Beth Palma at (919) 541-5432, *palma.elizabeth@epa.gov* for any other information.

Table 1. Total upwind contribution and the sum of upwind contribution at each receptor captured using each alternative threshold (units are ppb).

Site	State	County	2023 Average Design Value	Total Upwind State Contribution	Sum of Upwind Contribution Captured with 0.70 ppb Threshold	Sum of Upwind Contribution Captured with 1 ppb Threshold	Sum of Upwind Contribution Captured with 2 ppb Threshold
40130019	AZ	Maricopa	69.3	2.55	1.87	1.87	0.00
40131004	AZ	Maricopa	69.8	2.58	2.03	2.03	2.03
80050002	CO	Arapahoe	69.3	5.98	3.47	3.47	0.00
80350004	CO	Douglas	71.1	5.94	3.35	3.35	0.00
80590006	CO	Jefferson	71.3	7.06	4.68	2.34	0.00
80590011	CO	Jefferson	70.9	6.98	4.51	3.57	0.00
80690011	CO	Larimer	71.2	6.33	3.48	2.60	0.00
81230009	CO	Weld	70.2	5.63	2.77	1.05	0.00
90010017	CT	Fairfield	68.9	37.44	32.15	32.15	28.66
90013007	CT	Fairfield	71.0	41.29	36.91	33.63	27.38
90019003	CT	Fairfield	73.0	44.24	38.55	36.93	32.28
90099002	CT	New Haven	69.9	35.25	29.49	28.76	24.96
240251001	MD	Harford	70.9	25.88	20.16	17.79	14.92
260050003	MI	Allegan	69.0	42.90	38.87	36.63	31.73
261630019	MI	Wayne	69.0	17.63	11.81	10.89	8.69
360810124	NY	Queens	70.2	30.68	23.73	23.00	15.73
361030002	NY	Suffolk	74.0	28.82	22.31	18.74	15.74
480391004	TX	Brazoria	74.0	13.36	7.48	4.80	3.80
481210034	TX	Denton	69.7	8.64	3.15	3.15	0.00
482010024	TX	Harris	70.4	8.19	3.06	3.06	3.06
482011034	TX	Harris	70.8	9.86	3.38	3.38	3.38
482011039	TX	Harris	71.8	13.01	8.26	4.72	4.72
484392003	TX	Tarrant	72.5	10.06	4.20	3.42	0.00

Site	State	County	2023 Average Design Value	Total Upwind State Contribution	Sum of Upwind Contribution Captured with 0.70 ppb Threshold	Sum of Upwind Contribution Captured with 1 ppb Threshold	Sum of Upwind Contribution Captured with 2 ppb Threshold
550790085	WI	Milwaukee	71.2	32.58	28.45	23.61	22.39
551170006	WI	Sheboygan	72.8	36.53	31.62	29.02	24.90
Percent of Overall Upwind Contribution Captured =>					77%	70%	55%

Table 2. Percent of the upwind contribution captured by each alternative threshold at each receptor.

Site	State	County	Percent of Upwind Contribution Captured using a 0.70 ppb Threshold	Percent of Upwind Contribution Captured using a 1 ppb Threshold	Percent of Upwind Contribution Captured using a 2 ppb Threshold
40130019	AZ	Maricopa	73.3%	73.3%	0.0%
40131004	AZ	Maricopa	78.7%	78.7%	78.7%
80050002	CO	Arapahoe	58.0%	58.0%	0.0%
80350004	CO	Douglas	56.4%	56.4%	0.0%
80590006	CO	Jefferson	66.3%	33.1%	0.0%
80590011	CO	Jefferson	64.6%	51.1%	0.0%
80690011	CO	Larimer	55.0%	41.1%	0.0%
81230009	CO	Weld	49.2%	18.7%	0.0%
90010017	CT	Fairfield	85.9%	85.9%	76.5%
90013007	CT	Fairfield	89.4%	81.4%	66.3%
90019003	CT	Fairfield	87.1%	83.5%	73.0%
90099002	CT	New Haven	83.7%	81.6%	70.8%
240251001	MD	Harford	77.9%	68.7%	57.7%
260050003	MI	Allegan	90.6%	85.4%	74.0%

Site	State	County	Percent of Upwind Contribution Captured using a 0.70 ppb Threshold	Percent of Upwind Contribution Captured using a 1 ppb Threshold	Percent of Upwind Contribution Captured using a 2 ppb Threshold
261630019	MI	Wayne	67.0%	61.8%	49.3%
360810124	NY	Queens	77.3%	75.0%	51.3%
361030002	NY	Suffolk	77.4%	65.0%	54.6%
480391004	TX	Brazoria	56.0%	35.9%	28.4%
481210034	TX	Denton	36.5%	36.5%	0.0%
482010024	TX	Harris	37.4%	37.4%	37.4%
482011034	TX	Harris	34.3%	34.3%	34.3%
482011039	TX	Harris	63.5%	36.3%	36.3%
484392003	TX	Tarrant	41.7%	34.0%	0.0%
550790085	WI	Milwaukee	87.3%	72.5%	68.7%
551170006	WI	Sheboygan	86.6%	79.4%	68.2%

Table 3. Percent of the contribution captured with a 0.70 ppb threshold that is captured using 1 ppb and 2 ppb thresholds.

Site	State	County	Contribution Captured with 1 ppb Threshold vs a 0.70 ppb Threshold	Contribution Captured with 2 ppb Threshold vs a 0.70 ppb Threshold
40130019	AZ	Maricopa	100.0%	0.0%
40131004	AZ	Maricopa	100.0%	100.0%
80050002	CO	Arapahoe	100.0%	0.0%
80350004	CO	Douglas	100.0%	0.0%
80590006	CO	Jefferson	50.0%	0.0%
80590011	CO	Jefferson	79.2%	0.0%
80690011	CO	Larimer	74.7%	0.0%
81230009	CO	Weld	37.9%	0.0%
90010017	CT	Fairfield	100.0%	89.1%

Site	State	County	Contribution Captured with 1 ppb Threshold vs a 0.70 ppb Threshold	Contribution Captured with 2 ppb Threshold vs a 0.70 ppb Threshold
90013007	CT	Fairfield	91.1%	74.2%
90019003	CT	Fairfield	95.8%	83.7%
90099002	CT	New Haven	97.5%	84.6%
240251001	MD	Harford	88.2%	74.0%
260050003	MI	Allegan	94.2%	81.6%
261630019	MI	Wayne	92.2%	73.6%
360810124	NY	Queens	96.9%	66.3%
361030002	NY	Suffolk	84.0%	70.6%
480391004	TX	Brazoria	64.2%	50.8%
481210034	TX	Denton	100.0%	0.0%
482010024	TX	Harris	100.0%	100.0%
482011034	TX	Harris	100.0%	100.0%
482011039	TX	Harris	57.1%	57.1%
484392003	TX	Tarrant	81.4%	0.0%
550790085	WI	Milwaukee	83.0%	78.7%
551170006	WI	Sheboygan	91.8%	78.7%
Average Percent Captured =>			86%	51%