




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

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MEMORANDUM

SUBJECT: Information on the Interstate Transport “Good Neighbor” Provision for the 2012 Fine Particulate Matter National Ambient Air Quality Standards under Clean Air Act Section 110(a)(2)(D)(i)(I)

FROM: Stephen D. Page
Director 

TO: Regional Air Division Directors, Regions 1 – 10

The purpose of this memorandum is to provide information to the Environmental Protection Agency Regional offices and the states as they develop and review state implementation plans (SIPs) that address the interstate transport provision of the Clean Air Act (CAA) section 110(a)(2)(D)(i)(I), otherwise known as the “Good Neighbor” provision, as it pertains to the 2012 fine particulate matter (PM_{2.5}) National Ambient Air Quality Standards (NAAQS).¹ This memo provides future year annual PM_{2.5} design values for monitors in the United States based on quality assured and certified ambient monitoring data and air quality modeling. The memo further describes how these projected potential design values can be used to help determine which monitors (*i.e.*, receptors) should be further evaluated to potentially address if emissions from other states significantly contribute to nonattainment or interfere with maintenance of the PM_{2.5} NAAQS at these monitoring sites. This memorandum consists of:

- a description of the framework that has been previously used to address the good neighbor provision, and
- the EPA’s review of relevant modeling data and air quality projections as they relate to this NAAQS.

The EPA’s goal in providing this information is to initiate discussions that will facilitate state development and the EPA’s review of SIPs addressing the good neighbor provision with respect to the 2012 PM_{2.5} NAAQS. At this time, there are a number of states that may not have submitted SIPs addressing the good neighbor provision. There are also a number of states that have submitted SIPs addressing the good neighbor provision that the EPA will need to review and act on in the near future. The information in this memo and the associated receptor data are not intended to be a definitive or final

¹ On December 14, 2012, the EPA revised the annual PM_{2.5} standard by lowering the level to 12.0 micrograms per cubic meter (ug/m³). National Ambient Air Quality Standards for Particulate Matter, 78 FR 3086 (January 15, 2013).

conclusion about which receptors may have air quality problems with respect to the 2012 PM_{2.5} standard.

The “Good Neighbor” Provision

Under CAA sections 110(a)(1) and 110(a)(2), each state² is required to submit a SIP³ that provides for the implementation, maintenance and enforcement of each primary or secondary NAAQS.

Section 110(a)(1) requires each state to make this new SIP submission within 3 years after promulgation of a new or revised NAAQS.⁴ This type of SIP submission is commonly referred to as an “infrastructure SIP.” Section 110(a)(2) includes a list of specific elements that each such plan submission must meet.

The conceptual purpose of an infrastructure SIP submission is to assure that the state’s SIP contains the necessary structural requirements for the implementation of the new or revised NAAQS, whether by demonstrating that the state’s SIP already contains or sufficiently addresses the necessary provisions, or by making a substantive SIP revision to update the plan provisions.

In particular, section 110(a)(2)(D)(i)(I) requires each state to submit to the EPA new or revised SIPs that “contain adequate provisions . . . prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the state from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any such national primary or secondary ambient air quality standard.” For purposes of this document, we refer to section 110(a)(2)(D)(i)(I) as the “good neighbor” provision and to SIP revisions addressing this requirement as “good neighbor” SIPs. For the most recent annual PM_{2.5} NAAQS promulgated on December 14, 2012, the infrastructure SIPs, including good neighbor SIPs, were due by December 14, 2015.

Framework That Has Been Used Previously to Address the “Good Neighbor” Provision

The EPA has developed a consistent framework for addressing interstate transport with respect to the PM_{2.5} NAAQS in several previous federal rulemakings.⁵ The four basic steps of that framework include: (1) identifying downwind receptors that are expected to have problems attaining or maintaining the NAAQS; (2) identifying which upwind states contribute to these identified problems in amounts sufficient to warrant further review and analysis; (3) for states identified as contributing to downwind air quality problems, identifying upwind emissions reductions necessary to prevent an upwind state from significantly contributing to nonattainment or interfering with maintenance of the NAAQS downwind;

² The term “state” as used in this memorandum has the same meaning as provided in CAA section 302(d). These CAA sections and this information may also apply, as appropriate under the Tribal Authority Rule (TAR) in 40 CFR part 49, to an Indian tribe that receives a determination of eligibility for treatment in a similar manner as a state for purposes of administering a tribal air quality management program under section 110(a) of the CAA. Tribes should look to the TAR and engage their respective EPA Regional offices in discussing how this information may impact the development and approvability of their tribal implementation plans (TIPs). We encourage states to provide outreach and engage in discussions with tribes about their SIPs as they are being developed.

³ In the CAA and in this memorandum, “plan,” “SIP” and “TIP” may, depending on context, refer either to (i) all or part of the existing state (or tribal) implementation plan (*i.e.*, the collection of all submissions previously approved by the EPA as meeting CAA requirements) or (ii) a submission that adds to or modifies the existing plan as directed by section 110(a)(1).

⁴ The Administrator may specify a shorter period.

⁵ See, for example, Clean Air Interstate Rule Final Rule, 70 FR 25162 (May 12, 2005); CSAPR Final Rule, 76 FR 48208 (August 8, 2011); *cf.* Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, Final Rule, 63 FR 57356 (October 27, 1998).

and (4) for states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, reducing the identified upwind emissions through adoption of permanent and enforceable measures. This framework was most recently applied in the Cross-State Air Pollution Rule (CSAPR), designed to address both the 1997 and 2006 PM_{2.5} standards, as well as the 1997 ozone standard.

In this document, we only discuss steps (1) and (2) in detail. As discussed below, we anticipate that there will be few areas in the United States expected to have problems attaining and maintaining the 2012 PM_{2.5} NAAQS due to the relatively small number and limited geographic scope of projected nonattainment and maintenance receptors. We expect that steps (3) and (4) would be best addressed on a case-by-case basis.

Step 1. Identification of Potential Downwind Nonattainment and Maintenance Receptors

The EPA has assessed downwind PM_{2.5} air quality problems in recent federal rulemakings based on estimates of air quality concentrations in a future year aligned with the relevant attainment deadline for areas designated nonattainment for the relevant standard. This is consistent with the instructions from the D.C. Circuit in *North Carolina v. EPA*, 531 F.3d 896, 911-12 (2008), that upwind emission reductions should be harmonized, to the extent possible, with the attainment deadlines for downwind areas.⁶ In assessing future air quality conditions, the EPA has considered on-the-books emissions reductions and the most up-to-date forecast of future baseline emissions that would occur by the attainment deadline. The locations of projected downwind air quality problems have typically been identified from the results of air quality modeling as those receptors that were projected to be unable to attain or maintain the NAAQS in the future analysis year.

In developing CSAPR, the EPA identified nonattainment receptors for the 1997 and 2006 PM_{2.5} standards as those receptors that were expected to have nonattainment problems in the relevant future year based on the average design values projected in air quality modeling analyses. Maintenance receptors were identified as those receptors with a potential for having difficulty maintaining the NAAQS, taking into account a measure of variability. The variability in air quality was determined by evaluating the maximum future design value at each receptor based on a projection of the maximum measured design value. All nonattainment receptors were also identified as maintenance receptors since a site with a projected average design value above the standard necessarily also has a projected maximum design value above the standard.

On December 3, 2015, the EPA proposed a refinement to the CSAPR approach in the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS, 80 FR 75705 (December 3, 2015) (CSAPR Update). In the proposed CSAPR Update, the EPA proposed to retain the process for identifying maintenance receptors for the 2008 ozone standard as those receptors that would have difficulty maintaining the relevant NAAQS by evaluating the maximum future design value at each receptor. However, the EPA proposed to modify the definition of a nonattainment receptor to incorporate consideration of current monitoring data. The EPA proposed to identify a nonattainment receptor as one that is both projected to be in nonattainment (based on the average design value) and that currently

⁶ Areas that were designated as Moderate PM_{2.5} nonattainment areas for the 2012 annual PM_{2.5} NAAQS in 2014 must attain the NAAQS by December 31, 2021, (the end of the 6th calendar year after designation) or as expeditiously as practicable.

measures nonattainment. Those sites that are projected to be nonattainment based on the average design value but currently measuring clean data (based on the most recent certified design value data) are proposed to be identified as maintenance-only receptors. The EPA did not propose to exclude such receptors from the analysis entirely, as even those receptor sites that are not currently monitoring violations may still experience future emissions levels and/or meteorological conditions that may cause violations to reoccur and therefore have future maintenance concerns.

In order to develop data that may be useful for analyzing interstate transport with respect to the 2012 PM_{2.5} NAAQS, the EPA examined recent modeling analyses developed in support of other EPA rules⁷ in order to identify potential PM_{2.5} nonattainment and maintenance receptors. The available modeling used the CAMx photochemical model with base case emissions and meteorology for 2011.⁸ Modeling results were available for future projection years of 2017 and 2025. Attachment 1 contains more details on the base and future year EPA modeling.

From this air quality modeling, PM_{2.5} concentration results were available and further post-processing⁹ was performed to calculate projected design values for the 2012 annual PM_{2.5} NAAQS. For each ambient monitoring site, the EPA calculated the projected average design value and projected maximum design value for the future projection years of 2017 and 2025.¹⁰ Consistent with the approach used in CSAPR, the average projected design value was used to identify potential “nonattainment” receptors, while the maximum projected design value was used to identify potential “maintenance” receptors.

As the refinement for identifying nonattainment receptors proposed in the CSAPR Update has not yet been finalized, the EPA has not incorporated consideration of monitored data into its analysis of potential nonattainment and maintenance receptors for the 2012 PM_{2.5} NAAQS. However, as noted above, both the original CSAPR rulemaking and the CSAPR Update identify all nonattainment receptors as also being maintenance receptors. Accordingly, while the refinement proposed in the CSAPR Update might change the identification of certain potential receptors from nonattainment to maintenance-only, such receptors remain air quality problems that need to be addressed.

Table 1 identifies 19 potential nonattainment and/or maintenance receptors in 2017. Seventeen of the receptors are in California, located either in the San Joaquin Valley or South Coast nonattainment areas. There is one additional projected receptor in Shoshone County, Idaho, and one receptor in Allegheny

⁷ CSAPR Update, Proposed Rule, 80 FR 75705; National Ambient Air Quality Standards for Ozone, Final Rule, 80 FR 65291 (October 26, 2015) (2015 ozone NAAQS).

⁸ The base modeling year was 2011, and, therefore, based on recommendations in the PM_{2.5} modeling guidance, ambient monitoring data for the 2009-2013 period was projected to the future (the 2009-2011, 2010-2012, and 2011-2013 design values). There are several states that have had recent data quality issues identified as part of the PM_{2.5} designations process. Some ambient PM_{2.5} data (for certain time periods between 2009 and 2013) in Florida (except Palm Beach County), Illinois, Idaho, Tennessee (except Hamilton County), and Jefferson County, Kentucky, did not meet all data quality requirements under 40 CFR Appendix L to part 50. The ambient data that were determined to be not valid were not used in the projections of data to 2017 and 2025. Documentation of the data quality issues can be found in the 2012 PM_{2.5} NAAQS designations rule docket (docket number EPA-HQ-OAR-2012-0918).

⁹ See Attachment I for details on the model post-processing calculation of future year design values.

¹⁰ The analysis was completed for all ambient monitoring sites that had at least one complete (and valid) PM_{2.5} design value for the annual average 2012 NAAQS in the 2009-2013 period.

County, Pennsylvania (located in the Allegheny County nonattainment area). All of the receptors, except for the Allegheny County receptor, are projected to remain problem receptors in 2025.¹¹ Attachment 1 contains more details on the future year design value analysis. Attachment 2 includes projected design values for all PM_{2.5} monitors in the Continental U.S. with valid data.

Table 1. Potential nonattainment and maintenance receptors for the 2012 PM_{2.5} NAAQS in 2017 and 2025.

Monitor ID	State	County	Projected 2017 Attainment Status	Projected 2025 Attainment Status
60190011	California	Fresno	Nonattainment	Nonattainment
60195001	California	Fresno	Nonattainment	Nonattainment
60195025	California	Fresno	Nonattainment	Nonattainment
60250005	California	Imperial	Nonattainment	Nonattainment
60290014	California	Kern	Nonattainment	Nonattainment
60290016	California	Kern	Nonattainment	Nonattainment
60311004	California	Kings	Nonattainment	Nonattainment
60371002	California	Los Angeles	Maintenance	Maintenance
60392010	California	Madera	Nonattainment	Nonattainment
60470003	California	Merced	Nonattainment ^a	Nonattainment
60658001	California	Riverside	Nonattainment	Maintenance
60658005	California	Riverside	Nonattainment	Nonattainment
60990006	California	Stanislaus	Nonattainment	Nonattainment
60990005	California	Stanislaus	Nonattainment	Maintenance
60710025	California	San Bernardino	Maintenance	Maintenance
60771002	California	San Joaquin	Maintenance	Maintenance
61072002	California	Tulare	Nonattainment	Nonattainment
160790017	Idaho	Shoshone	Maintenance	Maintenance
420030064	Pennsylvania	Allegheny	Maintenance	Attainment

^a The Merced County monitor is attaining the 2012 PM_{2.5} NAAQS based on the most recent certified air quality data (2012-2014). Therefore, in the proposed CSAPR Update, the receptor would be considered to be a maintenance receptor in both 2017 and 2025.

For purposes of evaluating interstate transport consistent with the court’s holding in *North Carolina*, it may be appropriate to evaluate projected air quality in 2021, which is the attainment deadline for 2012 PM_{2.5} NAAQS nonattainment areas classified as Moderate. Since modeling results are only available for

¹¹ The EPA modeling does not consider additional local controls that might be required as part of reasonably available control technology/reasonably available control measure and other reasonable measures that must be implemented in nonattainment areas as part of their SIP planning process. In addition, if the areas do not attain the NAAQS by 2021 and are reclassified as Serious nonattainment areas, they will be required to impose best available control technology/best available control measure controls as part of their Serious area SIP.

2017 and 2025, one way to assess potential receptors for 2021 is to assume that receptors projected to have average and/or maximum design values above the NAAQS in both 2017 and 2025 are also likely to be either nonattainment or maintenance receptors in 2021. Similarly, it may be reasonable to assume that receptors that are projected to attain the NAAQS in both 2017 and 2025 are also likely to be attainment receptors in 2021. Where a potential receptor is projected to be nonattainment or maintenance in 2017, but projected to be attainment in 2025, further analysis of the emissions and modeling may be needed to make a further judgement regarding the receptor status in 2021. *See* Attachment 1 for a more detailed discussion of the potential receptor status in 2021.

In relying on the information provided in this memo, states should consider that there are no projected PM_{2.5} design values for certain downwind states or counties with incomplete ambient monitoring data (*see* footnote 8). In evaluating their contribution to potential air quality problems in those areas that may not have been identified by the EPA's modeling, possible upwind states (especially those bordering the particular downwind states or counties identified in footnote 8) should consider additional data and information, such as the latest available ambient monitoring data (*e.g.*, 2014 and 2015) for those downwind states or counties. These possible upwind states should work with their EPA Regional offices to develop approvable demonstrations showing, where possible, that they will not contribute significantly or interfere with maintenance of the 2012 PM_{2.5} NAAQS in any downwind state.

The information provided in this memo may be supplemented with any additional technical information that states believe is relevant for consideration. States may also choose to use different information from what is provided in this memo in order to identify nonattainment and maintenance receptors relevant to development of their good neighbor SIPs, in which case states should submit that information along with a full explanation and technical analysis for evaluation by the EPA.

Step 2. Identification of States Contributing to Downwind Nonattainment Maintenance Receptors

In the past, the EPA has used source apportionment "contribution modeling" in tandem with a screening threshold to identify contributing upwind states warranting further review and analysis. States whose contribution to an air quality impact at one or more downwind problem receptors was greater than or equal to the screening threshold were identified as needing further evaluation for actions to address transported emissions. States whose contribution to air quality impacts at all downwind problem receptors that were below this threshold were identified as states not requiring further evaluation for actions to address transported emissions. These latter states had no emissions reduction obligation under the good neighbor provision because they make an insignificant contribution to identified downwind air quality problems.

Where concentration estimates have been available, but contribution modeling has not been available, the EPA and states have used a weight of evidence approach to assess PM_{2.5} transport from a given state to a given downwind receptor location. A state's submission for this requirement should provide the technical information that the state deems appropriate to support its conclusions. Prior guidance and EPA SIP actions suggest that suitable information might include, but is not limited to, information concerning emissions in the state, meteorological conditions in the state and in potentially impacted states, monitored ambient pollutant concentrations in the state and in potentially impacted states,

distances to the nearest areas not attaining the NAAQS in other states, and air quality modeling.¹² As an example, the February 23, 2015, *Federal Register* notice for the proposed rulemaking addressing the Idaho State Implementation Plan for Interstate Transport of Fine Particulate Matter examined technical information, including meteorological and other characteristics, as well as source apportionment data that provides information on how Idaho sources influence PM_{2.5} levels at monitors in National Parks and wilderness areas surrounding Idaho. This submittal demonstrated by total weight of all the evidence taken together that sources from Idaho did not significantly contribute to nonattainment or interfere with maintenance of the applicable NAAQS in any other state.¹³

The EPA has not conducted, and does not plan to conduct, contribution modeling for purposes of the 2012 PM_{2.5} NAAQS. Given the limited number of receptors and their locations, nationwide contribution modeling by the EPA or the states does not appear to be necessary at this time. The EPA believes that a proper and well-supported weight of evidence approach could provide sufficient information for purposes of addressing transport with respect to the 2012 PM_{2.5} NAAQS. It is, however, important and necessary that states work with their EPA Regional offices to ensure that the submittals provide an adequate technical basis for any conclusions regarding contribution to other states.

Conclusion

As noted above, the EPA expects that, with support from the modeling described in Attachment 1 and a weight of evidence assessment of a state's contribution to any identified problem receptor(s), most states will be able to develop good neighbor SIPs that demonstrate that they do not contribute significantly to nonattainment or interfere with maintenance of the 2012 PM_{2.5} NAAQS in any downwind state. These SIPs will need to contain adequate information and a technical analysis to support this demonstration. If such a demonstration cannot be made, states should evaluate available measures for achieving any necessary and timely emission reductions to address the state's significant contribution to nonattainment or interference with maintenance of the NAAQS in downwind states.

For Further Information

If you have any questions concerning this information, please contact Lev Gabrilovich, at (919) 541-1496, Gabrilovich.Lev@epa.gov.

Attachments (2)

¹² See *id.* See also "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle (PM_{2.5}) National Ambient Air Quality Standards (NAAQS)," Memorandum from William T. Harnett, Director, Air Quality Policy Division (September 25, 2009). This guidance provided that each state's SIP submission for the 2006 24-hour PM_{2.5} NAAQS should explain whether emissions from the state significantly contribute to nonattainment of the NAAQS or interference with maintenance of the NAAQS in any other state, including technical information to support the state's conclusion, and should address any such impact. This guidance is available online at http://www3.epa.gov/ttn/caaa/t1/memoranda/20090925_harnett_pm25_sip_110a12.pdf.

¹³ See Proposed Rule, Approval and Promulgation of the Idaho State Implementation Plan for Interstate Transport of Fine Particulate Matter, 80 FR 9423 (February 23, 2015). See Final Rule, Approval and Promulgation of the Idaho State Implementation Plan for Interstate Transport of Fine Particulate Matter, 80 FR 21181 (April 17, 2015).