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NATURAL RESOURCES

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JUN 10 2019

Mr. Jim Gulliford
Regional Administrator
U.S. EPA, Region VII
11201 Renner Boulevard
Lenexa, KS 66219

Dear Mr. Gulliford:

The Missouri Department of Natural Resources' Air Pollution Control Program (air program) hereby submits the following State Implementation Plan (SIP) revision for your approval:

Interstate Transport Provisions for the 2015 Ozone Standard

Through this submission, the air program is requesting that the U.S. Environmental Protection Agency (EPA) take the following actions:

Approve Missouri's SIP as meeting Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 ozone National Ambient Air Quality Standard (NAAQS);

The Missouri Air Conservation Commission adopted this SIP revision at the May 30, 2019, commission meeting. The commission has full legal authority to develop SIP revisions pursuant to Section 643.050 of the Missouri Air Conservation Law. The air program held a public hearing for the plan on March 28, 2019. The air program accepted comments on the plan from February 25, 2019, through April 4, 2019. During the public comment period, the air program received written comments from EPA, Associated Electric Cooperative Incorporated, Ameren Missouri, and Dave Flannery of Steptoe Johnson on behalf of the Midwest Ozone Group. A summary of the comments and the air program's responses are attached.

Enclosed are the required submittal elements for determination of plan completeness per 40 CFR Part 51, Appendix V. The air program is providing a searchable pdf version of this document through EPA's State Planning Electronic Collaboration System (SPECS) and the air program will post the complete submittal package on our website at <https://dnr.mo.gov/env/apcp/ozone.htm>.

Thank you for your attention to this matter. If you have any questions regarding this submittal, please contact Ms. Emily Wilbur with the Missouri Department of Natural Resources' Air



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Mr. Jim Gulliford
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Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 751-4817.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



Darcy A. Bybee
Director

DAB: clc

Enclosures:

Copy of plan
Copy of commission signature page certifying Missouri Air Conservation Commission adoption
Copy of public hearing notices
Copy of public hearing transcript introductory statement
Copy of recommendation for adoption
Copy of the summary of comments and responses

c: Missouri Air Conservation Commission
File# 2015-O3-6 Transport

Missouri State Implementation Plan Revision

Interstate Transport Provisions for the 2015 Ozone Standard

**Prepared for the
Missouri Air Conservation Commission**



**Adoption
May 30, 2019**

**Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Jefferson City, Missouri**

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Executive Summary

The purpose of the State Implementation Plan (SIP) revision included in this document is to address Missouri's interstate air pollution transport obligations for the 2015 ozone National Ambient Air Quality Standard (NAAQS). Specifically, this SIP revision addresses Missouri's requirements under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS. This section of the CAA requires states to include adequate provisions in their SIPs to prohibit emissions that will contribute significantly to nonattainment, or interfere with maintenance, in any downwind state with respect to any NAAQS. These interstate air pollution transport obligations help ensure that emissions in one state are not causing or contributing to air pollution problems in another state, and are often referred to as good neighbor SIPs.

Missouri's good neighbor SIP under the 2015 ozone NAAQS follows the U.S. Environmental Protection Agency (EPA)'s four-step approach and corresponding memorandums for determining obligations for upwind states to limit transported air pollution to downwind states. The analysis and conclusions in this document stem largely from modeling performed by EPA to determine ozone concentrations across the country and the corresponding contributions from upwind states in the year 2023. This future year corresponds to the year before the attainment deadline for areas designated as moderate nonattainment areas under the 2015 ozone NAAQS. Based on this analysis, after implementation of all on-the-books control measures in Missouri and other upwind states, emissions from Missouri will not contribute significantly to nonattainment or interfere with maintenance of the 2015 ozone NAAQS in any downwind states.

Through the SIP revision and corresponding technical demonstration included in this document, the Missouri Department of Natural Resources' Air Pollution Control Program (air program) is requesting EPA to fully approve Missouri's SIP under CAA Section 110(a)(2)(D)(i)(I) with respect to the 2015 ozone NAAQS.

1. Background

On October 26, 2015, the EPA finalized a revised NAAQS for ground-level ozone.¹ The revision strengthened the primary and secondary standards, decreasing them from 0.075 parts per million (ppm) to 0.070 ppm, based on the 3-year average of the annual fourth-highest 8-hour daily maximum concentrations.

Ozone is a secondary pollutant formed when precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) react under the presence of sunlight. In some cases, these precursor emissions can travel tens or hundreds of miles downwind from the emission source before reaching an area where the precursor emissions mix and the atmospheric conditions lead to a build-up of ground-level ozone concentrations. For this reason, determining upwind state contributors to downwind state ozone problems is a highly technical and complex problem to solve. Since EPA promulgated the first 8-hour ground-level ozone NAAQS in 1997, the states and EPA have made numerous attempts to implement CAA Section 110(a)(2)(D)(i)(I) in an effort to solve the problem of transported ozone pollution. The federal judicial system, including the United States Supreme Court, has heard numerous cases concerning this very problem and the states and EPA have implemented numerous state and federal regulations over the years in an effort to address ozone transport, particularly in the eastern half of the country.

These efforts have resulted in dramatic improvement in ozone concentrations across the eastern U.S., and have led to a four-step process for determining an upwind state's contribution to downwind state ozone nonattainment and maintenance problems along with the corresponding obligations of such upwind states. This process continues to improve and evolve, and under the 2015 ozone standard, EPA has provided invaluable technical support and guidance documents to aide states in determining their obligations under the CAA's good neighbor provision for this standard.

1.1. Good Neighbor Obligations for the 1997 and 2008 Ozone NAAQS

EPA originally promulgated the NO_x SIP call and the NO_x budget program to address both 1979 and the 1997 ozone standards; however, EPA subsequently stayed the implementation of the NO_x SIP Call for purposes of addressing the 1997 ozone standard.² Therefore, when EPA implemented the NO_x Budget Program it only addressed the 1979 ozone standard. Under the 1997 ozone standard, EPA promulgated all of the following federal rulemakings in an attempt to address the Clean Air Act's good neighbor provision under that standard: the NO_x SIP Call, the Clean Air Interstate Rule (CAIR), and ultimately the Cross-State Air Pollution Rule (CSAPR). While the NO_x SIP Call remains in effect, the NO_x Budget Program and CAIR were replaced by CSAPR. These three programs all aimed to address CAA good neighbor obligations under the 1997 ozone standard for over twenty states located in the eastern half of the country primarily through the establishment of a multi-state cap and trade program that reduced NO_x emissions from power plants and other large NO_x emission sources located in these eastern states that contributed to ozone problems in downwind states. The U.S. Supreme Court has upheld the

¹ 80 FR 65291, October 1, 2015

² 65 FR 56245, September 18, 2000

general framework and process to inform the federal CSAPR, and states across the country are now using this framework to inform their good neighbor SIPs under the 2015 ozone standard.

1.1.1. Cross-State Air Pollution Rule

On July 6, 2011, EPA finalized the Cross-State Air Pollution Rule (CSAPR) to address air pollution from upwind states that crosses state lines and affects air quality in downwind states.³ This rule requires certain states in the eastern half of the U.S. to improve air quality by reducing power plant NO_x emissions that cross state lines and contribute to ground-level ozone pollution in downwind states. The CSAPR reduced air quality impacts of ozone pollution that crossed state lines and helped downwind areas meet and maintain the 1997 ozone standard.

1.1.2. Cross-State Air Pollution Rule Update

On October 26, 2016, EPA finalized the CSAPR Update rule to address CAA good neighbor obligations under the 2008 ozone NAAQS.⁴ The CSAPR Update rule largely replaced the original CSAPR ozone season NO_x program as of May 1, 2017. The CSAPR Update rule further reduced summertime NO_x emissions from power plants in 22 states, including Missouri. At the time of issuing the CSAPR Update rule, EPA was unable to conclude that the rule would fully address good-neighbor obligations under the 2008 standard for all states participating in the program. However, in October 2017, EPA released modeling results showing there would be no remaining nonattainment or maintenance receptors in the CSAPR region by 2023 relative to the 2008 ozone standard.

On December 21, 2018, EPA finalized a rule in which they determined with respect to the 2008 ozone standard that there is no need to establish additional ozone transport reduction requirements for sources in CSAPR-region states, nor is there a need for CSAPR-region states to submit SIP revisions establishing additional requirements to control ozone transport under the 2008 ozone standard beyond the CSAPR Update rule.⁵ The EPA concluded that the emission reductions from the CSAPR Update rule along with all on-the-books control measures were sufficient to address the CAA good neighbor obligations for all CSAPR region states with respect to the 2008 ozone standard.

1.2. EPA Good Neighbor Framework and SIP Guidance for the 2015 Ozone NAAQS

1.2.1. CAA 110(a)(2)(D)(i)(I) and EPA's 4-Step Process

Due to the complex nature of determining good neighbor SIP obligations for secondary pollutants like ozone, EPA has developed a four-step process to determine upwind states that contribute to problems in downwind states and the requisite level of emission control necessary for upwind states to address their CAA good neighbor provisions for these pollutants. The air program followed this four-step process in developing this SIP revision –

³ 76 FR 48208, August 8, 2011

⁴ 81 FR 74504, October 26, 2016

⁵ 83 FR 65878, December 21, 2018

1. Identify areas in the country that are projected to have trouble attaining and maintaining compliance with the relevant NAAQS;
2. Identify which upwind states are contributing to the air pollution problems in downwind states identified in step 1;
3. Identify the requisite level of emission control necessary to address the upwind state's significant contribution to the air pollution problem or interference with maintenance in the downwind states; and
4. Develop enforceable control requirements to ensure the requisite level of emission control identified in step 3.

Based on EPA's four-step process, if there are no areas identified in step 1, the exercise is complete, and a state's SIP is approvable without further control requirements. If there are areas identified in step 1, but in step 2, a particular state can demonstrate they are not significantly contributing to the problem in any downwind state, then that particular state's SIP is approvable without further control requirements. This means that states can skip steps 3 and 4 if there are no air quality problems for the applicable NAAQS in any downwind states or if the state can demonstrate that they are not significantly contributing to the air quality problems identified in any downwind state.

1.2.2. EPA 2023 Ozone Transport Modeling

On March 27, 2018, EPA released a memorandum (the EPA March memo) from Peter Tsirigotis titled *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)*. In this memo, EPA provided states with its modeling predictions for 8-hour ozone design values in 2023, along with state contributions to those ozone receptors, which the modeling predicted would violate (nonattainment) or would be in danger of violating (maintenance) the 2015 8-hour ozone NAAQS. EPA also sought state feedback on certain approaches or flexibilities that EPA was considering to allow states to utilize in developing their good neighbor SIPs.

The EPA March memo identified projected ozone design values at potential nonattainment and maintenance receptors for the year 2023. Included in these modeling results was an analysis of the modeled differences of including or not including photochemical modeling grid cells that contain 50 percent or more water when determining the modeled relative response factor for receptors located near water and their corresponding future year projected design values. The modeling results also provided each upwind state's modeled contributions to each of the projected nonattainment and maintenance receptors for the 2023 future year.

1.2.3. EPA Memo - 1 percent vs. 1 ppb Threshold and Significant Captured Percentage

On August 31, 2018, EPA released another memorandum (the EPA August memo) from Peter Tsirigotis titled *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*. EPA conducted a post-processing analysis of its

ozone transport modeling results and compared several different contribution threshold levels to determine the amount of overall upwind state contributions that various contribution thresholds would capture. The analysis in the memo concluded the difference between a 1 part per billion (ppb) threshold and a 1 percent of the 8-hour ozone NAAQS (0.7 ppb) threshold resulted in small differences in the overall contributions captured at step 2 of the good neighbor SIP framework process. Specifically, EPA states in the memo the overall capture at a contribution threshold of 0.7 ppb is 77 percent of total upwind state contribution and 70 percent for a 1 ppb threshold.

Based on their analysis, EPA concluded the use of the 1 ppb contribution threshold is appropriate for use by states in step 2 of their good neighbor SIP analyses when determining linkages to downwind state nonattainment or maintenance receptors. Missouri supports this analysis and corresponding memorandum that EPA performed and also notes that certain nonattainment and maintenance receptors capture a similarly high overall percentage of upwind state contributions at even higher contribution thresholds. This means the rationale used by EPA in this memo may support the use of even higher contribution thresholds for particular monitors where the relative contribution from neighboring upwind states to a particular receptor are far more significant than the collective contribution from more distant upwind states.

1.2.4. EPA Memo – Alternative Methods of Identifying Maintenance Monitors

On October 19, 2018, EPA released a third memorandum (the EPA October memo) from Peter Tsirigotis titled *Considerations for Identifying Maintenance Receptors 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*. In this memo, EPA provides potential alternative methods of identifying maintenance monitors to be addressed in their good neighbor SIPs for the 2015 ozone NAAQS even if the 2023 maximum modeled 8-hour ozone design value is larger than 70.9 ppb. Per the memo, with an appropriate technical demonstration, states may eliminate a site as a maintenance receptor based on currently measured clean data or use a design value from the base period that is not the maximum design value. If a state is using an alternative base period as allowed per the memo, the technical demonstration must show that the monitor in question meets certain criteria. These criteria include an analysis showing that the monitor in question would attain the 2015 ozone NAAQS using an alternative base year, an analysis showing the meteorological conditions in the alternative base period were conducive to ozone formation, a demonstration that ozone concentrations have been trending downward at the monitor since 2011, and a demonstration showing that ozone precursor emissions in the upwind and downwind states have decreased since 2011 and are expected to continue to decline out to the attainment date for the receptor.

1.3. Missouri’s Infrastructure SIP for the 2015 Ozone NAAQS

Within three years of the promulgation of any new or revised NAAQS, CAA, section 110(a)(1) requires states to submit a SIP revision to provide for the implementation, maintenance, and enforcement of the NAAQS. Such revisions are commonly referred to as “Infrastructure SIPs” (I-SIPs). In Missouri, most of these I-SIP requirements were addressed through Missouri’s I-SIP revision for the 2015 ozone NAAQS, which was adopted by the Missouri Air Conservation

Commission on March 28, 2019. However, that I-SIP revision did not address Missouri’s good neighbor SIP requirements under the 2015 ozone standard. Chapters 2 and 3 of this document provide a demonstration showing that Missouri’s SIP fully addresses its good neighbor SIP obligations with respect to the 2015 ozone standard according to EPA’s four-step framework and corresponding guidance and memorandums.

2. EPA Step 1 - Nonattainment and Maintenance Receptors

Under EPA’s framework, step 1 is to identify all nonattainment and maintenance receptors with respect to the 2015 ozone standard. The EPA March memo provided air quality modeling results for ozone in 2023, including projected ozone concentrations at potential nonattainment and maintenance receptors for the 2015 ozone NAAQS and projected upwind state contribution data. EPA selected 2023 as the analytic year for evaluating the anticipated attainment year for moderate ozone nonattainment areas. Missouri agrees with EPA’s selection of 2023 as a reasonable analytic year for evaluating ozone transport problems with respect to the 2015 ozone NAAQS, as it aligns with the last full ozone season before the attainment year for moderate ozone nonattainment areas.

According to EPA’s four-step framework, a site is classified as a nonattainment receptor if the average modeled design value (DV) in 2023 exceeds 70.9 ppb. Maintenance receptors are those sites with maximum-modeled DVs in 2023 exceeding 70.9 ppb. Table 1 provides a list of all nonattainment and maintenance receptors identified in the EPA March memo. The table also includes the 2023 average and maximum DVs along with the average and maximum actual DVs from 2009-2013 for the convenience of comparison. The units for all DVs listed in Table 1 are parts per billion (ppb).

Table 1. List of Nonattainment and Maintenance Receptors Based on EPA's Modeling Results

| Site | State | County | 2009-2013 Avg DV | 2009-2013 Max DV | 2023 Avg DV | 2023 Max DV |
|----------|------------|----------|------------------|------------------|-------------|-------------|
| 40130019 | Arizona | Maricopa | 76.7 | 79 | 69.3 | 71.4 |
| 40131004 | Arizona | Maricopa | 79.7 | 81 | 69.8 | 71.0 |
| 60190007 | California | Fresno | 94.7 | 95 | 79.2 | 79.4 |
| 60190011 | California | Fresno | 93.0 | 96 | 78.6 | 81.2 |
| 60190242 | California | Fresno | 91.7 | 95 | 79.4 | 82.2 |
| 60194001 | California | Fresno | 90.7 | 92 | 73.3 | 74.4 |
| 60195001 | California | Fresno | 97.0 | 99 | 79.6 | 81.2 |
| 60250005 | California | Imperial | 74.7 | 76 | 73.3 | 74.6 |
| 60251003 | California | Imperial | 81.0 | 82 | 79.0 | 80.0 |
| 60290007 | California | Kern | 91.7 | 96 | 77.7 | 81.3 |
| 60290008 | California | Kern | 86.3 | 88 | 71.3 | 72.8 |
| 60290014 | California | Kern | 87.7 | 89 | 74.1 | 75.2 |
| 60290232 | California | Kern | 87.3 | 89 | 73.7 | 75.2 |

| Site | State | County | 2009-2013 Avg DV | 2009-2013 Max DV | 2023 Avg DV | 2023 Max DV |
|----------|------------|----------------|------------------|------------------|-------------|-------------|
| 60295002 | California | Kern | 90.0 | 91 | 75.9 | 76.8 |
| 60296001 | California | Kern | 84.3 | 86 | 70.9 | 72.4 |
| 60370002 | California | Los Angeles | 80.0 | 82 | 73.3 | 75.1 |
| 60370016 | California | Los Angeles | 94.0 | 97 | 86.1 | 88.9 |
| 60371201 | California | Los Angeles | 90.0 | 90 | 79.8 | 79.8 |
| 60371701 | California | Los Angeles | 84.0 | 85 | 78.1 | 79.1 |
| 60372005 | California | Los Angeles | 79.5 | 82 | 72.3 | 74.6 |
| 60376012 | California | Los Angeles | 97.3 | 99 | 85.9 | 87.4 |
| 60379033 | California | Los Angeles | 90.0 | 91 | 76.3 | 77.2 |
| 60392010 | California | Madera | 85.0 | 86 | 72.1 | 72.9 |
| 60470003 | California | Merced | 82.7 | 84 | 69.9 | 71.0 |
| 60650004 | California | Riverside | 85.0 | 85 | 76.7 | 76.7 |
| 60650012 | California | Riverside | 97.3 | 99 | 83.6 | 85.1 |
| 60651016 | California | Riverside | 100.7 | 101 | 85.2 | 85.5 |
| 60652002 | California | Riverside | 84.3 | 85 | 72.4 | 73.0 |
| 60655001 | California | Riverside | 92.3 | 93 | 79.5 | 80.1 |
| 60656001 | California | Riverside | 94.0 | 98 | 78.3 | 81.6 |
| 60658001 | California | Riverside | 97.0 | 98 | 87.0 | 87.9 |
| 60658005 | California | Riverside | 92.7 | 94 | 83.2 | 84.4 |
| 60659001 | California | Riverside | 88.3 | 91 | 73.7 | 75.9 |
| 60670012 | California | Sacramento | 93.3 | 95 | 74.5 | 75.9 |
| 60675003 | California | Sacramento | 86.3 | 88 | 69.9 | 71.3 |
| 60710005 | California | San Bernardino | 105.0 | 107 | 96.2 | 98.1 |
| 60710012 | California | San Bernardino | 95.0 | 97 | 84.1 | 85.8 |
| 60710306 | California | San Bernardino | 83.7 | 85 | 76.2 | 77.4 |
| 60711004 | California | San Bernardino | 96.7 | 98 | 89.8 | 91.0 |
| 60712002 | California | San Bernardino | 101.0 | 103 | 93.1 | 95.0 |
| 60714001 | California | San Bernardino | 94.3 | 97 | 86.0 | 88.5 |
| 60714003 | California | San Bernardino | 105.0 | 107 | 94.1 | 95.8 |
| 60719002 | California | San Bernardino | 92.3 | 94 | 80.0 | 81.4 |
| 60719004 | California | San Bernardino | 98.7 | 99 | 88.4 | 88.7 |
| 60990006 | California | Stanislaus | 87.0 | 88 | 74.8 | 75.7 |
| 61070006 | California | Tulare | 81.7 | 85 | 69.1 | 71.9 |
| 61070009 | California | Tulare | 94.7 | 96 | 76.1 | 77.2 |
| 61072002 | California | Tulare | 85.0 | 88 | 68.9 | 71.4 |
| 61072010 | California | Tulare | 89.0 | 90 | 73.1 | 73.9 |
| 61112002 | California | Ventura | 81.0 | 83 | 70.5 | 72.2 |
| 80050002 | Colorado | Arapahoe | 76.7 | 79 | 69.3 | 71.3 |
| 80350004 | Colorado | Douglas | 80.7 | 83 | 71.1 | 73.2 |

| Site | State | County | 2009-2013 Avg DV | 2009-2013 Max DV | 2023 Avg DV | 2023 Max DV |
|-----------|-------------|-----------|------------------|------------------|-------------|-------------|
| 80590006 | Colorado | Jefferson | 80.3 | 83 | 71.3 | 73.7 |
| 80590011 | Colorado | Jefferson | 78.7 | 82 | 70.9 | 73.9 |
| 80690011 | Colorado | Larimer | 78.0 | 80 | 71.2 | 73.0 |
| 81230009 | Colorado | Weld | 74.7 | 76 | 70.2 | 71.4 |
| 90010017 | Connecticut | Fairfield | 80.3 | 83 | 68.9 | 71.2 |
| 90013007 | Connecticut | Fairfield | 84.3 | 89 | 71.0 | 75.0 |
| 90019003 | Connecticut | Fairfield | 83.7 | 87 | 73.0 | 75.9 |
| 90099002 | Connecticut | New Haven | 85.7 | 89 | 69.9 | 72.6 |
| 240251001 | Maryland | Harford | 90.0 | 93 | 70.9 | 73.3 |
| 260050003 | Michigan | Allegan | 82.7 | 86 | 69.0 | 71.7 |
| 261630019 | Michigan | Wayne | 78.7 | 81 | 69.0 | 71.0 |
| 360810124 | New York | Queens | 78.0 | 80 | 70.2 | 72.0 |
| 361030002 | New York | Suffolk | 83.3 | 85 | 74.0 | 75.5 |
| 480391004 | Texas | Brazoria | 88.0 | 89 | 74.0 | 74.9 |
| 481210034 | Texas | Denton | 84.3 | 87 | 69.7 | 72.0 |
| 482010024 | Texas | Harris | 80.3 | 83 | 70.4 | 72.8 |
| 482011034 | Texas | Harris | 81.0 | 82 | 70.8 | 71.6 |
| 482011039 | Texas | Harris | 82.0 | 84 | 71.8 | 73.5 |
| 484392003 | Texas | Tarrant | 87.3 | 90 | 72.5 | 74.8 |
| 550790085 | Wisconsin | Milwaukee | 80.0 | 82 | 71.2 | 73.0 |
| 551170006 | Wisconsin | Sheboygan | 84.3 | 87 | 72.8 | 75.1 |

3. EPA Step 2- Missouri Linkage to Nonattainment and Maintenance Receptors

Under EPA’s framework, step 2 is to determine upwind states that are expected to contribute to downwind state nonattainment and maintenance receptors. EPA’s modeling from the EPA March memo included source apportionment modeling results that provided the contribution from all anthropogenic emissions in each state to each receptor included in the analysis. In previous ozone transport analyses, EPA used a contribution threshold of one percent of the level of the NAAQS. This means EPA considered an upwind state linked to a downwind state air pollution problem if the modeling showed an upwind state’s anthropogenic emissions in the future year would contribute to ozone pollution at a downwind state nonattainment or maintenance receptor in excess of one percent of the level of the NAAQS.

In Missouri’s analysis, the air program started by determining all of the nonattainment and maintenance receptors to which Missouri is projected to contribute more than one percent of the level of the 2015 ozone NAAQS (0.7 ppb). These receptors, along with their 2009-2013 and 2023 average and maximum DVs, and Missouri’s projected contribution to the future year DVs

are listed in Table 2. The sites highlighted in orange represent nonattainment receptors, where Missouri’s projected contribution to the 2023 DV is greater than 0.7 ppb. The two sites in Michigan are maintenance receptors, which the EPA modeling projects Missouri’s contribution to the 2023 ozone DVs will be greater than 0.7 ppb. The 2015-2017 DVs are also included to show the improvement in ozone concentrations at each of these monitors over the past several years. As seen in the table, current (2015-2017) ozone DVs for each of these monitors are between 4 ppb and 15 ppb lower than the average weighted DVs from 2009-2013. As shown in the table, the distance between the border of Missouri and the monitor sites identified in the table range from 270 miles to 480 miles. This significant distance between the identified sites and the border of Missouri is important when considering the impact of local or neighboring state emissions compared with emission contributions from more distant upwind states.

Table 2. Downwind Receptors with Missouri Contributions Larger than 0.7 ppb

| Site ID | State | County | Distance to Missouri Border (miles)* | 2009-2013 Avg. (ppb) | 2009-2013 Max (ppb) | 2023 “3×3” Avg. (ppb) | 2023 “3×3” Max (ppb) | RRF ⁶ | Missouri Cont. (ppb) | 2015-2017 DV (ppb) |
|-----------|-----------|-----------|--------------------------------------|----------------------|---------------------|-----------------------|----------------------|------------------|----------------------|--------------------|
| 260050003 | Michigan | Allegan | 320 | 82.7 | 86 | 69.0 | 71.7 | 0.834 | 2.61 | 73 |
| 261630019 | Michigan | Wayne | 450 | 78.7 | 81 | 69.0 | 71.0 | 0.877 | 0.92 | 72 |
| 480391004 | Texas | Brazoria | 480 | 88.0 | 89 | 74.0 | 74.9 | 0.841 | 0.88 | 75 |
| 482011039 | Texas | Harris | 470 | 82.0 | 84 | 71.8 | 73.5 | 0.876 | 0.88 | 67 |
| 550790085 | Wisconsin | Milwaukee | 270 | 80.0 | 82 | 71.2 | 73.0 | 0.890 | 0.93 | 71 |
| 551170006 | Wisconsin | Sheboygan | 300 | 84.3 | 87 | 72.8 | 75.1 | 0.864 | 1.37 | 80 |

*Rounded to the nearest 10 miles

Missouri has reviewed EPA’s guidance and memos relating to good neighbor SIPs under the 2015 ozone NAAQS. Based on these guidance and memos, Missouri has developed a weight of evidence analysis for each of these sites to determine the level of Missouri’s contribution and how it relates to contribution from other upwind states and other relevant factors. The following sections of this document provide this weight of evidence analysis for each of the sites listed in Table 2.

3.1. Texas Sites

There are two nonattainment receptors in Texas showing Missouri contributions to their 2023 ozone DVs above 0.7 ppb. EPA’s modeling results show that Missouri’s projected contribution is 0.88 ppb to both receptors in Brazoria County (Brazoria, Site ID: 480391004) and Harris County (Harris, Site ID: 482011039), which is over one percent of the 2015 ozone standard. These two sites are located more 450 miles away from Missouri’s border.

Further analysis of the EPA March memo modeling results shows that total upwind state contribution is only approximately 13 ppb to both of these Texas receptors. Texas’ in-state contribution to these two receptors is 26 ppb to Brazoria and 22.6 ppb to Harris. If you combine the initial boundary conditions and the contribution from biogenic emissions, the contribution

⁶ Relative Response Factor = Avg. (2023)/Avg. (2009-2013)

from these two categories is over 52 ppb, for these two receptors. Based on this, the ozone problems at these two receptors are not caused by upwind U.S. state anthropogenic emissions. Instead, in-state contributions, natural ozone concentrations, and international emissions are the likely significant contributors to the problem at these two sites.

Further, according to the EPA August memo, EPA plans to generally afford states the flexibility of using 1 ppb as the contribution threshold in step 2 of their framework because this alternative contribution threshold generally captures a substantial amount of transported contribution from upwind states to the downwind monitors. Missouri's contribution to these two sites' 2023 projected ozone DVs is 0.88 ppb, which is below this alternative 1 ppb contribution threshold from the EPA August memo. Based on all of these factors, Missouri will not contribute significantly to these nonattainment receptors in 2023. Therefore, Missouri's SIP is sufficiently addressing the good neighbor obligation for the 2015 ozone NAAQS with respect to these two receptors based on this step 2 weight of evidence analysis.

3.2. Milwaukee, Wisconsin Site

From Table 2, Missouri has a projected contribution of 0.93 ppb to the 2023 ozone DV at one of the Milwaukee, Wisconsin receptors (Milwaukee, Site ID: 550790085). This site is located approximately 270 miles away from Missouri's border. This site is a modeled nonattainment receptor in 2023. Missouri's projected contribution to this receptor's 2023 DV is above 0.7 ppb, but below the alternative threshold contribution level of 1 ppb from the EPA August memo. According to EPA's contribution threshold analysis in the EPA August memo, the 0.7 ppb threshold for this receptor captures 86.6 percent of the total contribution from all upwind states and the one ppb threshold captures 79.4 percent of the total contribution from all upwind states. Further, the contribution captured by the 1 ppb threshold is 83 percent of the amount captured by the 0.7 ppb threshold. This provides confidence that the 1 ppb threshold will capture a substantial amount of total upwind states' contribution to ozone concentrations at this site, which will lead to meaningful emission reductions that will help ensure the site will attain the NAAQS in 2023. Therefore, Missouri's SIP is sufficiently addressing the good neighbor obligation for the 2015 ozone NAAQS with respect to this receptor based on this step 2 weight of evidence analysis.

3.3. Wayne, Michigan Site

Similar to the analysis provided above in section 3.2, EPA's updated modeling results show Missouri has a projected contribution of 0.92 ppb to the 2023 ozone DV at the Wayne, Michigan receptor (Wayne, Site ID: 261630019). This site is located approximately 450 miles away from Missouri's border. According to the modeling results, this site represents a maintenance receptor in 2023. Missouri's projected contribution to this receptor's 2023 DV is above 0.7 ppb, but below the alternative threshold contribution level of 1 ppb from the EPA August memo. EPA's contribution threshold analysis from the EPA August memo shows that a 0.7 ppb threshold would capture 67 percent of total upwind state contributions and the 1 ppb threshold would capture 61.8 percent of total upwind state contributions. In this case, the contribution captured by the 1 ppb threshold occupies 92.2 percent of the total contribution captured by the 0.7 ppb threshold. This provides confidence that the 1 ppb threshold will capture a substantial amount of upwind states' contribution to the ozone concentrations at this site, which will lead to meaningful

emission reductions that will help ensure the site will attain the NAAQS in 2023. Therefore, Missouri's SIP is sufficiently addressing the good neighbor obligation for the 2015 ozone NAAQS with respect to this receptor based on this step 2 weight of evidence analysis.

3.4. Sheboygan County, Wisconsin Site

According to the EPA's modeling results, the site in Sheboygan, Wisconsin (Sheboygan, Site ID: 551170006) is a nonattainment receptor. This site is located approximately 300 miles away from Missouri's border. EPA's modeling indicates that Missouri's projected contribution to the 2023 ozone DV at this receptor is 1.37 ppb. This projected contribution is above the 1 percent of the NAAQS threshold (0.7 ppb) and the alternative 1 ppb threshold identified in the EPA August memo. However, further analysis of this particular receptor reveals the rationale behind EPA's threshold analysis in the EPA August memo may apply to a higher threshold for this particular monitor. According to the EPA August memo, a 1 ppb threshold would capture approximately 70 percent of total upwind state contributions to nonattainment and maintenance receptors based on the national average, and a 2 ppb threshold would only capture 51 percent of the total upwind state contribution on average. However, this is not the case for this Sheboygan receptor where a 1 ppb threshold would capture 79.4 percent of the total upwind contributions and a 2 ppb threshold would capture 68.2 percent of the total upwind state contributions. The 2 ppb threshold at this receptor would capture 85.9 percent of the upwind state contributions captured under a 1 ppb threshold. Based on the logic and rationale in the EPA August memo, this provides confidence that for this particular site, a 2 ppb threshold is appropriate at step 2 as it will still capture nearly 70 percent of the total upwind state contributions and result in meaningful emission reductions that will help the site attain by 2023.

For this particular site, which is located in the shoreline of Lake Michigan, the primary contributors to the ozone concentrations include the Chicago metropolitan area in Illinois and Northwest Indiana, and the Milwaukee, Wisconsin combined statistical area. These three states' total contribution to the 2023 ozone DV at the Sheboygan receptor is 31.93 ppb with 15.73 ppb from IL, 9.09 ppb from WI, and 7.11 ppb from IN. The Lake Michigan Air Director's Consortium's (LADCO's) interstate transport modeling results for the 2015 ozone NAAQS⁷ also show that the ozone levels at the Wisconsin shoreline of Lake Michigan are heavily affected by the emissions from Illinois, Indiana, and Wisconsin. The areas in closer proximity to the Lake shoreline display the most frequent and most elevated ozone concentrations.⁸ The other site (551170009) in Sheboygan County, which is a few miles more inland than the nonattainment receptor evaluated in this analysis, has no projected problems with attaining and maintaining compliance with the 2015 ozone NAAQS. This provides evidence that the nonattainment receptor in Sheboygan is also heavily influenced by local transport emissions and lake breeze effects over Lake Michigan.

Based on this weight of evidence analysis, a 2 ppb threshold is appropriate and follows the rationale included in the EPA August memo. This threshold will capture the significant

⁷ See Interstate Transport Modeling for the 2015 Ozone National Ambient Air Quality Standard, the technical support document (TSD), https://www.ladco.org/wp-content/uploads/Documents/Reports/TSDs/O3/LADCO_2015O3iSIP_TSD_13Aug2018.pdf

⁸ Attainment Plan for Sheboygan County, WI NAA for 2008 Ozone NAAQS

contributors to the ozone problem experienced at this site and lead to upwind state emission reductions that will provide meaningful improvement in the ozone concentrations recorded by the site. For all of these reasons, Missouri’s SIP is sufficiently addressing the good neighbor obligation for the 2015 ozone NAAQS with respect to this receptor based on this step 2 weight of evidence analysis.

3.5. Allegan County, Michigan Site

The modeling data provided by EPA for the site in Allegan County, Michigan (Allegan, Site ID 260050003) is listed in Table 3. All units are in ppb. This site is located approximately 320 miles away from Missouri’s border.

Table 3. Summary of EPA Modeling Results on Allegan, Michigan

| Site ID, County, State | 2023en Average | 2023en Maximum | Total Upwind State Contribution | Missouri Contribution | Canada & Mexico Contribution | Initial & Boundary |
|------------------------|----------------|----------------|---------------------------------|-----------------------|------------------------------|--------------------|
| 260050003, Allegan, MI | 69.0 | 71.7 | 42.90 | 2.61 | 0.54 | 11.85 |

The 2023 average DV for the Allegan receptor is below 71 ppb, which means this site is assumed to demonstrate attainment by 2023. However, the maximum modeled design value in 2023 is 0.7 ppb above 71 ppb. Because the projected maximum 2023 ozone design value is above 71 ppb, the site is initially classified as a maintenance receptor with respect to the 2015 ozone NAAQS according to EPA’s 4-step approach. However, subsection 3.5.1. discusses how this monitor meets the criteria for an alternative approach of identifying maintenance receptors in step 1 of EPA’s framework, which would eliminate this site as a maintenance receptor according to the EPA October memo.

3.5.1. Allegan Site Meets the Criteria in the EPA October Memo to Justify Exclusion as a Maintenance Receptor

As discussed in subsection 1.2.4. of this document, the EPA October Memo affords states in developing their good neighbor SIPs an alternative option for identifying maintenance receptors that states must address in their plans. If the alternative approach shows that a maintenance receptor identified using a previous method would not be a maintenance receptor under the alternative method, this flexibility would allow states to exclude that site from further analysis in step 1 of EPA’s framework. The memo states that EPA plans to allow this flexibility if the site in question would attain the 2015 ozone NAAQS using an alternative base period and also meets the following three conditions:

1. Meteorological conditions in the area of the monitoring site were conducive to ozone formation during the alternative base period design value used for projections;
2. Ozone concentrations have been trending downward at the site since 2011 (and ozone precursor emissions of NO_x and VOCs have also decreased); and

3. Emissions are expected to continue to decline in the upwind and downwind states out to the attainment date of the site.

According to EPA’s modeling projections, the Allegan receptor would indeed attain the 2015 ozone NAAQS by 2023 if an alternative base period was selected. In EPA’s modeling they included a 5-year base period (2009-2013) for determining the average and maximum ozone DVs to which they applied the modeled relative response factor to calculate the projected DV in 2023. The 3-year base period of 2009-2011 falls fully within the 2009-2013 base period. As shown in Table 4, if the base period selected is 2009-2011, the receptor demonstrates attainment by 2023 with a projected 2023 DV of 66.9 ppb.

Table 4. Allegan County Ozone Design Value from 2009 – 2011 and Corresponding 2023 Design Value

| | 2009-2011 |
|---------------------------------|------------------|
| Base Period DV (ppb) | 78 |
| Relative Response Factor | 0.858 |
| 2023 Projected DV (ppb) | 66.9 |

Using the alternative base period of 2009-2011, the Allegan site meets the first requirement for further consideration according to the EPA October memo. The next step according to the EPA October memo is to determine if the Allegan site also meets the other three criteria provided in the memo. Parts 3.5.1.1 – 3.5.1.3 below, discuss how the other three criteria from the EPA October memo relate to the Allegan site.

3.5.1.1 Alternative Base Period Meteorology was Conducive to Ozone Formation

The first criteria listed in EPA’s October memo, is that the meteorological conditions during the alternative base period were conducive to ozone formation. The EPA October memo provided the summer average temperature data across the entire country for many years since 2009. Figure 1, below, shows the summer average temperature rankings for each state during the years 2009-2011. As seen in the figure, the average summer temperatures in Michigan during the years 2010 and 2011 were well above historic average temperatures, meaning the meteorology during those years was clearly conducive to ozone formation. The summer of 2010 was the 8th warmest in 116 years in Michigan, and the summer of 2011 in Michigan was the 18th warmest in 117 years. However, the average summer temperature in Michigan during 2009 was well below average, meaning that year’s meteorological conditions may not have been particularly conducive to ozone formation when looking at average summer temperature data alone. Therefore, the air program has gathered additional meteorological information regarding the Michigan summer of 2009.

Daily temperatures, precipitation, and wind speed can all affect ground-level ozone concentrations. In general, warm dry weather is more conducive to ozone formation than cool wet weather. Wind speed can affect both the location and concentration of ozone pollution. Higher wind speeds in an area are less conducive to high ozone concentrations than low speeds

because higher wind speeds tend to disperse ozone concentrations before they build up to higher levels that cause exceedances. A review of 2009 National Weather Service data from May through September (the high ozone season) from the West Michigan Regional Airport (KBIV) provides the following observations:

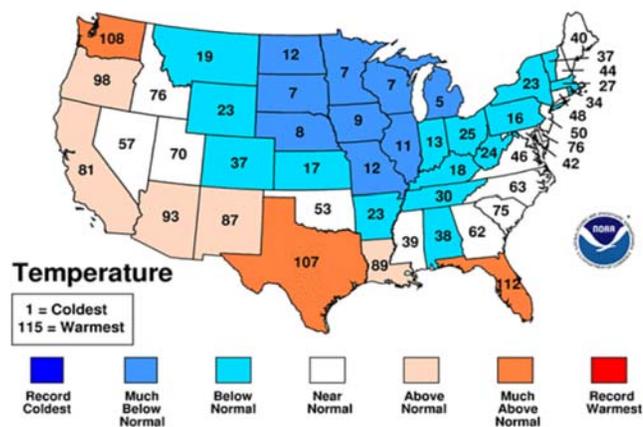
- There were 45 days where the high temperature reached 80 degrees Fahrenheit or greater;
- There were 97 days with no precipitation;
- There were 65 days where the average wind speed was 5 miles per hour or less; and
- There were 25 days during these months where all three of the above listed criteria for temperature, wind speed, and precipitation were met.

These observations show that although the summer of 2009 in Michigan was the fifth coolest summer on average for the entire summer, there was still a large number of days during the high ozone season where the meteorology was conducive to ozone formation. Therefore, when looking at the 3-year alternative base period from 2009-2011, two of the three years (2010 and 2011) were highly conducive to ozone formation and ozone conducive meteorology was also present during a large number of days from May through September in 2009. Based on these analyses, the 2009-2011 alternative base period for the Allegan, Michigan monitor meets the first criteria of the EPA October memo.

Figure 1. National Temperature Rankings from 2009 through 2011

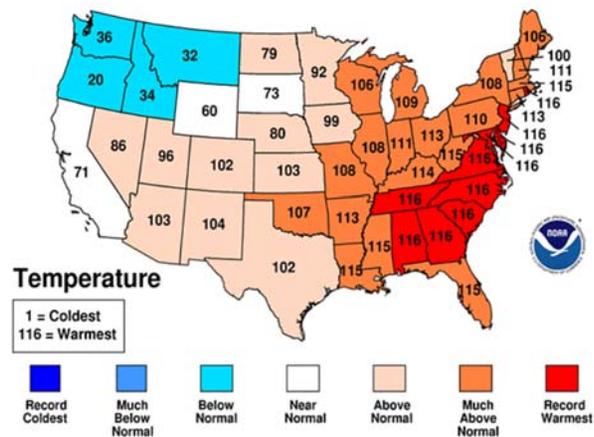
June-August 2009 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



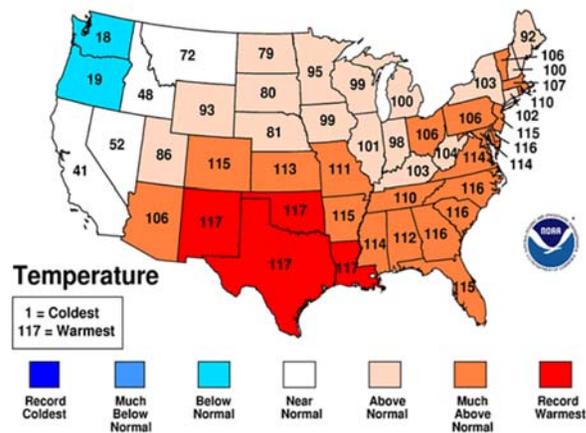
June-August 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



June-August 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



In order to further support the conclusion that an alternative base period, which would demonstrate attainment by 2023, for the Allegan site was conducive to ozone formation, the air program has performed two additional analyses. The first analysis ignores the use of 2009, due to the relatively low average summer temperatures in Michigan that year. If one were to compute an alternative 2-year base period design value for this monitor, using only the fourth highest 8-hour ozone concentrations recorded in 2010 and 2011, this 2-year design value would equal 79 ppb. Then applying EPA's modeled relative response factor for this receptor (0.858) to this alternative 2-year base period design value, would yield a 2023 projected design value of 67.8 ppb, which also demonstrates attainment of the 2015 ozone standard. Therefore, even if the summer of 2009 was ignored when computing the alternative base period design value and only the summers of 2010 and 2011 were used, this receptor would still demonstrate attainment of the 2015 ozone standard by 2023.

The second analysis evaluates an alternative 4-year base period from 2009-2012. The summer of 2012 was among the most ozone conducive summers across the entire Midwestern portion of the country in the last two decades. An historic drought plagued nearly the entire Midwest. During that summer, monitors all across the Midwest including Missouri and Michigan recorded ozone concentrations among the highest in the past decade and the number of ozone exceedances was far higher than any recent year. The Allegan monitor recorded 36 exceedances of the 2015 ozone standard that summer compared to an average of six or seven exceedances in all other years from 2010-2017. Clearly, the summer of 2012 was an extreme outlier in favor of ozone-conducive meteorology. Therefore, using an alternative 4-year base period, which includes the summer of 2012, this balances out any potentially favorable meteorology from the summer of 2009. Then with the inclusion of the summers of 2010 and 2011, which were both highly ozone conducive, this clearly tilts the balance towards ozone conducive meteorology for the alternative base period. If one were to compute an alternative 4-year base period design value for this monitor using the fourth highest 8-hour ozone concentrations recorded in 2009, 2010, 2011, and 2012, it would equal 82 ppb. Then applying EPA's modeled relative response factor for this receptor (0.858) to this alternative 4-year base period design value, would yield a 2023 projected design value of 70.4 ppb, which is below 71 ppb. Therefore, it would also demonstrate attainment with the 2015 ozone standard. Based on all three analyses and observations, the Allegan, Michigan site meets the first criteria of the EPA October memo (ozone conducive meteorology during the alternative base period).

3.5.1.2 Ozone Concentrations at the Allegan Monitor Have Been Trending Downward Since 2011

The second criteria listed in the EPA October memo requires states to show that ozone concentrations at the site in question have been trending downward since 2011, and that ozone precursor emissions in the upwind and downwind states have also been decreasing since that time. Figure 2, below, includes the ozone design values for the Allegan monitor starting with the three-year period of 2009-2011 and going through 2015-2017. While the ozone design values at the monitor have fluctuated some, the overall trend (indicated by the dotted blue-line in the figure) shows a clear negative slope, meaning ozone design values have been trending downward at this monitor through 2017 (the latest year of available certified monitoring data).

Figure 3 includes the 4th high daily 8-hour average ozone concentration each year at this monitor from 2011 through 2017. Again, while the 4th high daily 8-hour ozone concentrations fluctuate from year to year, the trend is clearly downward, meaning ozone concentrations at this monitor are improving. If future ozone concentrations follow this recent trend line, the monitor will achieve compliance with the 2015 ozone standard in the near future years. Based on these trends in ozone concentration reductions over the last seven years, the Allegan monitor is on pace to attain the 2015 ozone standard by 2023.

Figure 2. Ozone Design Value Trends for Allegan, MI in Years

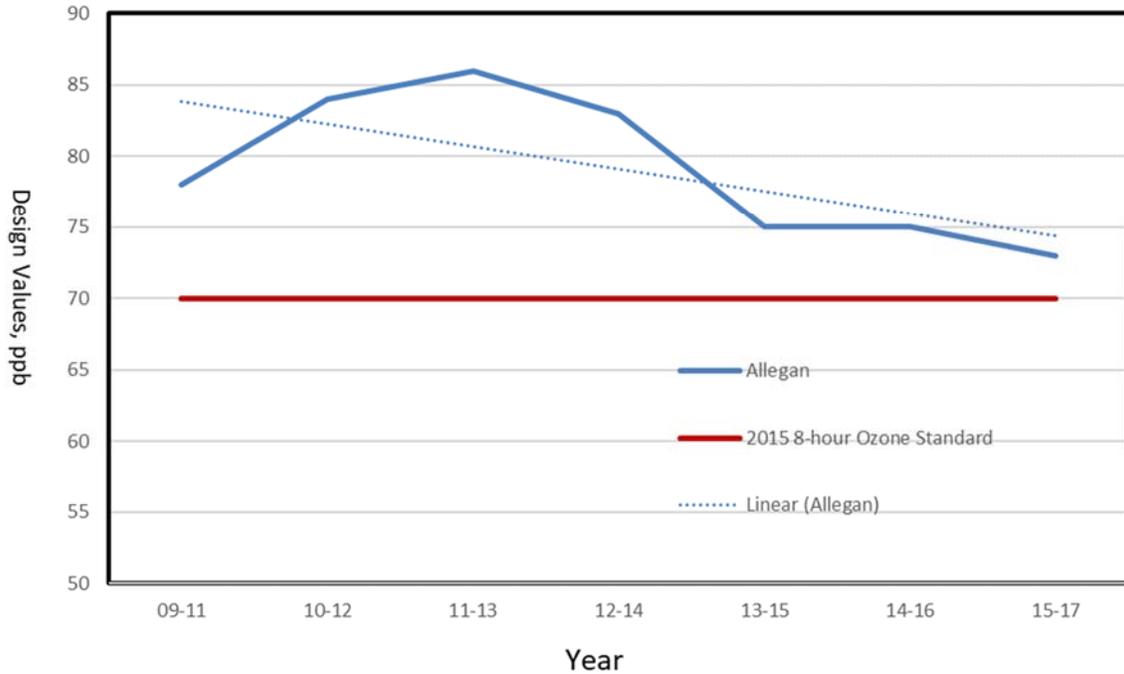
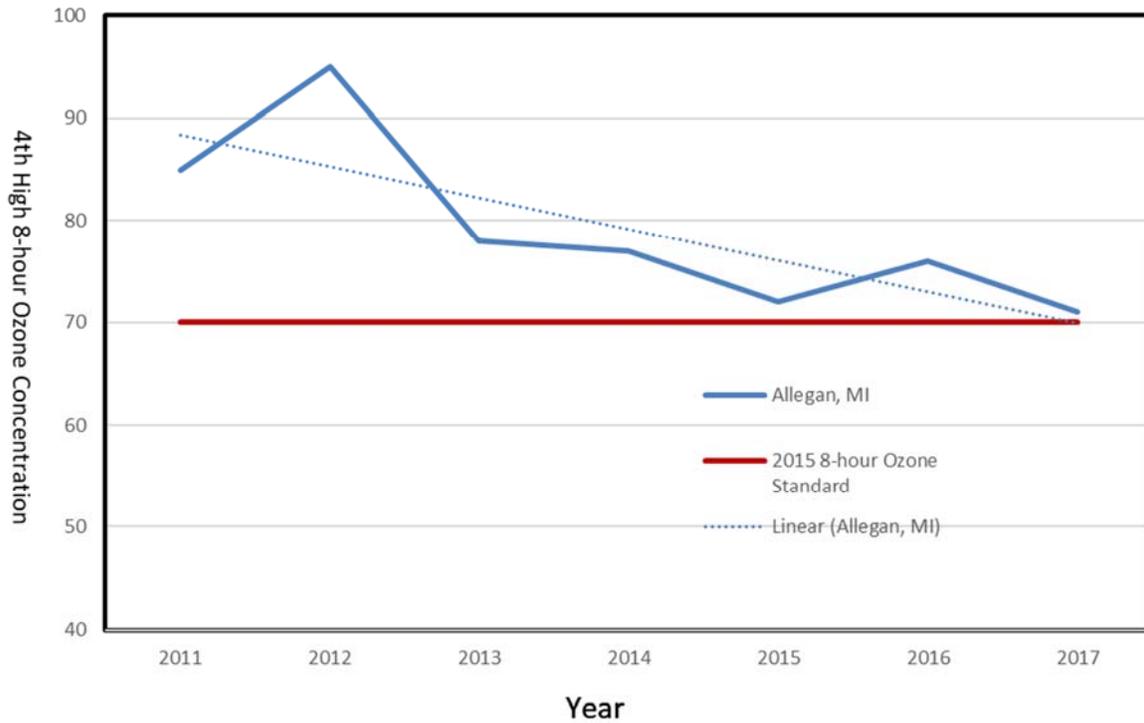


Figure 3. Ozone 4th High Concentration Trends for Allegan, MI in Years



This second criteria of the EPA October memo, requires that in addition to a downward trend in ozone concentrations since 2011, precursor emissions in both the upwind and downwind states must have also been trending downward during that timeframe. This requirement from the memo ensures that the ozone concentration reductions are not due to favorable meteorology, but rather true emission reductions leading to the improved air quality levels. Table 4, below, provides the total statewide anthropogenic NO_x and VOC emissions in Michigan, Missouri, and two neighboring upwind states from the Allegan monitor during 2011 and 2017. As seen in the table, ozone precursor emissions in all four of these states have reduced during this time period. Based on this analysis, the Allegan monitor meets the second criteria of the EPA October memo.

Table 4. Summary of Statewide Anthropogenic NO_x and VOC Emissions

| State | NO _x | | VOC | |
|----------|-----------------|---------|---------|---------|
| | 2011 | 2017 | 2011 | 2017 |
| Michigan | 443,936 | 296,009 | 450,276 | 350,937 |
| Missouri | 376,256 | 237,246 | 377,268 | 331,054 |
| Indiana | 444,421 | 317,558 | 284,378 | 226,734 |
| Illinois | 506,607 | 354,086 | 372,137 | 320,543 |

3.5.1.3 *Emissions are expected to continue to decline in the upwind and downwind states*

The third and final criteria listed in the EPA October memo requires that ozone precursor emissions in both the upwind and downwind states will continue to decline based on engineering growth projections and on-the-books control measures.

Based on the EPA’s modeling platform used to develop the 2023 future year ozone design values, Missouri’s statewide NO_x and VOC emissions are projected to decline 18.7 percent and 7.1 percent for NO_x and VOC, respectively from 2017 to 2023. This means Missouri’s ozone precursor emissions are projected to continue their downward trend through 2023, and Missouri meets the third criteria listed in the EPA October memo.

Table 5 below provides the 2017 and the projected 2023 NO_x and VOC emissions in Michigan, Missouri, and two neighboring upwind states from the Allegan monitor. As seen in the table, all of these states are showing projected emission reductions in NO_x and VOC emissions between now and 2023. Therefore, the Allegan monitor meets the third criteria listed in the EPA October memo. According to the memo, this means Missouri need not consider the Allegan site a maintenance receptor under step 1 of EPA’s framework.

Table 5. Comparison of Statewide Anthropogenic NO_x and VOC Emissions in 2017 and Projected in 2023

| State | NO _x | | VOC | |
|----------|-----------------|---------|---------|---------|
| | 2017 | 2023 | 2017 | 2023 |
| Michigan | 296,009 | 228,242 | 350,937 | 301,599 |
| Missouri | 237,246 | 192,990 | 331,054 | 307,386 |
| Indian | 317,558 | 243,954 | 226,734 | 200,827 |
| Illinois | 354,086 | 293,450 | 320,543 | 294,087 |

3.5.2. Step 1 Conclusion for the Allegan Site

As discussed in the beginning of this section, EPA’s modeling results project the Allegan site as a maintenance receptor in 2023. However, as discussed in subsection 3.5.1., the Allegan site meets all the criteria listed in the EPA October memo relating to alternative methods for identifying maintenance receptors. Specifically, the receptor would attain by 2023 using an alternative base period; the meteorological conditions during this alternative base period were conducive to ozone formation; ozone concentrations at the site have been trending downward since the 2011 base year; ozone precursor emissions in Michigan and the upwind states have been trending downward since the 2011 base year; and ozone precursor emissions in Michigan and the upwind states, including Missouri, are projected to continue declining through 2023 based on engineering growth projections and on-the-books control measures. Based on this analysis and demonstration, Missouri’s SIP is fully addressing the CAA good neighbor obligation with respect to the Allegan site.

4. Public Participation

In accordance with Section 110(a)(2) of the CAA, the Missouri Air Conservation Commission (MACC) held a public hearing prior to adoption of this SIP revision and the subsequent submittal to EPA. The air program notified the public and other interested parties of the public hearing and comment period at least thirty days prior to the public hearing for this SIP revision. Specifically –

- Notice of availability of the proposed SIP revision and announcement of the public hearing was posted on the air program website by February 25, 2019.
- The MACC held a public hearing to receive comments for the proposed SIP revision on March 28, 2019 beginning at 9:00 am at 1730 E. Elm St. - lower level Bennett Spring conference rooms.
- The air program opened a public comment period after posting the SIP revision on the air program's website on February 25, 2019. The public comment period closed on April 4, 2019, seven (7) days after the public hearing.

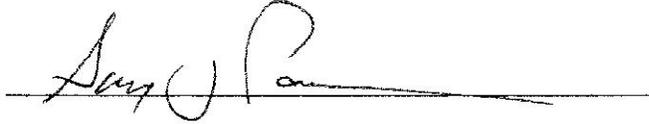
Conclusion

Missouri has numerous control measures in place to address ozone precursor emissions within the state, just like many other states around the country. These measures have resulted in significant improvement in ground-level ozone concentrations both within Missouri and in other upwind and downwind states across the country. Missouri's emissions of NO_x and VOC continue to decline, and modeling projections show further emission reductions from Missouri in the future. These reductions are the result of on-the-books state and federal control measures, and demonstrate Missouri's commitment to improving air quality not just within the state, but also in areas downwind from Missouri that are struggling to attain and maintain compliance with the 2015 ozone NAAQS.

Based on the analyses included in this document, Missouri's SIP is adequately addressing the state's obligation under CAA Section 110(a)(2)(D)(i)(I) (the good neighbor provision) with respect to the 2015 ozone NAAQS. The air program's analyses focused on all potential downwind areas where Missouri's emissions may impact ozone concentrations and adequately demonstrates Missouri's SIP ensures that emissions in Missouri will not significantly contribute to nonattainment or interfere with maintenance of the 2015 ozone NAAQS in any downwind state.

The Missouri Air Conservation Commission **ADOPTS** the following action on this 30th day of May 2019:

Missouri State Implementation Plan Revision – Interstate Transport Provisions for the 2015 Ozone Standard

 _____, Chairman

 _____, Vice Chairman

 _____, Member

_____, Member

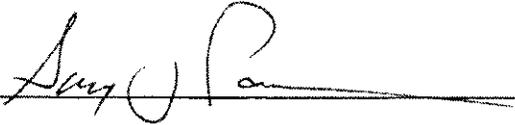
_____, Member

_____, Member

_____, Member

The Missouri Air Conservation Commission **ADOPTS** the following action
on this 30th day of May 2019:

Missouri State Implementation Plan Revision – Interstate Transport
Provisions for the 2015 Ozone Standard

 _____, Chairman

_____, Vice Chairman

 _____, Member

 _____, Member

_____, Member

_____, Member

_____, Member

Morgan, Cheri

From: Missouri DNR <MODNR@public.govdelivery.com>
Sent: Wednesday, February 27, 2019 12:57 PM
To: Bungart, Renee; Wilbur, Emily; brian.quinn@dnr.m.gov; Beydler, Van; Moore, Kyra; Gilmore, David; Maliro, Patricia; Schmidt, Connie; Downs, Jerry; Wieberg, Alicia; Hall, Stephen; Alexander, Jennifer; Patterson, Connie; Lisa.Nahach@dnr.mo.gov; Payne, Stan; Morgan, Cheri; Stevens, Jeffrey; wendy.vit@dnr.mo.gov; Bybee, Darcy
Subject: Courtesy Copy: Missouri Air Conservation Commission - March 28, 2019 Public Hearing

This is a courtesy copy of an email bulletin sent by Cheri Morgan.

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Missouri Air Conservation Commission Will Hold Public Hearing

The Missouri Air Conservation Commission will hold a public hearing on Thursday, March 28, 2019 beginning at 9 a.m. at the Elm Street Conference Center, 1730 East Elm Street, Lower Level, Bennett Springs Conference Room, Jefferson City, Missouri. The commission will hear testimony related to the following proposed action(s):

- Missouri State Implementation Plan Revision - Interstate Transport provisions for the 2015 Ozone Standard

This plan demonstrates how Missouri's State Implementation Plan (SIP) meets the requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 ozone National Ambient Air Quality Standard (NAAQS). This plan demonstrates how Missouri is addressing the requirement that every state's SIP must include provisions that prohibit emissions in the state from significantly contributing to nonattainment or interfering with maintenance of the 2015 ozone NAAQS in any downwind state. If the commission adopts this plan, the department intends to submit it to EPA for inclusion in the Missouri State Implementation Plan.

Documents for the above item(s) will be available for review at the Missouri Department of Natural Resources, Air Pollution Control Program, 1659 Elm Street, Jefferson City, (573) 751-4817 and in the Public

Notices section of the program web site www.dnr.mo.gov/env/apcp/public-notices.htm. This information will be available at least 30 days prior to the public hearing date.

The department will accept comments for the record until 5 p.m. on April 4, 2019. Please send written comments to Chief, Air Quality Planning Section, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176. Email comments may be submitted via the program web site noted above. All comments and public hearing testimony will be equally considered.

Citizens wishing to speak at the public hearing should notify the secretary to the Missouri Air Conservation Commission, Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, or telephone (573) 751-7840. The department requests persons intending to give verbal presentations also provide a written copy of their testimony to the commission secretary at the time of the public hearing.

Persons with disabilities requiring special services or accommodations to attend the meeting can make arrangements by calling the program directly at (573) 751-4817, the Division of Environmental Quality's toll free number at (800) 361-4827, or by writing two weeks in advance of the meeting to: Missouri Department of Natural Resources, Air Conservation Commission Secretary, P.O. Box 176, Jefferson City, MO 65102. Hearing impaired persons may contact the program through Relay Missouri, (800) 735-2966.\TTY.

We'd like your feedback on the service you received from the Missouri Department of Natural Resources. Please consider taking a few minutes to complete the department's Customer Satisfaction Survey at surveymonkey.com/r/MoDNRsurvey. Thank you.



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On Public Notice | **Proposed for Adoption**



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On Public Notice

Missouri State Implementation Plan Revision - Interstate Transport provisions for the 2015 Ozone Standard

This plan demonstrates how Missouri's State Implementation Plan (SIP) meets the requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2015 ozone National Ambient Air Quality Standard (NAAQS). This plan demonstrates how Missouri is addressing the requirement that every state's SIP must include provisions that prohibit emissions in the state from significantly contributing to nonattainment or interfering with maintenance of the 2015 ozone NAAQS in any downwind state. If the commission adopts this plan, the department intends to submit it to EPA for inclusion in the Missouri State Implementation Plan.

[Interstate Transport provisions for the 2015 Ozone Standard](#)

Submit comments now

A public hearing for this plan action will be held on March 28, 2019. Comments about this plan action will be accepted through close of business on April 4, 2019.

Proposed for Adoption

Missouri State Implementation Plan Revision - Infrastructure Elements for the 2015 Ozone Standard

This plan addresses infrastructure elements for the 2015 ozone 8-hour National Ambient Air Quality Standard (NAAQS), as required by Clean Air Act Section 110. The plan provides for the implementation, maintenance, and enforcement of this standard for all areas of the state. Missouri is demonstrating it has adequate resources and authority to implement the 2015 ozone NAAQS through state laws and regulations. Pursuant to Clean Air Act Section 110(a)(2)(G), this submission also requests the U.S. Environmental Protection Agency (EPA) to exempt two areas in the state from the requirement to have a contingency plan in place for ozone emergency episodes. Missouri is developing separate plans to address the Clean Air Act elements pertaining to nonattainment areas and the interstate transport provisions for the 2015 ozone NAAQS. If the commission adopts this plan, the department intends to submit it to EPA for inclusion in the Missouri State Implementation Plan.

A public hearing for this plan action was held on Jan. 31, 2019. Comments about this plan action were accepted through close of business on Feb. 7, 2019. Revisions to the plan were made as a result of comments received. The revised plan is linked below along with a summary of the comments received and the corresponding responses from the department. The plan will be presented to the Missouri Air Conservation Commission for adoption on March 28, 2019.

[Infrastructure Elements for the 2015 Ozone Standard](#)

[Summary of Comments and Responses](#)

Contact Information

Air Pollution Control Program

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 Jefferson City, MO 65102
 800-361-4827
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MISSOURI AIR CONSERVATION COMMISSION
PUBLIC HEARING
Missouri Department of Natural Resources
1730 East Elm Street
Jefferson City, Missouri 65101

MARCH 28th, 2019

1 (The meeting commenced at 9:03 a.m.)

2 MR. PENDERGRASS: The hearing will come to
3 order. Let the record show the following
4 commissioners are present. Gary Pendergrass,
5 Ron Boyer, Kevin Rosenbohm, and Mark Garnett.

6 The Air Conservation Commission with the
7 State of Missouri has called this public hearing
8 pursuant to Section 634.050.12 in accordance with
9 Section 643.070, Revised Statutes of Missouri, and
10 EPA Promulgated Rule 40 CFR 51.102 for the purpose
11 of hearing testimony related to Missouri state
12 Implementation Plan Revision Interstate Transport
13 Provisions for the 2015 ozone standard.

14 The hearing record will close at 5:00 p.m.
15 on April 4, 2019. Anyone who has not been scheduled
16 to appear but who wishes to be heard should indicate
17 that you wish to speak on the sign-in sheets
18 available at the door. Section 643.100 of the
19 Missouri statutes provides that all oral testimony
20 be given under oath and recorded. Accordingly, when
21 you're called to testify, please present yourself to
22 the court reporter first to be sworn in. When you
23 testify, please state your name, business address,
24 and your occupation or affiliation. If you have
25 prepared a statement, it will be helpful if you

1 pollution control agencies; Illinois, Kansas, and
2 other surrounding states, and the U.S. Environmental
3 Protection Agency of this public hearing.

4 Chairmen, this concludes my testimony.

5 YUNFENG "CLIFF" LI,
6 of lawful age, being first duly sworn, testifies as
7 follows:

8 MR. LI: Good morning, Mr. Chairmen,
9 members of the Commission. My legal name is Yunfeng
10 Li, and I go by the nickname Cliff. I am employed
11 with the Missouri Department of Natural Resources
12 Air Pollution Control Program. I work at 1659 East
13 Elm Street, Jefferson City, Missouri. I'm here
14 today to present testimony for a **proposed revision**
15 **to the State Implementation Plan (or SIP) for the**
16 **Interstate Transport Provisions of the 2015 ozone**
17 **National Ambient Air Quality Standard (or NAAQS).**
18 The plan starts on the page 131 of your briefing
19 document.

20 On October 26, 2015, EPA finalized a
21 revised NAAQS for ground-level ozone. The revision
22 strengthened the ozone standard, decreasing it from
23 75 parts per billion (or ppb) to 70 ppb. Based on
24 the three-year average of the annual fourth highest
25 daily maximum eight-hour average concentrations.

RECOMMENDATION FOR ADOPTION

MISSOURI STATE IMPLEMENTATION PLAN REVISION –

Interstate Transport Provisions for the 2015 Ozone Standard

On March 28, 2019, the Missouri Air Conservation Commission held a public hearing for the Missouri State Implementation Plan (SIP) revision titled – *Interstate Transport Provisions for the 2015 Ozone Standard*. A summary of comments received and the air program’s corresponding responses is included on the following pages. Revisions were made to the proposed plan as a result of comments received.

The revised plan has not been reprinted in the briefing document due to its volume. However, the Executive Summary is included below for reference. The entire revised plan is available for review at the Missouri Department of Natural Resources’ Air Pollution Control Program, 1659 East Elm Street, Jefferson City, Missouri, 65101, (573)751-4817. It is also available online at <http://dnr.mo.gov/env/apcp/stateplanrevisions.htm>.

The air program recommends the commission adopt the plan as revised. If the commission adopts this plan, the department intends to submit it to the U.S. Environmental Protection Agency for inclusion in the Missouri State Implementation Plan.

EXECUTIVE SUMMARY

The purpose of the State Implementation Plan (SIP) revision included in this document is to address Missouri's interstate air pollution transport obligations for the 2015 ozone National Ambient Air Quality Standard (NAAQS). Specifically, this SIP revision addresses Missouri's requirements under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I) for the 2015 ozone NAAQS. This section of the CAA requires states to include adequate provisions in their SIPs to prohibit emissions that will contribute significantly to nonattainment, or interfere with maintenance, in any downwind state with respect to any NAAQS. These interstate air pollution transport obligations help ensure that emissions in one state are not causing or contributing to air pollution problems in another state, and are often referred to as good neighbor SIPs.

Missouri's good neighbor SIP under the 2015 ozone NAAQS follows the U.S. Environmental Protection Agency (EPA)'s four-step approach and corresponding memorandums for determining obligations for upwind states to limit transported air pollution to downwind states. The analysis and conclusions in this document stem largely from modeling performed by EPA to determine ozone concentrations across the country and the corresponding contributions from upwind states in the year 2023. This future year corresponds to the year before the attainment deadline for areas designated as moderate nonattainment areas under the 2015 ozone NAAQS. Based on this analysis, after implementation of all on-the-books control measures in Missouri and other upwind states, emissions from Missouri will not contribute significantly to nonattainment or interfere with maintenance of the 2015 ozone NAAQS in any downwind states.

Through the SIP revision and corresponding technical demonstration included in this document, the Missouri Department of Natural Resources' Air Pollution Control Program (air program) is requesting EPA to fully approve Missouri's SIP under CAA Section 110(a)(2)(D)(i)(I) with respect to the 2015 ozone NAAQS.



COMMENTS AND RESPONSES ON

MISSOURI STATE IMPLEMENTATION PLAN REVISION INTERSTATE TRANSPORT PROVISIONS FOR THE 2015 OZONE STANDARD

The public comment period for the Missouri State Implementation Plan (SIP) revision titled *Interstate Transport Provisions for the 2015 Ozone Standard* opened on February 25, 2019 and closed on April 4, 2019. Revisions to the proposed plan were made as a result of comments.

The following is a summary of comments received and the Missouri Department of Natural Resources' Air Pollution Control Program's (air program's) corresponding responses. Any changes to the proposed plan are included in the response to comments.

SUMMARY OF COMMENTS: During the public comment period for the proposed plan, the air program received written comments from the U.S. Environmental Protection Agency (EPA), Associated Electric Cooperative Incorporated (AECI), Ameren Missouri (Ameren), and Dave Flannery of Steptoe Johnson on behalf of the Midwest Ozone Group (MOG).

COMMENT #1: AECI, Ameren, and MOG all submitted comments supporting Missouri's proposed good neighbor SIP for the 2015 ozone standard and the conclusion that that no additional emissions reductions beyond existing and planned on-the-books controls are necessary for Missouri to comply with CAA Section 110(a)(2)(D)(i)(I).

RESPONSE: The air program appreciates all the comments in support of Missouri's proposed good neighbor SIP for the 2015 ozone standard. No changes were made to the proposed plan as a result of these comments.

COMMENT #2: EPA commented that one of the statements in the background section of the proposed SIP revision regarding the NO_x SIP call and NO_x Budget Program was not entirely accurate. EPA stated that the NO_x SIP call was originally promulgated to address both the 1979 and the 1997 ozone standards; however, EPA stayed the implementation of the NO_x SIP Call for the purposes of addressing the 1997 standard. Therefore, when the NO_x Budget Program went into effect, it only addressed good neighbor obligations under the 1979 ozone standard.

RESPONSE AND EXPLANATION OF CHANGE: In response to this comment, the air program has revised the statements in the background section of the proposed SIP revision to more accurately describe which ozone standards the NO_x SIP Call and the NO_x Budget Program addressed.

COMMENT #3: EPA commented that one of the statements in the background section of the proposed SIP revision regarding the description of step 3 in EPA's 4-step process was slightly different than the language in EPA's guidance documents on the 4-step process. EPA provided

the language from their guidance documents and recommended that the air program adjust the language in the proposed SIP revision regarding the description of step 3 so that it matches the language in EPA's guidance documents.

RESPONSE AND EXPLANATION OF CHANGE: In response to this comment, the air program has revised the language in the background section of the proposed SIP revision regarding the description of step 3 of the good neighbor SIP process in order to match the description of step 3 as provided in EPA's guidance documents.

COMMENT #4: EPA commented that one of the statements in the background section of the proposed SIP revision regarding the description of EPA's October 2018 memo was slightly different than the language provided in the memo. EPA recommended the air program revise the language in the proposed SIP revision to more clearly explain the flexibilities provided in the memo regarding the alternative methods for identifying maintenance receptors.

RESPONSE AND EXPLANATION OF CHANGE: In response to this comment, the air program has revised the language in the background section of the proposed SIP revision regarding the description of EPA's October 2018 memo to ensure the language in the SIP is not altering the meaning of the language provided by the EPA October memo.

Due to the similar nature of the following two comments, one response is provided for both comments.

COMMENT #5: EPA commented that although the summers of 2010 and 2011 were conducive to ozone formation in Michigan, the summer of 2009 was the fifth coldest summer on record in Michigan. EPA recommended that the air program provide additional support for the statement that the meteorology from the alternative base period of 2009-2011 as whole was conducive to ozone formation for the Allegan County, Michigan monitor.

COMMENT #6: MOG commented that although EPA offers the caution in their EPA October 2018 memo that the summer of 2009 was generally not conducive for ozone formation, the demonstration for this monitor does not rely on 2009 exclusively. MOG states that the alternative base period selected for the monitor also includes the average of the years 2010 and 2011, which are clearly are ozone conducive years.

RESPONSE AND EXPLANATION OF CHANGE: In response to these comments, the air program has revised section 3.5 of the proposed SIP revision to provide additional support in the demonstration showing that the alternative base period of 2009-2011 was conducive to ozone formation in Allegan County, Michigan. Daily temperatures, precipitation, and wind speed can all affect ozone levels. In general, warm dry weather is more conducive to ozone formation than cool wet weather. Wind speed can affect both the location and concentration of ozone pollution. Higher wind speeds in an area are less conducive to high ozone concentrations than low speeds because higher wind speeds tend to disperse ozone concentrations before they build up to higher levels that cause exceedances. A review of 2009 National Weather Service data from May through September (the high ozone season) from the West Michigan Regional Airport (KBIV) provides the following observations:

- There were 45 days where the high temperature reached 80 degrees Fahrenheit or greater;
- There were 97 days with no precipitation;
- There were 65 days where the average wind speed was 5 miles per hour or less; and
- There were 25 days during these months where all three of the above listed criteria for temperature, wind speed, and precipitation were met.

These observations show that although the summer of 2009 in Michigan was the fifth coolest summer on average for the entire summer, there was still a large number of days during the high ozone season where the meteorology was conducive to ozone formation. This supports the conclusion that the alternative base period, including a large number of days in 2009, was conducive to ozone formation. In order to address EPA's concerns about the proposed SIP revision's use of the words "as a whole" when referring to the meteorology from 2009-2011, the air program revised the language in the proposed SIP to state that two of the three years in the alternative base period (2010 and 2011) were highly conducive to ozone formation and that ozone conducive meteorology was also present during a large number of days from May through September of 2009.

In addition to including the supplemental analysis regarding the summer of 2009 in Michigan, the air program also added language to this section of the proposed SIP revision to include two additional observations to further support the conclusion that the alternative base period was conducive to ozone formation in the area surrounding the Allegan monitor. The first additional observation is an analysis showing that even if the 4th highest 8-hour ozone concentration from 2009 was ignored when computing the base year design value and the analysis only used the average of the 4th highest values from 2010 and 2011 to compute the base year design value (both of which had meteorology that was highly conducive ozone formation), the receptor would still demonstrate attainment in 2023. The second observation is that if the analysis used a 4-year average from 2009 to 2012 to compute the base year design value, the receptor would demonstrate attainment by 2023 under this scenario as well. This second observation explains that the summer of 2012 was an extreme outlier in the direction of highly ozone conducive summers. This was the year of the historic drought that plagued almost the entire Midwestern portion of the country. During that summer, monitors all across the Midwest including Missouri and Michigan recorded ozone concentrations among the highest in the past decade and the number of ozone exceedances was far higher than any recent year. The Allegan monitor recorded 36 exceedances of the 2015 ozone standard that summer compared to an average of six or seven exceedances in all other years from 2010 – 2017. Therefore, by using a 4-year average which includes the extreme outlier in the summer of 2012, it balances out any favorable meteorology from 2009. Then after adding in the summers of 2010 and 2011, which are both clearly ozone conducive summers, it clearly tips the balance towards highly ozone conducive meteorology for the alternative base period, and the use of this 4-year average to compute the alternative base period design value would still demonstrate attainment at the Allegan, Michigan receptor by 2023.

Due to the similar nature of the following two comments, one response is provided for both comments.

COMMENT #7: EPA commented that in Section 3.5 of the proposed SIP revision the air

program should provide a stronger basis (such as public announcements or filings) for asserting that a number of power plants in the state are planned for retirement prior to 2023, but those retirements were not reflected in EPA's 2023 modeling. EPA stated that if such information is not available, the air program should remove the table from the SIP. EPA also stated that if the air program keeps the table in the SIP, it would strengthen the demonstration if the air program provided a discussion regarding the anticipated generation shifting that will result to make up the lost generation from these plants retiring prior to 2023.

COMMENT #8: MOG commented that Missouri's plan was overly conservative because the plan relied on EPA modeling data that over-estimated NO_x emissions from electric generating units because the modeling did not consider the impact of the announced retirements of several coal-fired boilers that will occur in the next several years.

RESPONSE AND EXPLANATION OF CHANGE: In response to these comments, the air program reviewed the available data on the announced power plant retirements that were listed in the proposed SIP revision. Upon review, the air program notes that the owner of at least one of the units listed in the table of the proposed SIP revision had announced a planned retirement for the unit, but was recently denied regulatory approval to retire the unit, which means the retirement date for that unit is now uncertain. Additionally, the air program's intention with this section of the proposed SIP was to provide additional information regarding expected emission reductions that were above and beyond those reflected in EPA's modeling the air program largely relied upon in the analysis. However, this section of the SIP is not critical to the demonstrations and overall conclusions of the SIP, and is unnecessary to include after making the demonstration for the Allegan monitor based on the flexibility described in EPA's October memo. Therefore, the air program removed this section from the proposed SIP in order to eliminate the overly conservative nature of the demonstration and to address EPA's concerns.

COMMENT #9: EPA commented that the air program could strengthen the SIP by providing a demonstration showing that the emission rates used in EPA's 2023 modeling for power plants controlled with selective catalytic reduction (SCR) are reasonable future estimates, particularly for SCR-controlled units that have shown wide degrees of variability in NO_x emission rates in the past. EPA's comment specifically mentions two such sources with observed high year-to-year variability in ozone season NO_x emission rates, the Thomas Hill Energy Center and the New Madrid Power Plant.

RESPONSE: In response to this comment, the air program reviewed the reported ozone season NO_x emission rates from these two facilities since 2015, the initial implementation year for the Cross-State Air Pollution Rule (CSAPR). According to data from EPA's Clean Air Markets Division (CAMD), the units at these two facilities appear to have operated their SCR control technology during the regulatory ozone seasons (May-September) in 2015, 2017, and 2018. However, based on the reported emission rates in CAMD's system, the facilities do not appear to have operated their SCR controls during the regulatory ozone season in 2016.

CSAPR implementation originally began in 2015 after lengthy litigation where the Supreme Court ultimately upheld EPA's general CSAPR framework. During the first two years of CSAPR implementation (2015 and 2016), CSAPR's variability and assurance provisions did not apply.

This means there was no surrender penalty if a state were to exceed its assurance level during these two years. Since 2015 was the first year of CSAPR implementation, there were no banked allowances at the beginning of the 2015 ozone season. This helped to ensure that NO_x ozone season allowance prices in 2015 were sufficiently high enough to encourage SCR-controlled units to run their control technology to reduce their NO_x emissions during the 2015 regulatory ozone season. However, on December 3, 2015, EPA's proposed rulemaking for the CSAPR Update Rule was published in the federal register.¹ In this action, EPA proposed new NO_x ozone season budgets that would take effect in 2017 in order to help address good neighbor obligations under the 2008 ozone NAAQS. In the proposed rule, EPA solicited comment on a number of approaches for addressing the treatment of banked NO_x ozone season allowances that were expected to accrue during the ozone seasons in 2015 and 2016 for the purposes of compliance in 2017 and beyond, when the proposed Update Rule would take effect. EPA's proposed approach was to develop an exchange ratio at either two-to-one or four-to-one for allowances banked during the 2015 or 2016 ozone seasons. However, EPA also specifically solicited comment on an approach that would completely disallow the use of 2015 and 2016 banked allowances for the purposes of compliance starting in 2017, which was the same approach EPA took during the transition from the Clean Air Interstate Rule to CSAPR between 2014 and 2015. If EPA had finalized that approach, any banked allowances from 2015 or 2016 would have lost all value starting in 2017. This proposed rulemaking combined with a projection that over 200,000 NO_x ozone season allowances would be banked after the 2016 control period caused NO_x ozone season allowance prices to drop significantly before the start of the 2016 ozone season. These low allowance prices, combined with the fact that CSAPR's variability and assurance provisions were not in effect during 2016, created a compliance mechanism for SCR-controlled units to simply purchase allowances at low cost to cover emissions and comply with the rule as opposed to running their control technology, which would have been a far more expensive compliance strategy.

EPA's final CSAPR Update rule was published in the federal register on October 26, 2016², which was after the end of CSAPR's 2016 regulatory ozone season. The requirements of the Update Rule went into effect in 2017 and included new, lower NO_x ozone season budgets for 22 states in the eastern half of the country. In addition to the lower budgets, the Update Rule also provided for the CSAPR variability and assurance provisions to take effect in 2017 and significantly reduced the number of banked 2015 and 2016 vintage year allowances that could be used for compliance in 2017 and beyond for these 22 states subject to the Update Rule. Since the implementation of the CSAPR Update Rule, the two units identified in EPA's comment have operated their SCR control technology during the regulatory ozone seasons. EPA's future year emission projections for EGUs in their 2023 modeling are based on an engineering growth analysis that EPA performed after evaluating on-the-books control requirements including the CSAPR Update Rule. Therefore, Missouri believes the future year emission projections that EPA developed for their 2023 modeling are reasonable.

The CSAPR's variability and assurance provisions provide a strong deterrent for sources that may wish to purchase allowances as their sole method to comply with the regulation. If a state exceeds its assurance level during a control period, then all units under a common designated

¹ 80 FR 75706, December 3, 2015

² 81 FR 74504, October 26, 2016

representative that exceed their combined assurance level must not only surrender allowances to cover their emissions, but also surrender penalty allowances up to a ratio of 2-to-1. This means that units that exceed their individual assurance level may have to surrender up to three allowances for every ton of emissions above the level. This provision in the rule makes this type of compliance strategy potentially very costly and likely unsustainable. This is further demonstrated by the fact that the units EPA identified have ran their control technology as opposed to purchasing allowances each year since the variability and assurance provisions of the CSAPR Update rule took effect.

Finally, the CSAPR Update Rule established the CSAPR NO_x Ozone Season Group 2 Trading Program. This is a cap and trade program specifically aimed at addressing region-wide good neighbor obligations for all states that are subject to the rule, albeit for a previous ozone NAAQS. In 2018, the Missouri Air Conservation Commission adopted an amendment to 10 CSR 10-6.374 to incorporate the CSAPR NO_x Ozone Season Group 2 Trading Program requirements into Missouri's SIP, and the air program has submitted that SIP revision to EPA for approval. The purpose of the program is to drive region-wide emission reductions using a market-based mechanism (allowances) that causes monetary value to be assigned for the permission to emit the pollutant of concern. Units where cost effective controls are available tend to over-control their emissions and then they sell their excess allowances to units where installing and operating additional control technology is more costly or uneconomic. This allows those units that over-control and sell their allowances to recoup a portion of the costs they incur to install and operate their new controls. This means that if a unit decides to comply with the rule by purchasing allowances from other units as opposed to installing and operating controls that reductions above and beyond what were required are occurring elsewhere in the region. If a unit in Missouri, which is located over 250 miles away from any of the nonattainment or maintenance receptors identified for further evaluation in the proposed SIP revision, were to purchase allowances to comply with the rule, then this likely means that emission reductions beyond what were expected will be occurring at locations that are closer to the areas of concern. Therefore, this would have an even greater impact in reducing ground-level ozone concentrations in these areas. This means the beneficial impact to the downwind areas, which is the purpose of the Clean Air Act's good neighbor provision, will be achieved regardless of the compliance strategy selected by individual units, especially units with such significant distance from the receptors of concern. No changes to the proposed SIP were made as a result of this comment.

Due to the similar nature of the following three comments, one response is provided for all three comments.

COMMENT #10: EPA commented that the air program should provide more technical and legal support in the SIP regarding the analysis of international contribution to the Allegan monitor, specifically why it would be appropriate to subtract 100 percent of the contributions from Canada and Mexico and two percent of the initial and boundary conditions when analyzing the 2023 design value at the Allegan receptor.

COMMENT #11: MOG commented that the Allegan monitor and others, such as Sheboygan, would certainly be in attainment of the 2015 ozone standard in 2023 if international contributions are considered, and that this is necessary to avoid over-control in upwind states. MOG also

explains that if EPA were to promulgate a federal plan, the Supreme Court ruling in *EME Homer City vs. EPA*³, prevents EPA from promulgating requirements that result in over-control in any upwind state.

MOG stated that there can be no doubt that international emissions have a significant impact on ozone measurements at all monitors related to the Missouri Plan. MOG also provided additional data and analysis relating to the way that international emissions affect the Sheboygan County, Wisconsin receptor, and that consideration of international contributions to that receptor would change that receptor's status from nonattainment to maintenance in 2023.

RESPONSE AND EXPLANATION OF CHANGE: In response to these comments, the air program reviewed the data that MOG provided along with the all the memos that EPA has provided in relation to states' good neighbor SIPs for the 2015 ozone standard. The air program generally agrees with MOG's assertion that upwind states should be afforded the flexibility to consider international contributions when determining upwind state obligations under the good neighbor provision. However, EPA has not provided any clear guidance on what the agency believes is the appropriate method for states to consider international contributions in their good neighbor SIP analyses. This appears to imply that EPA may have some legal or policy uncertainty regarding this issue. Similar to the air program's response regarding the planned retirements, this section of the proposed SIP revision is not critical to the demonstrations and overall conclusions of the SIP, and is unnecessary to include after making the demonstration for the Allegan monitor based on the flexibility described in EPA's October memo. Therefore, the air program removed this section from the proposed SIP in order to alleviate any potential concerns that EPA may have in regards to approving Missouri's SIP with this discussion regarding international contributions still included.

COMMENT #12: EPA commented that the air program could further strengthen the SIP by including a comprehensive analysis of the existing NO_x emitting sources in the state, and providing an analysis of existing controls, cost of new controls, and the NO_x reduction potential for any new control options identified.

RESPONSE: In response to this comment, the air program considered the time and effort it would take to include an additional analysis such as this in Missouri's good neighbor SIP for the 2015 ozone standard. The air program believes that such a comprehensive analysis could take a year or longer and would require a significant amount of the air program's limited technical staff and resources to accomplish. This would divert time and efforts away from other air planning priorities, including those with statutory deadlines. It is challenging for states to conduct a rigorous in-depth analysis such as this given the short period of time between the availability of EPA guidance, transport modeling results, and the submittal deadline. The air program actively participates in numerous regional and national emission inventory and modeling platform development activities and complies with EPA's federal Air Emissions Reporting Rule. These activities help ensure that emission information from Missouri sources along with any known or planned controls or retirements are accurate in any regional or national inventory or modeling analysis EPA and other groups conduct.

³ *EME Homer et.al. v EPA*, 134 S. Ct. at 1608

Although providing such a rigorous analysis in this SIP may be helpful in providing additional support and weight of evidence, the current findings and analyses in the SIP that conclude that no additional reductions are necessary beyond known and planned control measures based on EPA's 4-step process are adequately substantiated in the SIP revision. Therefore, no changes to the proposed SIP were made as a result of this comment.

COMMENT #13: Ameren commented that the air program should provide additional consideration in the SIP regarding the significant distance from Missouri sources to all of the receptors the air program identified for further analysis in the proposed SIP. They stated that all of these receptors appear to be much more heavily influenced by localized emissions that contribute to ozone generation.

RESPONSE AND EXPLANATION OF CHANGE: In response to this comment, the air program has included additional language in the introduction to Chapter 3 where the SIP identifies specific receptors for further analysis in order to include the observation of the significant distance between Missouri and the identified receptors. The air program also added language to the proposed SIP in the various sections of Chapter 3 to provide the approximate distance from Missouri to each receptor evaluated in this Chapter of the SIP.

Due to the similar nature of the following two comments, one response is provided for both comments.

COMMENT #14: Ameren commented that the air program should include a discussion that provides more weight to the significant in-state contributions to the receptors included in the evaluations of the proposed SIP revision. They stated that mobile sources are the largest source of local emissions that are contributing to the ground-level ozone concentrations at these receptors.

COMMENT #15: MOG commented that mobile source emissions are the dominant contributor to predicted ozone concentrations across the nation. MOG stated that the analysis they performed provides not only the significant relative contribution of mobile and local area sources to problem monitors, but also how a small reduction in emissions from these sources could bring about significant additional reductions in ozone concentrations. MOG states that due to the dominant role of the mobile source impact on ozone air quality, additional local mobile source controls in downwind states should be evaluated and implemented before requiring additional emission reductions from upwind states.

RESPONSE: In response to this comment, the air program reviewed the information provided by Ameren and MOG regarding the relative contribution from local mobile emission sources to the predicted ozone concentrations for the receptors the air program evaluated in the proposed SIP. The air program agrees local mobile source emissions are significant contributors to ozone formation at all of the receptors the air program evaluated. The air program also agrees that it is rational that upwind states should be afforded some flexibility in evaluating the potential for local controls that will have a much greater impact on downwind state ozone concentrations before determining obligations for distant upwind states. However, the statutory deadline listed in the Clean Air Act directs states to develop their SIPs under Section 110(a)(2), which includes

the good neighbor provision, for any new or revised NAAQS within three years of the promulgation of the standard. In contrast, ozone nonattainment area plans that include the local control measures for nonattainment areas are typically not due until 4 to 6 years after the promulgation of a new or revised NAAQS. Further, the decisions about local measures in nonattainment area plans are the primary responsibility of the state or local air pollution control agencies with jurisdiction in the nonattainment area, which makes it difficult for upwind states to determine what type of control measures may be implemented or feasible in downwind states before the statutory deadline for the good neighbor SIP. Therefore, although the air program generally agrees with the rationale of these comments, the addition of such a discussion in the SIP would be difficult to accomplish with any degree of certainty. Further, while the addition of such a discussion may add strength to the demonstrations and conclusions of the SIP, the air program does not believe the addition of such discussions are necessary to support the overall conclusions in the proposed SIP. No changes to the proposed SIP were made as a result of these comments.

COMMENT #16: Ameren commented that the air program should point out that Missouri's total projected contribution to the Sheboygan, Wisconsin receptor in 2023 is less than the amount needed for the monitor to come into compliance with the 2015 ozone standard, meaning even if Missouri had no contribution to this receptor, its projected 2023 design value would still violate the standard. Ameren then points out that the in-state contribution to this monitor is 15.73 ppb and border state contributions (IL and IN) are 16.20 ppb combined, these states contribute 43.86 percent of the modeled ozone concentration for this receptor in 2023. Therefore, the required reductions should come from these three significant contributors to achieve the needed 1.9 ppb reductions in ozone concentrations to attain the standard. They state that Missouri's 1.37 ppb projected contribution to this receptor pales in comparison to these three contributing states.

RESPONSE: In response to this comment, the air program reviewed the EPA modeling results for upwind state contributions with respect to the Sheboygan, Wisconsin receptor. The air program agrees with Ameren that Missouri's projected contribution to this receptor is insignificant when compared to the projected in-state and border state contributions. The air program also agrees that based on EPA's modeling results, even if 100 percent of Missouri's contribution were eliminated it would not be enough to bring this receptor into attainment in 2023. However, per the proposed SIP revision, EPA's August memo provides the rationale for a 2 ppb contribution threshold at step 2 for this particular receptor. Thus, the analysis in the proposed SIP revision eliminates this receptor from further analysis at step 2 of the 4-step process. Therefore, no additional discussion is needed to make the necessary demonstration for this receptor based on EPA's 4-step process. Further, the air program believes that the addition of such a discussion in the SIP could hinder EPA's future approval of the plan if they disagreed with the rationale of the requested additional language. Therefore, no changes to the proposed plan were made as a result of this comment.

Due to the similar nature of the following three comments, one response is provided for all three comments.

COMMENT #17: AECI commented that the air program should include Michigan's projected in-state contribution to the Allegan County, Michigan receptor before deriving any type of reduction obligation for any contributing upwind states in subsection 3.5.2 of the proposed SIP

revision.

COMMENT #18: EPA commented that in subsection 3.5.2 of the proposed SIP revision, the air program should provide additional support for concluding that Missouri's calculated share of upwind state emission reduction responsibility is sufficiently small and within a 5 ppb margin of error in the modeling. EPA states that the air program should further explain how the 5 ppb modeling error was derived as it does not match the state-specific or region specific performance statistics in the technical support document for EPA's updated 2023 projected ozone design values.

COMMENT #19: MOG commented that the air program's analysis of upwind state emission reduction responsibility in subsection 3.5.2 of the proposed SIP revision is overly conservative as it would provide the exact same level of treatment for maintenance receptors as for nonattainment receptors. MOG urged the air program to take a position that no additional control is needed to address a maintenance receptor if it is apparent that emission and air quality trends make it likely that a maintenance receptor will remain in attainment.

RESPONSE AND EXPLANATION OF CHANGE: In response to these comments, the air program reviewed the modeled upwind state contributions identified for the Allegan monitor and the corresponding derived upwind state reduction obligations in the proposed SIP revision. The air program believes that while consideration of in-state reduction obligations prior to determining upwind state reduction obligations is difficult to achieve due to statutory deadlines and jurisdictional issues, AECI's suggestion of including the in-state contribution in the derivation of the pro-rata share of reduction obligations among all contributing states from the proposed SIP revision would be feasible. However, as discussed below, the air program did not add Michigan's in-state contribution to revise the derivation of contributing state reduction obligations, and instead is revising the proposed SIP by removing this subsection.

In response to EPA's comment regarding the margin of error in the modeling that was stated in the proposed SIP, this figure was referring to the mean bias statistic reported for the Northeast, Upper Midwest, Ohio Valley, and Southeast climate regions in EPA's Air Quality Modeling Technical Support Document for the Updated 2023 Projected Ozone Design Values.⁴ However, as discussed below, the air program is not adding this citation to the proposed SIP, and instead is revising the proposed SIP by removing this subsection.

In response to MOG's comment, Missouri agrees that the Clean Air Act includes two separate provisions, one to ensure no significant contribution to nonattainment and another to ensure no interference with maintenance. Missouri also generally agrees with the rationale in MOG's comment that it follows that states should be afforded the flexibility so that the method for determining any reduction obligations to address significant contribution to nonattainment should not be the same as the method for determining what (if any) emission reduction obligations are necessary to ensure an upwind state does not interfere with maintenance in a downwind state. Therefore, Missouri agrees that this subsection in the proposed SIP is overly conservative as it would use the same method for determining obligations for both nonattainment

⁴ Air Quality Modeling Technical Support Document for the Updated 2023 Projected Ozone Design Values, Office of Air Quality Planning and Standards, United States Environmental Protection Agency, June 2018 (page A-5)

and maintenance receptors. In addition, as similarly stated in the responses regarding other sections of the proposed SIP revision, this subsection of the proposed SIP revision is not critical to the demonstrations and overall conclusions of the SIP, and is unnecessary to include after making the demonstration for the Allegan monitor based on the flexibility described in EPA's October memo. Therefore, the air program revised the proposed SIP by removing this subsection in order to address all the concerns raised by the three commenters.

COMMENT #20: EPA commented that throughout the document, the air program uses the term "significant contribution threshold" or "significant threshold", but EPA says that the SIP would more accurately follow EPA's guidance if the air program referred to all of these thresholds more generally as "contribution thresholds", because EPA does not intend for contribution thresholds alone to represent the level of a significant contribution.

RESPONSE AND EXPLANATION OF CHANGE: In response to this comment, the air program revised the proposed SIP revision to more accurately refer to the various thresholds analyzed as "contribution thresholds" as opposed to "significant contribution thresholds" or "significant thresholds".