

Mississippi Department of Environmental Quality
Office of Pollution Control

Proposed State Implementation Plan Revision addressing the Interstate Transport provisions under Section 110(a)(2)(D)(i)(I) (Prongs 1 and 2) of the Clean Air Act for the 2010 1-hour SO₂ NAAQS revised on June 2, 2010

Public Comment Period: August 31, 2021 to September 30, 2021

Introduction

On June 2, 2010, the U. S. Environmental Protection Agency (EPA) promulgated a revised National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO₂) to establish a new primary ambient air quality standard of 75 parts per billion (ppb) (one-hour average), also referred to in this submission as the 2010 1-hour SO₂ NAAQS. Section 110(a) of the Clean Air Act (CAA) requires states to adopt and submit “infrastructure” State Implementation Plans (SIPs) to EPA to address the requirements of §§110(a)(1) and (2) within three years after the promulgation of new or revised NAAQS. The “infrastructure” SIP provides assurances of State resources and authorities to implement the new or revised NAAQS and establishes the basic state programs to implement, maintain, and enforce new or revised standards.

The focus of this SIP revision is to address, for the 2010 1-hour SO₂ NAAQS, CAA Section 110(a)(2)(D)(i)(I), which has two subparts:

Each such plan shall –

(D) contain adequate provisions –

(i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will –

(I) contribute significantly to nonattainment, or interfere with maintenance by, of any other State with respect to any such national primary or secondary ambient air quality standard, or

In this submission, the nonattainment portion is also referred to as “Prong 1” and the maintenance portion is named “Prong 2”.

On June 20, 2013, MDEQ submitted a SIP revision to EPA addressing the infrastructure SIP requirements for the 2010 1-hour SO₂ NAAQS. However, the June 20, 2013, plan did not address prongs 1 and 2. This SIP revision addresses prongs 1 and 2 for the 2010 1-hour SO₂ NAAQS.

State and Federal SO₂ Regulations

A. Mississippi SO₂ Regulations

The following State regulations provide for control of SO₂ emissions from stationary sources and are an approved part of Mississippi’s SIP:

- 11 MISSISSIPPI ADMINISTRATIVE CODE, PART 2, CHAPTER 5, Mississippi Regulations for the Prevention of Significant Deterioration of Air Quality addresses Prevention of Significant Deterioration requirements for new sources in attainment areas.
- 11 MISSISSIPPI ADMINISTRATIVE CODE, PART 2, CHAPTER 2, Permit Regulation for the Construction and/or Operation of Air Emissions Equipment, Section V, addresses nonattainment New Source Review (NSR) for new sources in nonattainment areas.

- 11 MISSISSIPPI ADMINISTRATIVE CODE, PART 2, CHAPTER 2, Section I.D—Permitting Requirements, comprises MDEQ’s minor NSR permitting program.

B. Federal SO₂ Regulations

Federal rules applicable to sources in Mississippi that are designed to reduce SO₂ emissions include:

- EPA’s Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements Rule;
- EPA’s Tier 3 Motor Vehicle Emission and Fuel Standards Rule;
- EPA’s Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements;
- Clean Air Nonroad Diesel Final Rule - Tier 4;
- Mercury and Air Toxics Standards (MATS) - These regulations reduce acid gases, which also result in reductions of SO₂ emissions;
- Acid Rain Program;
- And, New Source Performance Standards (NSPS) for various source categories, including but not limited to Industrial-Commercial-Institutional Steam Generating Units, Sulfuric Acid Plants, Stationary Gas and Combustion Turbines, Portland Cement Manufacturing, and Electric Utility Steam Generating Units (Boilers).

SO₂ Emissions Inventory Data

MDEQ utilized data from EPA’s National Emissions Inventory (NEI) to analyze SO₂ emission trends in Mississippi from 2002 to 2017. Total statewide SO₂ emissions in Mississippi for years 2002-2017 are shown below in Table 1. Table 2 shows SO₂ emissions from Electric Generating Units (EGUs) across the state for the same time period.

Table 1: Mississippi SO₂ Emissions from 2002 to 2017						
Year	2002	2005	2008	2011	2014	2017
Tons	114,465	116,343	89,298	63,940	108,442	12,737

Table 2: Mississippi SO₂ Emissions from 2002 to 2017 for Electric Generating Units (EGUs)						
Year	2002	2005	2008	2011	2014	2017
Tons	67,592	74,120	65,878	43,259	90,733	2,587

As can be seen in Table 1 and Table 2, Mississippi’s statewide annual SO₂ emissions have significantly decreased in recent years. From 2002 to 2017, SO₂ emissions in Mississippi have declined by nearly 90% from 114,465 tons to 12,737 tons, with the majority of these decreases occurring in the years between 2014 and 2017. SO₂ emissions from EGU’s contributed to the largest portion of the decrease during this time, which is shown in Table 2. From 2002 to 2017, statewide annual EGU SO₂ emissions decreased 96% from 67,592 tons to 2,587 tons.

SO₂ Ambient Air Quality

A. AQS Monitors in Mississippi

MDEQ obtained certified monitoring data from EPA’s [Air Quality System \(AQS\)](https://www.epa.gov/air-trends/air-quality-design-values) available at <https://www.epa.gov/air-trends/air-quality-design-values> for monitors located within 50 kilometers (km) of the Mississippi border in both Mississippi and the surrounding states. MDEQ focuses on a 50 km-wide zone to evaluate emission source impacts into neighboring states and SO₂ air quality monitors within 50 km of the State’s border because the physical properties of SO₂ result in relatively localized pollutant impacts near an emissions source that drop off with distance. MDEQ’s selection of this transport distance for SO₂ is based upon the definition of “*Urban scale*” found in 40 CFR 58, Appendix D, Section 4.4.4(4), which states that measurements in this scale would be used to estimate SO₂ concentrations over large portions of an urban area with dimensions from four to 50 km (also known as the “urban scale”).

MDEQ has summarized the SO₂ design values (DVs) from 2014 to 2019 for AQS monitors in Mississippi within 50 km of another state in Table 3 and AQS monitors in neighboring states within 50 km of Mississippi in Table 4 using relevant data from EPA’s AQS DV reports for recent and complete 3-year periods.

As shown in Table 3, DVs for the monitoring sites in Mississippi within 50 km of another state’s border have remained well below the 2010 1-hour SO₂ NAAQS for the 2013-2015 through 2018-2020 time periods.

County	AQS Site Code (ID)	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2017-2019	2018-2020	Distance to Mississippi Border (km)
Jackson	28-059-0006	27	28	21	12	6	5	5	13.3 (AL)

B. AQS Monitors in Neighboring States

There are five AQS monitors in the neighboring states of Alabama, Louisiana, and Tennessee that are located within 50 km of Mississippi.

As shown in Table 4, the DVs from 2012-2014 to 2018-2020 for these monitors are trending downward. While Louisiana AQS monitor 22-087-0007 did record DVs in exceedance of the 2010 1-hour SO₂ NAAQS for the time periods of 2012-2014 to 2014-2016, it has shown a steady decline and been below the standard since the 2015-2017 time period. Furthermore, the nearest sizable Mississippi SO₂ emission source (i.e., >100 tpy SO₂), Rain CII Carbon LLC, is approximately 149 km away from the referenced monitor and reported only 348 tons of SO₂ emissions in 2018, which is currently the most recent year’s emissions data available. Rain CII Carbon LLC was also included in the

modeling of the RD Morrow Plant conducted for purposes of attainment/nonattainment designations under the Data Requirements Rule (DRR) and shown below in Table 5. The modeling indicated the maximum 1-hour modeled SO₂ concentration was 56.49 ppb, which is below the 2010 1-hour SO₂ NAAQS. This leads MDEQ to conclude that SO₂ emissions from Mississippi sources will not contribute significantly to nonattainment or maintenance in Louisiana. As evidenced by Table 4 below, Mississippi sources do not contribute to nonattainment or maintenance in any neighboring state.

Table 4: 2010 1-Hour SO₂ DVs (ppb) for AQS Monitors with Complete, Valid Data Within 50 km of Mississippi in Adjacent States

State	County/ Parish	AQS ID	2012 -2014	2013 -2015	2014 -2016	2015 -2017	2016 -2018	2017 -2019	2018 -2020	Distance to Mississippi Border (km)
AL	Sumter	01-119-0003*	**ND	**ND	**ND	**ND	**ND	**ND	3	13
AL	Mobile	01-097-0003	**ND	**ND	**ND	**ND	11	14	14	31
LA	St. Bernard	22-087-0004	23	19	16	13	10	7	4	44
LA	East Baton Rogue	22-033-0015	**ND	**ND	**ND	**ND	**ND	24	21	46
LA	St. Bernard	22-087-0007	159	114	82	73	59	44	42	47
TN	Shelby	47-157-0075	9	9	8	7	6	4	2	15

* The Sumter County, Alabama monitor with AQS ID: 011190003 began operation in 2018 and thus, does not have any DVs for the 2012-2014 to 2017-2019 time period.

**ND indicates “No Data” due to monitor startup or shutdown (i.e., operated less than three years), data quality issues, or incomplete data.

Available SO₂ Air Dispersion Modeling for Mississippi and Surrounding States’ Sources Within 50 km of the Mississippi Border

A. Available SO₂ Air Dispersion Modeling for Mississippi Sources

MDEQ evaluated all known, existing, valid modeling available for sources in Mississippi located within 50 km of the Mississippi border. Table 5 provides a summary of the modeling. The results show that the maximum 1-hour modeled SO₂ concentrations for these sources are below the 2010 1-hour SO₂ NAAQS and were used in making the 2010 1-hour SO₂ NAAQS Round 2 and 3 designations under the DRR.

Source	County	Distance from Source to MS Border (km)	Other Facilities Included in Modeling?	Modeled 99 th Percentile Daily Maximum 1-Hour SO ₂ Concentration (ppb)	Model Grid Extends into Another State?
Plant Victor Daniel - Mississippi Power Company	Jackson	15	No	56.5 (based on 2012-2014 actual emissions)	Yes (small portion of SW Mobile County, AL)
R.D. Morrow Plant – Cooperative Energy (formerly South Mississippi Electric Power Association)	Lamar	40	Yes, Rain CII Carbon, LLC	56.49 (based on 2012-2014 actual emissions)	No

B. Available SO₂ Air Dispersion Modeling for Surrounding States' Sources

MDEQ also evaluated all known, existing, valid modeling available for sources in other states which are located within 50 km of the Mississippi border. Table 6 provides a summary of the modeling for 2010 1-hour SO₂ NAAQS designations for the SO₂ sources with valid modeling for the purposes of interstate transport of SO₂ in neighboring states which are located within 50 km of the Mississippi border.

The modeling results in Table 6 show that the maximum 1-hour modeled SO₂ concentrations for the sources in this table are below the level of the 2010 1-hour SO₂ NAAQS.

Source	County/Area (State)	Distance from Source to MS Border (km)	Other Facilities Included in Modeling?	Modeled 99 th Percentile Daily Maximum 1-Hour SO ₂ Concentration (ppb)	Model Grid Extends into Another State?
Louisiana Generating LLC - Big Cajun II Power Plant	Pointe Coupee Parish (LA)	28	Yes - Georgia-Pacific Port Hudson, Oxbow Calcining LLC - Baton Rouge	66	No
TVA-Allen Fossil Plant (TVA-Allen)	Shelby County (TN)	9	Yes - Nucor Steel Memphis facility	66 ¹ 31.3 (MS) (based on 2012-2014 actual emissions)	Yes – Southeastern portions of Crittenden County in AR; and small northern portion of DeSoto County, MS

¹ The value of 31.3 ppb at the MS/TN border reflects the modeling summary for TVA-Allen shown in Table 24 on p.23 from the Tennessee Department of Environment & Conservation's July 31, 2019, SIP submission. In Round 3 of designations, the modeled maximum 1-hour SO₂ impact for TVA-Allen was 66 ppb. See EPA's *Technical Support Document, Chapter 38: Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard for Tennessee* at https://www.epa.gov/sites/production/files/2017-08/documents/39_tn_so2_rd3-final.pdf.

There are three additional DRR sources in neighboring states which are located within approximately 50 km of the Mississippi border and which elected to provide air dispersion modeling under the DRR: Alabama Power Company - James M. Barry Electric Generating Plant (Plant Barry); Akzo Nobel Functional Chemicals - LeMoyne Site (AkzoNobel); and PowerSouth Energy Cooperative – Charles R. Lowman Power Plant (Lowman), which are located approximately 38, 43, and 51² km, respectively, from the Mississippi border. These sources are all located in Alabama. With respect to the modeling and other information submitted by Alabama under the DRR for these modeled Alabama sources, EPA previously stated that the Agency does not have sufficient information to determine whether the areas around these sources meet or do not meet the 2010 1-hour SO₂ NAAQS or contribute to an area that does not meet the standard, and thus designated these areas as unclassifiable. Mississippi has no Title V emission sources within 50 km of any of these three Alabama sources, therefore MDEQ concludes that SO₂ emissions from Mississippi do not contribute significantly to nonattainment or maintenance of this area for the 2010 1-hour SO₂ NAAQS.

² Although Lowman is just beyond 50 km from the Mississippi border, MDEQ included this source in its evaluation due to its approximate distance of 51 km from the Mississippi border.

SO₂ Emissions Analysis

A. Mississippi Non-DRR SO₂ Sources

MDEQ assessed the potential impacts of SO₂ emissions from stationary sources not subject to the DRR that emitted over 100 tons of SO₂ and located in Mississippi within 50 km from the border.

MDEQ assessed this information to evaluate whether the SO₂ emissions from these sources could interact with SO₂ emissions from the nearest source in a neighboring state in such a way as to significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in that state. Table 7 lists sources in Mississippi not regulated under the DRR that emitted greater than 100 tons per year of SO₂ in 2018 or 2019 (i.e. the most recent year emissions data available) and are located within 50 km of the State's border.

Mississippi Source	Most Recent SO ₂ Emissions (tons)*	Distance to Mississippi Border (km)	Closest Neighboring State	Distance to Nearest Neighboring State SO ₂ Source (km)	Nearest Neighboring State Non-DRR SO ₂ Source (> 100 TPY SO ₂) & Most Recent Emissions (tons)
Roxul USA Inc.	103 (2019)	2	TN	34	Memphis Intl (231; 2018)
Mississippi Silicon	648 (2018)	19 (AL) 21 (TN)	AL TN	27	Packaging Corporation of America – TN (348; 2019)
Columbus AFB	239 (2018)	17	AL	97	Nucor Tuscaloosa (142; 2019)
Steel Dynamics Columbus	457 (2018)	27	AL	102	Nucor Tuscaloosa (142; 2019)
International Paper, Columbus Mill	125 (2019)	15	AL	89	Nucor Tuscaloosa (142; 2019)
Petro Harvester Operating Company	128 (2018)	11	AL	44	American Midstream Chatom** (5554; 2019)
Chevron Texaco Products	552 (2019)	10	AL	32	W&T Offshore, Inc. (149; 2019)
International Paper, Vicksburg Mill	162 (2019)	21	AL	129	Graphic Packaging International LLC (427; 2019)
Rain CII Carbon LLC	378 (2018)	39	LA	64	International Paper, Bogalusa Mill (664; 2019)

* The 2018 and 2019 annual SO₂ emissions listed in Table 7 are taken from EPA's EIS database

** The American Midstream Chatom plant shutdown on 11/24/2019 and its permit was voided 3/23/2020 according to Alabama Department of Environmental Management (ADEM).

Of the sources identified in Table 7 above, five have a distance of greater than 50 km between it and the nearest neighboring state non-DRR source of over 100 tpy of SO₂ emissions. For these sources, MDEQ has concluded that the distances between the Mississippi sources and the neighboring state sources, along with the combined level of SO₂ emissions from both neighboring sources (the largest combined SO₂ emissions being

between Rain CII Carbon – MS and IP Paper, Bogalusa – LA, totaling 1042 tons SO₂) make it unlikely that SO₂ emissions from the Mississippi sources contribute significantly to nonattainment or maintenance in any of the neighboring states for the 2010 1-hour SO₂ NAAQS.

For the remaining four sources listed in Table 7 above, Tennessee source Packaging Corporation of America is located 27 km from Mississippi source Mississippi Silicon LLC. The two sources combined annual SO₂ emissions, using the most recent available data, total 996 tons. This level of SO₂ emissions, combined with the 27 km distance between the two sources, leads MDEQ to conclude that it would make it unlikely that the SO₂ emissions from Mississippi Silicon LLC could interact with SO₂ emissions from Tennessee source Packaging Corporation of America in such a way as significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in Tennessee.

Mississippi source Roxul USA Inc. is separated by a distance of 34 km from Tennessee source Memphis Intl. and the combined, most recent annual SO₂ emissions for the two facilities totaled only 334 tons of SO₂. The low level of SO₂ emissions leads MDEQ to conclude that it would make it unlikely that the SO₂ emissions from Roxul USA Inc. could interact with SO₂ emissions from Tennessee's Memphis Intl. in such a way as to significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in Tennessee.

Similarly, Mississippi source Chevron Texaco Products is located 32 km from Alabama source W&T Offshore and the two sources combined SO₂ emissions in 2019 totaled 701 tons. The low level of SO₂ emissions leads MDEQ to conclude that it would make it unlikely that the SO₂ emissions from Chevron Texaco Products could interact with SO₂ emissions from Alabama source W&T Offshore in such a way as to significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in Alabama.

Although American Midstream Chatom emitted 5554 tons of SO₂ in 2019, the plant shutdown on 11/24/2019 and their Title V permit was voided on 3/23/20. This closing, along with the relatively low SO₂ emissions from Petro Harvester Operating Company, leads MDEQ to conclude that Mississippi will not contribute significantly to nonattainment or maintenance in Alabama.

B. Neighboring States' Non-DRR SO₂ Sources

MDEQ also assessed the potential impacts of SO₂ emissions from stationary sources not subject to the DRR that emitted over 100 tons of SO₂ and are located in neighboring states but within 50 km from the Mississippi border.

MDEQ assessed this information to evaluate whether the SO₂ emissions from these sources could interact with SO₂ emissions from the nearest source in Mississippi in such a way as to impact a violation of the 2010 1-hour SO₂ NAAQS.

Table 8 lists sources in Neighboring States not regulated under the DRR that emitted greater than 100 tons per year of SO₂ in 2018 or 2019 (i.e. most recent year emissions data available) and are located within 50 km of the Mississippi border.

Table 8: Neighboring States' Non-DRR SO₂ Sources Emitting Greater Than 100 TPY Near Mississippi*				
Source	Most Recent Annual SO₂ Emissions (tons)	Distance to MS Border (km)	Distance to Nearest MS SO₂ Source (km)	Mississippi Non-DRR SO₂ Source (>100 TPY SO₂) & Most Recent Emissions (tons)
SSAB Alabama Inc (AL)	393 (2019)	39	81	Chevron Texaco Products (552 tons; 2019)
Evonik Corporation (AL)	220 (2019)	25	41	Chevron Texaco Products (552 tons; 2019)
WestRock Mill Company, LLC (AL)	267 (2019)	38	92	Petro Harvester Operating Company LLC (128 tons; 2018)
Georgia Pacific (AL)	609 (2019)	37	70	Petro Harvester Operating Company LLC (128 tons; 2018)
Lucite International Inc (TN)	366 (2019)	31	46	Roxul USA Inc (103 tons; 2019)
Nucor Steel Memphis Inc (TN)	284 (2018)	<5	51	Roxul USA Inc (103 tons; 2019)
Chalmette Refining Inc (LA)	194 (2019)	47	149	Rain CII Carbon LLC (378 tons; 2018)
Rain CII Carbon LLC Chalmette Calcining Plant (LA)	1616 (2019)	47	149	Rain CII Carbon LLC (378 tons; 2018)

* Table 8 does not include sources that are duplicative of those in Table 7.

Of the sources identified in Table 8 above, six have a distance of greater than 50 km between it and the nearest Mississippi non-DRR source of over 100 tpy SO₂. For these sources, MDEQ has concluded that the distances between the neighboring state sources and the Mississippi sources, along with the combined level of SO₂ emissions from both neighboring sources, make it unlikely that SO₂ emissions from the Mississippi sources contribute significantly to nonattainment or maintenance in any of the neighboring states for the 2010 1-hour SO₂ NAAQS.

Alabama source Evonik Corporation is located 41 km from Mississippi source Chevron Texaco Products and the two sources' combined SO₂ emissions in 2019 totaled 772 tons. The low level of SO₂ emissions combined with the 41 km distance between the two sources leads MDEQ to conclude that it would make it unlikely that the SO₂ emissions from Chevron Texaco Products could interact with SO₂ emissions from Alabama source Evonik Corporation in such a way as to significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in Alabama.

The low level of SO₂ emissions from Mississippi source Roxul USA Inc leads MDEQ to conclude it to be unlikely to interact with the emissions from Tennessee sources Lucite International and Nucor Steel Memphis, which are both approximately 50 km away, in such a way as to significantly impact the attainment of the 2010 1-hour SO₂ NAAQS in Tennessee.

The 149 km distance between Rain CII Carbon LLC and the two facilities in Louisiana (Chalmette Refining Inc and Rain CII Carbon Chalmette Calcining) lead MDEQ to conclude that the emissions from this facility will not interact with SO₂ emissions from these Louisiana sources in such a way as to impact a violation of the 2010 1-hour SO₂ NAAQS in Louisiana.

Conclusion

MDEQ hereby confirms that Mississippi's SIP contains adequate provisions to prevent stationary sources and other types of emissions activities within the state from contributing significantly to nonattainment in any other state (prong 1) with respect to the 2010 1-hour SO₂ standard. This certification is based on the actual and projected downward trends of SO₂ emissions in Mississippi, DRR modeled predictions, decreasing ambient air quality monitored values in Mississippi and surrounding states, non-DRR emissions data analysis discussed above, and federal and state control measures that are in place. MDEQ hereby also confirms that Mississippi's SIP contains adequate provisions to continue maintenance of the 2010 1-hour SO₂ standard and prevent sources and other types of emissions activities within the state from interfering with maintenance in any other state (prong 2) with respect to the 2010 1-hour SO₂ standard based on SO₂ emission trends in Mississippi and federal and state control measures that are in place.