

Technical Support Document:

Chapter 21

Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard for Mississippi

1. Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (the EPA, we, or us) must designate areas as either “nonattainment,” “attainment,” or “unclassifiable” for the 2010 1-hour sulfur dioxide (SO₂) primary national ambient air quality standard (NAAQS) (2010 SO₂ NAAQS). The CAA defines a nonattainment area as an area that does not meet the NAAQS or that contributes to a nearby area that does not meet the NAAQS. An attainment area is defined by the CAA as any area that meets the NAAQS and does not contribute to a nearby area that does not meet the NAAQS. Unclassifiable areas are defined by the CAA as those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS. In this action, the EPA has defined a nonattainment area as an area that the EPA has determined violates the 2010 SO₂ NAAQS or contributes to a violation in a nearby area, based on the most recent 3 years of air quality monitoring data, appropriate dispersion modeling analysis, and any other relevant information. An unclassifiable/attainment area is defined by the EPA as an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO₂ NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS¹. An unclassifiable area is defined by the EPA as an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO₂ NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.

This technical support document (TSD) addresses designations for all remaining undesignated areas in Mississippi for the 2010 SO₂ NAAQS. In previous final actions, the EPA has issued

¹ The term “attainment area” is not used in this document because the EPA uses that term only to refer to a previous nonattainment area that has been redesignated to attainment as a result of the EPA’s approval of a state-submitted maintenance plan.

designations for the 2010 SO₂ NAAQS for selected areas of the country.² The EPA is under a December 31, 2017, deadline to designate the areas addressed in this TSD as required by the U.S. District Court for the Northern District of California.³ We are referring to the set of designations being finalized by the December 31, 2017, deadline as “Round 3” of the designations process for the 2010 SO₂ NAAQS. After the Round 3 designations are completed, the only remaining undesignated areas will be those where a state has installed and begun operating a new SO₂ monitoring network meeting the EPA specifications referenced in the EPA’s SO₂ Data Requirements Rule (DRR). (80 FR 51052). Since there were no new SO₂ monitoring networks established by the State of Mississippi, the remaining portions of the state will all be designated by the Round 3 deadline.

Mississippi submitted its first recommendation regarding designations for the 2010 1-hour SO₂ NAAQS on July 6, 2011. In our intended designations, we have considered all the submissions from the state, except where a recommendation in a later submission regarding a particular area indicates that it replaces an earlier recommendation for that area we have considered the recommendation in the later submission.

For the areas in Mississippi that are part of the Round 3 designations process, Table 1 identifies the EPA’s intended designations and the counties or portions of counties to which they would apply. It also lists Mississippi’s current recommendations. The EPA’s final designation for these areas will be based on an assessment and characterization of air quality through ambient air quality data, air dispersion modeling, other evidence and supporting information, or a combination of the above, and could change based on changes to this information (or the availability of new information) that alters EPA’s assessment and characterization of air quality.

Table 1. Summary of the EPA’s Intended Designations and the Designation Recommendations by the State Mississippi

Area/County	Mississippi Recommended Area Definition	Mississippi Recommended Designation	The EPA’s Intended Area Definition	The EPA’s Intended Designation
Choctaw County, MS Area	Choctaw County	Unclassifiable/Attainment	Same as State’s Recommendation	Unclassifiable/Attainment
Jackson County, MS Area	Jackson County	Unclassifiable/Attainment	Same as State’s Recommendation	Unclassifiable/Attainment

² A total of 94 areas throughout the U.S. were previously designated in actions published on August 5, 2013 (78 FR 47191), July 12, 2016 (81 FR 45039), and December 13, 2016 (81 FR 89870).

³ *Sierra Club v. McCarthy*, No. 3-13-cv-3953 (SI) (N.D. Cal. Mar. 2, 2015).

Area/County	Mississippi Recommended Area Definition	Mississippi Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
*Rest of the State	Rest of the State	Unclassifiable/Attainment	Same as State's Recommendation	Unclassifiable/Attainment

* The EPA intends to designate the remaining undesignated counties (or portions of counties) in Mississippi as “unclassifiable/attainment” as these areas were not required to be characterized by the state under the DRR and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the areas may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. These areas that we intend to designate as unclassifiable/attainment (those to which this row of this table is applicable) are identified more specifically in Section 5 of this TSD.

Areas that the EPA previously designated unclassifiable in Round 1 (*see* 78 FR 47191) and Round 2 (*See* 81 FR 45039 and 81 FR 89870) are not affected by the designations in Round 3 unless otherwise noted.

2. General Approach and Schedule

Updated designations guidance documents were issued by the EPA through a July 22, 2016, memorandum and a March 20, 2015, memorandum from Stephen D. Page, Director, U.S. the EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. the EPA Regions I-X. These memoranda supersede earlier designation guidance for the 2010 SO₂ NAAQS, issued on March 24, 2011, and identify factors that the EPA intends to evaluate in determining whether areas are in violation of the 2010 SO₂ NAAQS. The documents also contain the factors that the EPA intends to evaluate in determining the boundaries for designated areas. These factors include: 1) air quality characterization via ambient monitoring or dispersion modeling results; 2) emissions-related data; 3) meteorology; 4) geography and topography; and 5) jurisdictional boundaries. To assist states and other interested parties in their efforts to characterize air quality through air dispersion modeling for sources that emit SO₂, the EPA released its most recent version of a draft document titled, “SO₂ NAAQS Designations Modeling Technical Assistance Document” (Modeling TAD) in August 2016.⁴

Readers of this chapter of this TSD should refer to the additional general information for the EPA's Round 3 area designations in Chapter 1 (Background and History of the Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard) and Chapter 2 (Intended Round 3 Area Designations for the 2010 1-Hour SO₂ Primary National Ambient Air Quality Standard for States with Sources Not Required to be Characterized).

² <https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf>. In addition to this TAD on modeling, the EPA also has released a technical assistance document addressing SO₂ monitoring network design, to advise states that have elected to install and begin operation of a new SO₂ monitoring network. See Draft SO₂ NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, February 2016, <https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf>.

As specified by the March 2, 2015, court order, the EPA is required to designate by December 31, 2017, all “remaining undesignated areas in which, by January 1, 2017, states have not installed and begun operating a new SO₂ monitoring network meeting the EPA specifications referenced in EPA’s” SO₂ DRR (80 FR 51052). The EPA will therefore designate by December 31, 2017, areas of the country that are not, pursuant to the DRR, timely operating the EPA-approved and valid new monitoring networks. The areas to be designated by December 31, 2017, include the areas associated with two sources in Mississippi meeting DRR emissions criteria that states have chosen to be characterized using air dispersion modeling, the areas associated with two sources in Mississippi for which air agencies imposed emissions limitations on sources to restrict their SO₂ emissions to less than 2,000 tons per year (tpy), sources that met the DRR requirements by demonstrating shut down of the source (1 of which is in Mississippi), and other areas not specifically required to be characterized by the state under the DRR.

Because many of the intended designations have been informed by available modeling analyses, this preliminary TSD is structured based on the availability of such modeling information. There is a section for each county for which modeling information is available. For some counties, multiple portions of the county have modeling information available and the section on the county is divided accordingly. The EPA reviewed the most recent available SO₂ air quality monitoring data in the Air Quality System (AQS) database for all areas for which modeling analyses are available. For modeled areas where air quality monitoring data is available in the county or nearby, a subsection discussing air quality monitoring data relevant to the area is included. For all other areas, air quality monitoring data was not available in or near the county, and this subsection is not included. Mississippi does not have any areas for which air quality monitoring indicates a violation of the SO₂ NAAQS. The remaining to-be-designated counties are then addressed together in Section 5.

The EPA does not plan to revise this TSD after consideration of state and public comment on our intended designation. A separate TSD will be prepared as necessary to document how we have addressed such comments in the final designations.

The following are definitions of important terms used in this document:

- 1) 2010 SO₂ NAAQS – The primary NAAQS for SO₂ promulgated in 2010. This NAAQS is 75 parts per billion (ppb), based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. See 40 CFR 50.17.
- 2) Design Value - a statistic computed according to the data handling procedures of the NAAQS (in 40 CFR part 50 Appendix T) that, by comparison to the level of the NAAQS, indicates whether the area is violating the NAAQS.
- 3) Designated nonattainment area – an area that, based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined either: (1) does not meet the 2010 SO₂ NAAQS, or (2) contributes to ambient air quality in a nearby area that does not meet the NAAQS.
- 4) Designated unclassifiable/attainment area – an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO₂ NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS; or

(2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.⁵

- 5) Designated unclassifiable area – an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO₂ NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.
- 6) Modeled violation – a violation of the SO₂ NAAQS demonstrated by air dispersion modeling.
- 7) Recommended attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as attainment.
- 8) Recommended nonattainment area – an area that a state, territory, or tribe has recommended that the EPA designate as nonattainment.
- 9) Recommended unclassifiable area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable.
- 10) Recommended unclassifiable/attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable/attainment.
- 11) Violating monitor – an ambient air monitor meeting 40 CFR parts 50, 53, and 58 requirements whose valid design value exceeds 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.
- 12) We, our, and us – these refer to the EPA.

⁵ The term “designated attainment area” is not used in this document because the EPA uses that term only to refer to a previous nonattainment area that has been redesignated to attainment as a result of the EPA’s approval of a state-submitted maintenance plan.

3. Technical Analysis for the Choctaw County Area

3.1. Introduction

The EPA must designate the Choctaw County, Mississippi, area by December 31, 2017, because the area has not been previously designated and Mississippi has not installed and begun timely operation of a new, approved SO₂ monitoring network, which meets the EPA specifications referenced in the EPA's SO₂ DRR, in the vicinity of any source in Choctaw County.

3.2. Air Quality Monitoring Data for the Choctaw County Area

The state does not have any existing SO₂ monitoring data in Choctaw County, Mississippi.

3.3. Air Quality Modeling Analysis for the Choctaw County Area Addressing Choctaw Generation Limited Partnership, LLP - Red Hills Generating Facility

3.3.1. Introduction

This section presents all the available air quality modeling information for a portion of Choctaw County, Mississippi, that includes Red Hills Generating Facility (Red Hills) (This portion of Choctaw County will often be referred to as “the Choctaw County area” within Section 3.2.) This area contains the following SO₂ source, principally the sources around which Mississippi is required by the DRR to characterize SO₂ air quality, or alternatively to establish an SO₂ emissions limitation of less than 2,000 tpy:

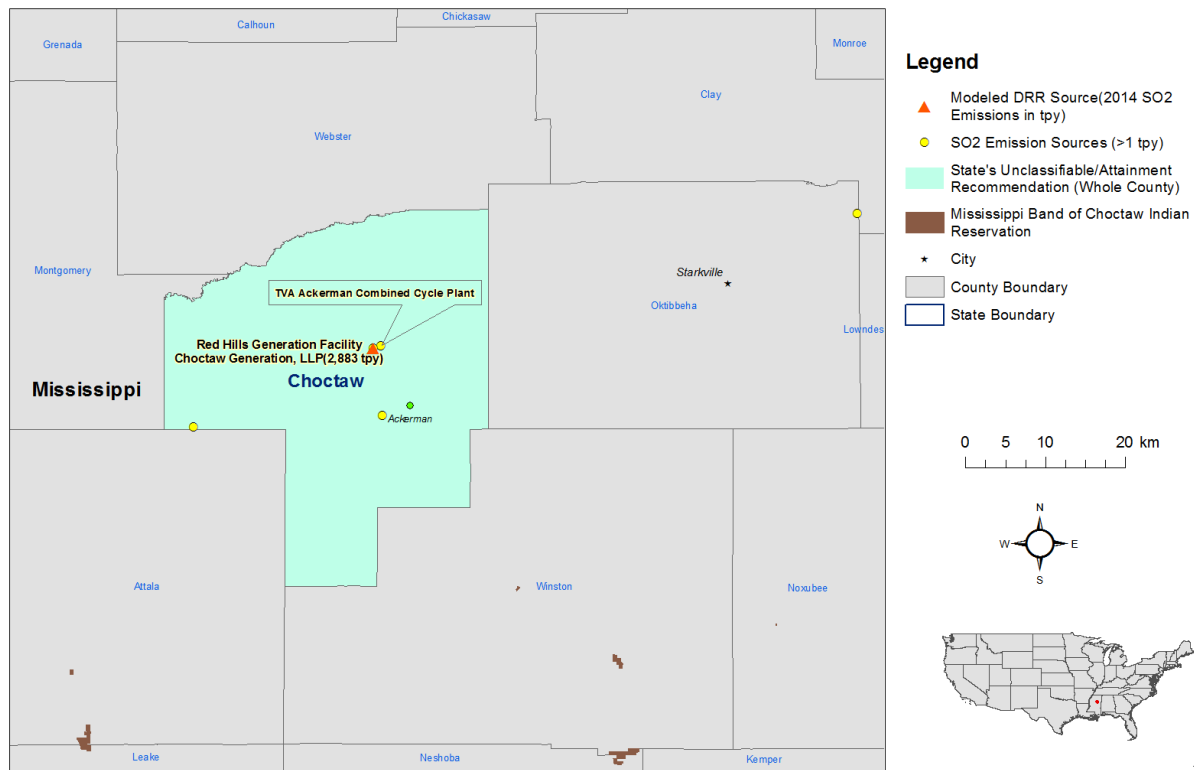
- The Red Hills facility emits 2,000 tons or more annually. Specifically, Red Hills emitted 2,883 tons of SO₂ in 2014. This source meets the DRR criteria and thus is on the SO₂ DRR Source list, and Mississippi has chosen to characterize it via modeling.

In its submission, Mississippi recommended that each county in the State be designated unclassifiable/attainment, including Choctaw County, based in part on an assessment and characterization of air quality impacts from this facility. This assessment and characterization was performed using air dispersion modeling software, i.e. AERMOD, analyzing actual emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA agrees with the State's recommendation for the area, and intends to designate the area as unclassifiable/attainment. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented. The area that the State has assessed via air quality modeling is located in Choctaw County, Mississippi, near Ackerman.

The Red Hills Generating Facility is a 514 megawatt (MW) electric power generation plant that operates two lignite-fired circulating fluidized bed boilers. As seen in Figure 1 below, the Red Hills Generating facility is located in Choctaw County, Mississippi, near Ackerman. Red Hills is

located in north-central Mississippi approximately 35 kilometers (km) west of Starkville, Mississippi. No other sources of SO₂ were included in the modeling analysis for Red Hills but three sources, Tennessee Valley Authority (TVA) Ackerman Combined Cycle Plant (formerly Quantum Choctaw Gas Generation Plant), Southeastern Timber Products, LLC and GenOn Wholesale Generation LP, Choctaw County Generating Station are shown in Figure 1. Also included in the figure is the State’s recommended area for the unclassifiable/attainment designation. The EPA’s intended unclassifiable/attainment designation boundary for the Choctaw County, Mississippi, area is not shown in this figure, but is shown in a figure in the section below that summarizes our intended designation.

Figure 1. Map of the Choctaw County, Mississippi Area Addressing Red Hills Generating Facility



The discussion and analysis that follows below will reference the Modeling TAD and the factors for evaluation contained in the EPA’s July 22, 2016, guidance and March 20, 2015, guidance, as appropriate. For this area, the EPA received and considered one modeling assessment from the State of Mississippi prepared by AECOM, contractor for the Red Hills Generating facility, and no assessments from other parties.

3.3.2. Modeling Analysis Provided by the State

3.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO₂ NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified.

The AERMOD modeling system contains the following components:

- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BPIPPRM: the building input processor
- AERMINUTE: a pre-processor to AERMET incorporating 1-minute automated surface observation system (ASOS) wind data
- AERSURFACE: the surface characteristics processor for AERMET
- AERSCREEN: a screening version of AERMOD

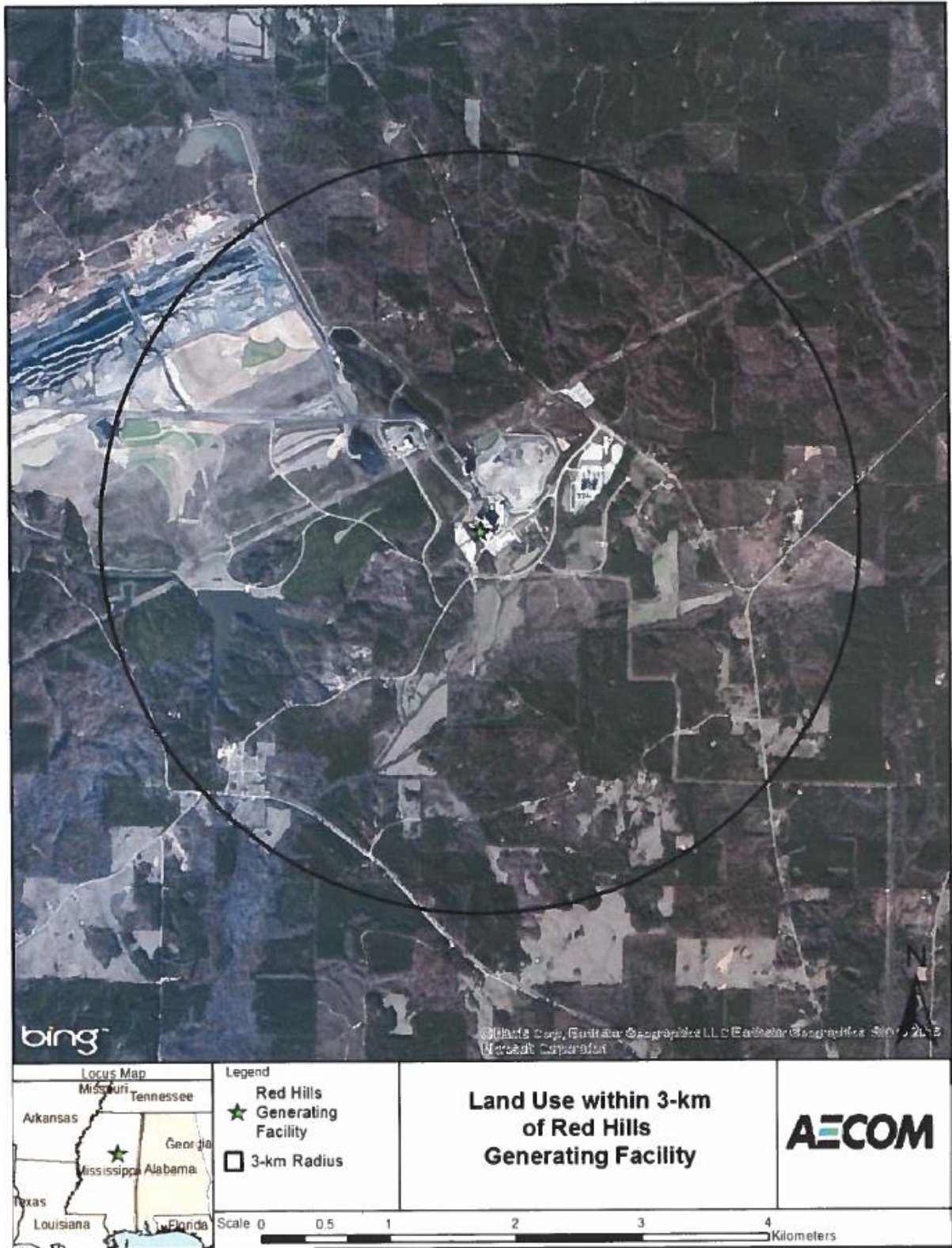
The State used AERMOD version 15181 with regulatory defaults. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

3.3.2.2. Modeling Parameter: Rural or Urban Dispersion

For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO₂ modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO₂ sources. Section 6.3 of the Modeling TAD details the procedures used to determine if a source is urban or rural based on land use or population density.

The EPA's recommended procedure for characterizing an area by prevalent land use is based on evaluating the dispersion environment within 3 km of the facility. According to the EPA's modeling guidelines, rural dispersion coefficients are to be used in the dispersion modeling analysis if more than 50 percent of the area within a 3 km radius of the facility is classified as rural. Conversely, if more than 50 percent of the area is urban, urban dispersion coefficients should be used in the modeling analysis. The State analyzed the land use types within a 3 km radius from the center of Red Hills as shown in Figure 2 and determined that the area is predominantly rural. For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model with rural dispersion coefficients or rural mode and based on the image in Figure 2 the EPA concurs with this assessment.

Figure 2. Land Use Map for the area around the Red Hills Generating Facility. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



3.3.2.3. Modeling Parameter: Area of Analysis (Receptor Grid)

The TAD recommends that the first step towards characterization of air quality in the area around a source or group of sources is to determine the extent of the area of analysis and the spacing of the receptor grid. Considerations presented in the Modeling TAD include but are not limited to: the location of the SO₂ emission sources or facilities considered for modeling; the extent of significant concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO₂ concentrations.

The source of SO₂ emissions subject to the DRR in this area is described in the introduction to this section. For the Choctaw County, Mississippi, area, the State indicated no large SO₂ background sources in the area that would need to be included in the modeling analysis for Red Hills. The TVA Ackerman Combined Cycle Plant (formerly Quantum Choctaw Gas Generation Plant), located less than 1 km east of Red Hills, burns natural gas and emitted less than 2 tpy according to the 2014 National Emissions Inventory (NEI). Additionally, there are no other SO₂ emitting sources within 50 km from Red Hills that are expected to have a significant impact within the area of analysis. Two other sources in Choctaw County include Southeastern Timber Products, LLC and GenOn Wholesale Generation LP, Choctaw County Generating Station located 8 km southeast and 21 southwest km of Red Hills respectively. These two sources cumulatively emitted approximately 9 tons in 2014. Therefore, the only emission sources modeled were the two lignite-fired circulating fluidized-bed boilers at Red Hills. Red Hills' annual actual SO₂ emissions between 2012 and 2014 are summarized in Table 2 below.

The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO₂ NAAQS exceedances in the area of analysis and any potential impact on SO₂ air quality from other sources in nearby areas. No other sources beyond 20 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis.

The grid receptor spacing for the area of analysis chosen by the State is as follows:

- From the center of the plant out to a distance of 3 km at 100 meter (m) spacing
- From 3 km to 5 km 200 m spacing
- From 5 km to 10 km at 500 m spacing
- From 10 km to 20 km at 1000 m spacing
- Receptors were also placed at 25 m intervals along the ambient air boundary.

The receptor network contained 8,017 receptors, and the network covered most of Choctaw County, northeastern Attala County, southern Webster County, and western Oktibbeha County.

Figures 3 and 4, included in the State's recommendation, show the state's chosen area of analysis surrounding the Red Hills Generating facility, as well as the receptor grid for the area of analysis.

Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in all locations that would be considered ambient air relative to the Red Hills Generating plant. The Red Hills facility is located on a single contiguous property and a fence surrounds the entire property except for a small opening at the lignite mine. The small opening to the mine is gated and access is controlled by facility personnel. Access to the general public is

restricted for the entire contiguous facility so the facility is not considered ambient air for the SO₂ modeling. Therefore, receptors were not placed in the area where the public does not have access (see Figure 3 below). The EPA concurs with the receptor network used for this modeling analysis.

Figure 3. Area of Analysis for the Choctaw County, Mississippi Area. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.

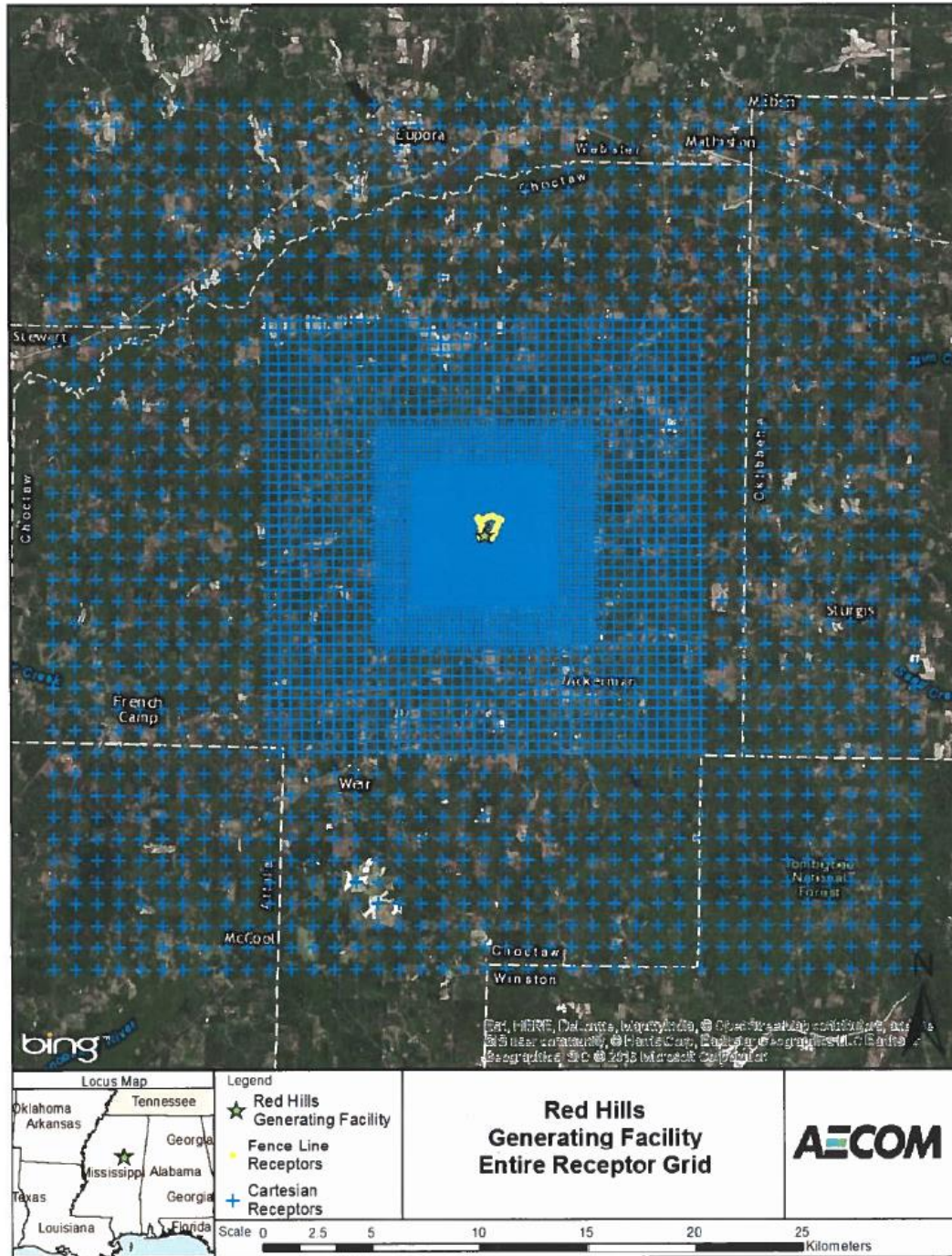


Figure 4. Receptor Grid for the Choctaw County, Mississippi Area. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



3.3.2.4. *Modeling Parameter: Source Characterization*

Section 6 of the Modeling TAD offers recommendations on source characterization including source types, use of accurate stack parameters, inclusion of building dimensions for building downwash (if warranted), and the use of actual stack heights with actual emissions or following Good Engineering Practice (GEP) policy with allowable emissions.

The Red Hills facility consists of two lignite-fired circulating fluidized bed boilers which exhaust to one common stack. The State characterized the sources within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the State used actual stack heights in conjunction with actual emissions. The State also adequately characterized the source's building layout and location, as well as the stack parameters, e.g., exit temperature, exit velocity, location, and diameter. Where appropriate, the AERMOD component BPIPPPRM was used to assist in addressing building downwash. The EPA concurs with this component of the State's modeling.

The Red Hills facility is the only DRR emission source located in Choctaw County within the 20 km area of analysis. The state believes this area of analysis adequately represents the area where maximum concentrations of SO₂ are expected and includes the only source which might contribute to those concentrations. For the Choctaw County, Mississippi, area, the State indicated no large SO₂ background sources in the area that would need to be included in the modeling analysis for Red Hills. The TVA Ackerman Combined Cycle Plant (formerly Quantum Choctaw Gas Generation Plant), located less than 1 km east of Red Hills, burns natural gas and emitted less than 2 tpy according to the 2014 NEI. Additionally, there are no other SO₂ emitting sources within 50 km from Red Hills that are expected to have a significant impact within the area of analysis. Two other sources in Choctaw County include Southeastern Timber Products, LLC and GenOn Wholesale Generation LP, Choctaw County Generating Station located 8 km southeast and 21 southwest km of Red Hills respectively. These two sources cumulatively emitted approximately 9 tons in 2014. Therefore, the only emission sources modeled were the two lignite-fired circulating fluidized-bed boilers at Red Hills. Red Hills' annual actual SO₂ emissions between 2012 and 2014 are summarized in Table 2 below.

3.3.2.5. *Modeling Parameter: Emissions*

The EPA's Modeling TAD notes that for the purpose of modeling to characterize air quality for use in designations, the recommended approach is to use the most recent 3 years of actual emissions data and concurrent meteorological data. However, the TAD also indicates that it would be acceptable to use allowable emissions in the form of the most recently permitted (referred to as potential to emit [PTE] or allowable) emissions rate that is federally-effective and enforceable.

The EPA believes that continuous emissions monitoring systems (CEMS) data provide acceptable historical emissions information, when they are available. These data are available for many electric generating units. In the absence of CEMS data, the EPA's Modeling TAD highly encourages the use of AERMOD's hourly varying emissions keyword HOUREMIS, or through the use of AERMOD's variable emissions factors keyword EMISFACT. When choosing one of

these methods, the EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s).

In certain instances, states and other interested parties may find that it is more advantageous or simpler to use PTE rates as part of their modeling runs. For example, where a facility has recently adopted a new federally-enforceable emissions limit or implemented other federally-enforceable mechanisms and control technologies to limit SO₂ emissions to a level that indicates compliance with the NAAQS, the state may choose to model PTE rates. These new limits or conditions may be used in the application of AERMOD for the purposes of modeling for designations, even if the source has not been subject to these limits for the entirety of the most recent 3 calendar years. In these cases, the Modeling TAD notes that a state should be able to find the necessary emissions information for designations-related modeling in the existing SO₂ emissions inventories used for permitting or state implementation plan (SIP) demonstrations. In the event that these short-term emissions are not readily available, they may be calculated using the methodology in Table 8-1 of Appendix W to 40 CFR Part 51 titled, “Guideline on Air Quality Models.”

As previously noted, the State included Red Hills and no other emitters of SO₂ within 20 km in the area of analysis. The State has chosen to model this facility using actual emissions. The facility in the State’s modeling analysis and its associated annual actual SO₂ emissions between 2012 and 2014 are summarized below in Table 2. A description of how the State obtained hourly emission rates is given below this table.

Table 2. Actual SO₂ Emissions Between 2012 – 2014 from the Red Hills Facility in the Choctaw County Area.

Facility Name	SO ₂ Emissions (tpy)		
	2012	2013	2014
Red Hills Generating Facility	3,037	3,159	2,883
Total Emissions from All Modeled Facilities in the State’s Area of Analysis	3,037	3,159	2,883

For Red Hills, the actual hourly emissions data were obtained from CEMS data provided by the facility. This data was incorporated in the dispersion modeling using the hourly varying emissions options (AERMOD keyword: HOUREMIS) to accurately represent the variability in emissions. Emissions from 2015 and 2016 were 3,027 and 2,799, respectively which is generally consistent with emissions from the period modeled.

As previously stated, Mississippi did not include any other sources in the modeling analysis and the EPA concurs with this assessment. According to the State there are no large SO₂ background sources in the area that would need to be included in the modeling analysis for Red Hills. As mentioned above, the TVA Ackerman facility, located less than 1 km east of Red Hills, burns natural gas and emitted less than 2 tpy according to 2014 NEI. Additionally, there are no other SO₂ emitting sources within 50 km of Red Hills that are expected to impact the area of analysis. Therefore, the only emission sources modeled were the two lignite-fired circulating fluidized-bed boilers at Red Hills.

3.3.2.6. *Modeling Parameter: Meteorology and Surface Characteristics*

As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of the data is determined based on: 1) the proximity of the meteorological monitoring site to the area under consideration, 2) the complexity of terrain, 3) the exposure of the meteorological site, and 4) the period of time during which data are collected. Sources of meteorological data include National Weather Service (NWS) stations, site-specific or onsite data, and other sources such as universities, Federal Aviation Administration (FAA), and military stations.

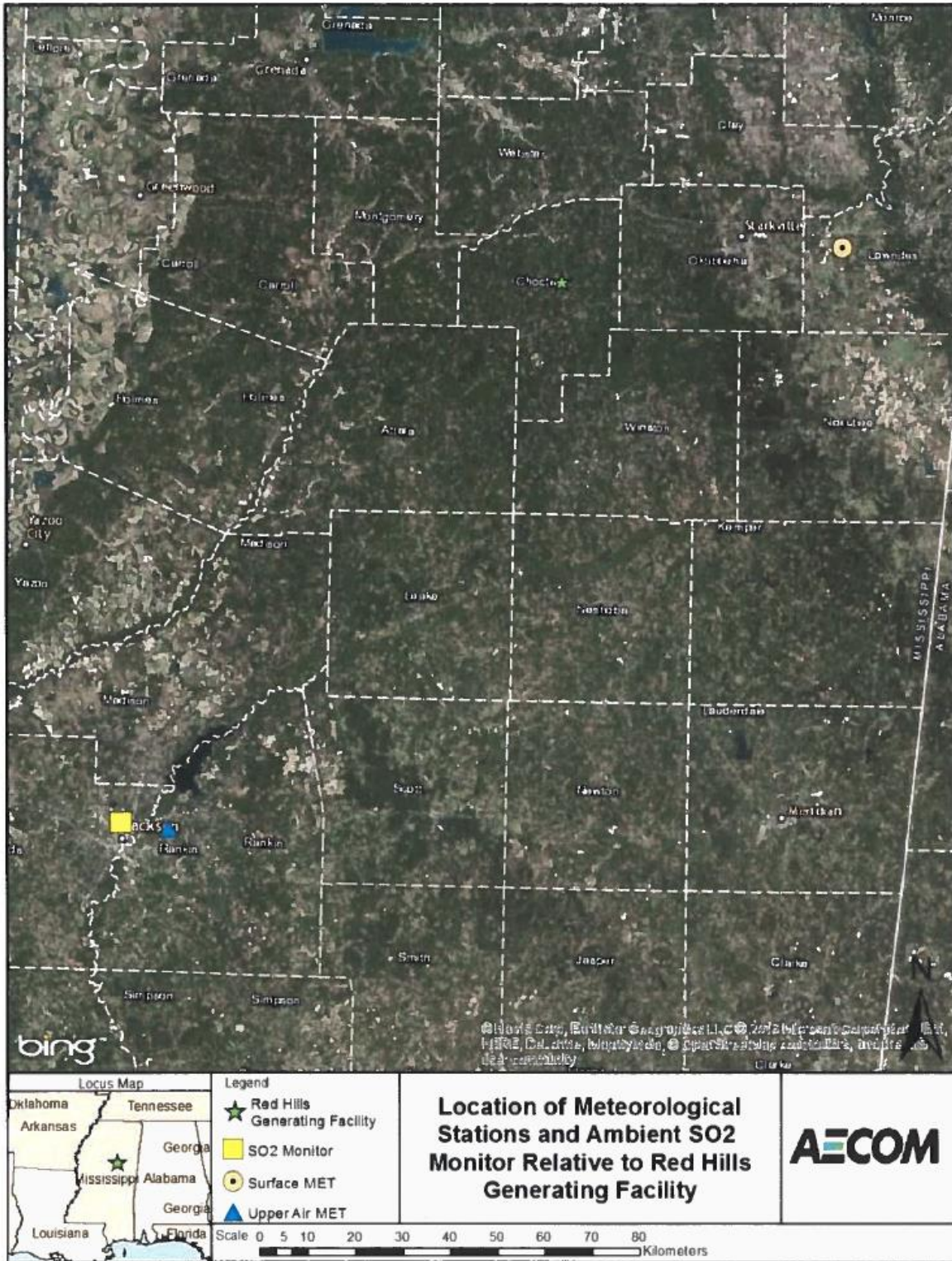
For the area of analysis for the Choctaw County area, the State selected the surface meteorology from the Golden Triangle Regional Airport NWS station in Columbus, Mississippi, located at 33.450 N, 88.583 W and coincident upper air observations from Jackson Thompson Field, a different NWS station, located in Jackson, MS, at 32.32 N, 98.08 W as best representative of meteorological conditions within the area of analysis.

The State used AERSURFACE version 13016 using data from Golden Triangle Regional Airport to estimate the surface characteristics (albedo, Bowen ratio, and surface roughness [z_o]) of the area of analysis. Albedo is the fraction of solar energy reflected from the earth back into space, the Bowen ratio is the method generally used to calculate heat lost or heat gained in a substance, and the surface roughness is sometimes referred to as “ z_o .” The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for average conditions. Documentation of AERSURFACE data is provided on Mississippi Department of Environmental Quality’s (MDEQ’s) website.⁶

In the figure below, included in the State’s recommendation, the locations of these NWS stations are shown relative to the area of analysis.

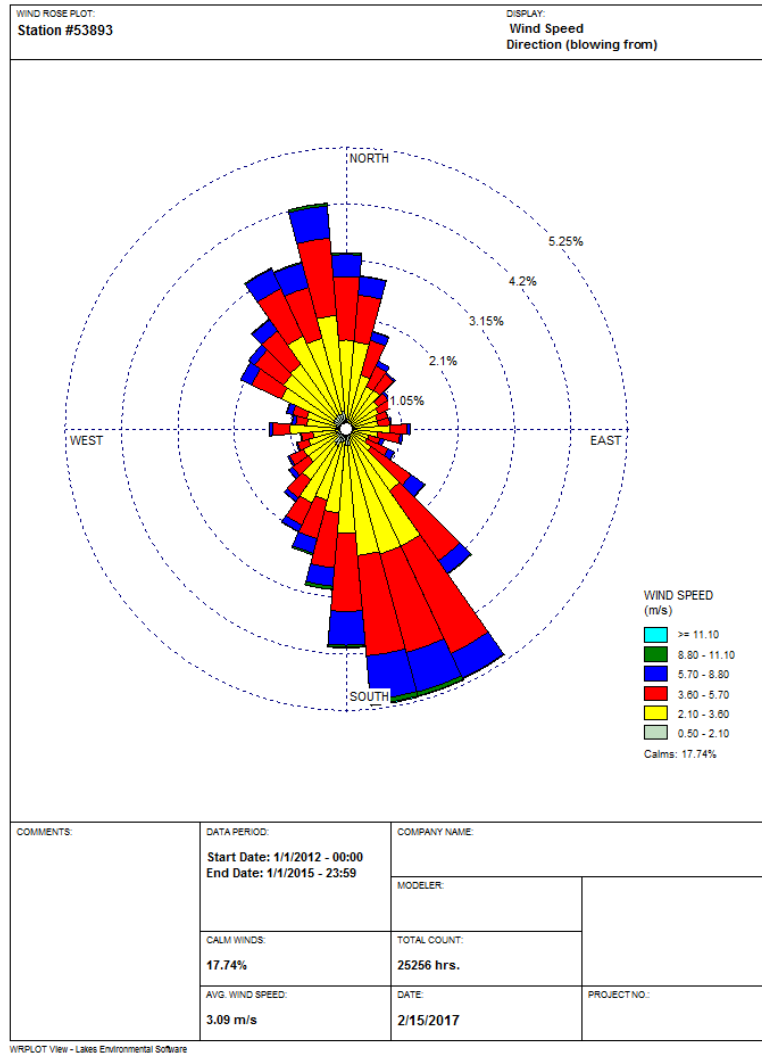
⁶[http://deq.ms.gov/MDEQ.nsf/pdf/epd_MetSupportDocument/\\$File/MS%20Met%20Support%20Document%202014.pdf?OpenElement](http://deq.ms.gov/MDEQ.nsf/pdf/epd_MetSupportDocument/$File/MS%20Met%20Support%20Document%202014.pdf?OpenElement)

Figure 5. Area of Analysis and the NWS stations in the Choctaw County Area. Source: Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



The EPA generated wind rose plots with “WRPLOTS View” utility program using state submitted pre-processed AERMET surface meteorology data for the Columbus, Mississippi NWS site. In Figure 6, the frequency and magnitude of wind speed and direction are defined in terms of from where the wind is blowing. Analysis of the NWS data indicate winds blow predominately from the south, southeast, and north, northwest directions at speeds of 3-11 meters/second.

Figure 6. Columbus, Mississippi NWS Cumulative Annual Wind Rose for Years 2012 – 2014



Meteorological data from the above surface and upper air NWS stations were used in generating AERMOD-ready files with the AERMET processor. The output meteorological data created by the AERMET processor is suitable for being applied with AERMOD input files for AERMOD modeling runs. The State followed the methodology and settings presented in Section 7 of the Modeling TAD in the processing of the raw meteorological data into an AERMOD-ready format, and used AERSURFACE to best represent surface characteristics.

3.3.2.7. *Modeling Parameter: Geography, Topography (Mountain Ranges or Other Air Basin Boundaries) and Terrain*

The terrain in the area of analysis is best described as flat without complex terrain. To account for these terrain changes, the AERMAP terrain program within AERMOD was used to specify terrain elevations for all the receptors. The source of the elevation data incorporated into the model is from the United States Geological Survey (USGS) National Elevation Database (NED). The EPA concurs with the processing of receptor elevation data used in this analysis.

3.3.2.8. *Modeling Parameter: Background Concentrations of SO₂*

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO₂ that are ultimately added to the modeled design values: 1) a “tier 1” approach, based on a monitored design value, or 2) a temporally varying “tier 2” approach, based on the 99th percentile monitored concentrations by hour of day and season or month. For this area of analysis, the state elected to use a “tier 1” approach. Data was obtained from the Jackson County, Mississippi, monitor for 2014-2016 (AQS Site: 28-049-0020). The single value of the background concentration for this area of analysis was determined by the State to be 39.3 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), equivalent to 15 ppb when expressed in 3 significant figures,⁷ and that value was incorporated into the final AERMOD results. The State’s method for determining the background concentration for this site is described below. The background concentration represents a 33-month consecutive design value. The Jackson County monitor has a segmented dataset which started December 2010. There is a 1-year gap in the dataset starting July 1, 2012 through June 30, 2013 when the monitor was moved 1.5 km west. Due to the 1-year data gap, Mississippi could not calculate a design value based on 3 consecutive years. However, the state considered the available data including calendar year design values for 2011, 2014 and 2015 and 33 consecutive months of data starting July 1, 2013 thru March 31, 2016 (creating 2-full non-calendar years and 3 quarters for third year). The three-year average for each data set resulted in 13 ppb for the calendar years and 15 ppb for the 33 consecutive months. Even though this methodology represents a deviation from the TAD, the most recent valid 3-year design value for the 2014-2016 period from the Jackson County monitor is 13 ppb which is slightly less than the value of 15 ppb used for background for the purposes of this modeling analysis. In addition, as shown in Section 3.2.2.9, the maximum concentration predicted by the modeling is less than half of the SO₂ NAAQS.

⁷ The SO₂ NAAQS level is expressed in ppb but AERMOD gives results in $\mu\text{g}/\text{m}^3$. The conversion factor for SO₂ (at the standard conditions applied in the ambient SO₂ reference method) is 1ppb = approximately 2.619 $\mu\text{g}/\text{m}^3$.

3.3.2.9. *Summary of Modeling Inputs and Results*

The AERMOD modeling input parameters for the Choctaw County area of analysis are summarized below in Table 3.

Table 3. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Choctaw County, Mississippi Area

Input Parameter	Value
AERMOD Version	15181
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	1
Modeled Structures	24
Modeled Fencelines	1
Total receptors	8,017
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Columbus, MS
NWS Station Upper Air Meteorology	Jackson, MS
NWS Station for Calculating Surface Characteristics	Columbus, MS
Methodology for Calculating Background SO ₂ Concentration	Variation of Tier 1 based on DV from 2014 – 2016 using AQS Site: 28-049-0020
Calculated Background SO ₂ Concentration	15 ppb

The results presented below in Table 3 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

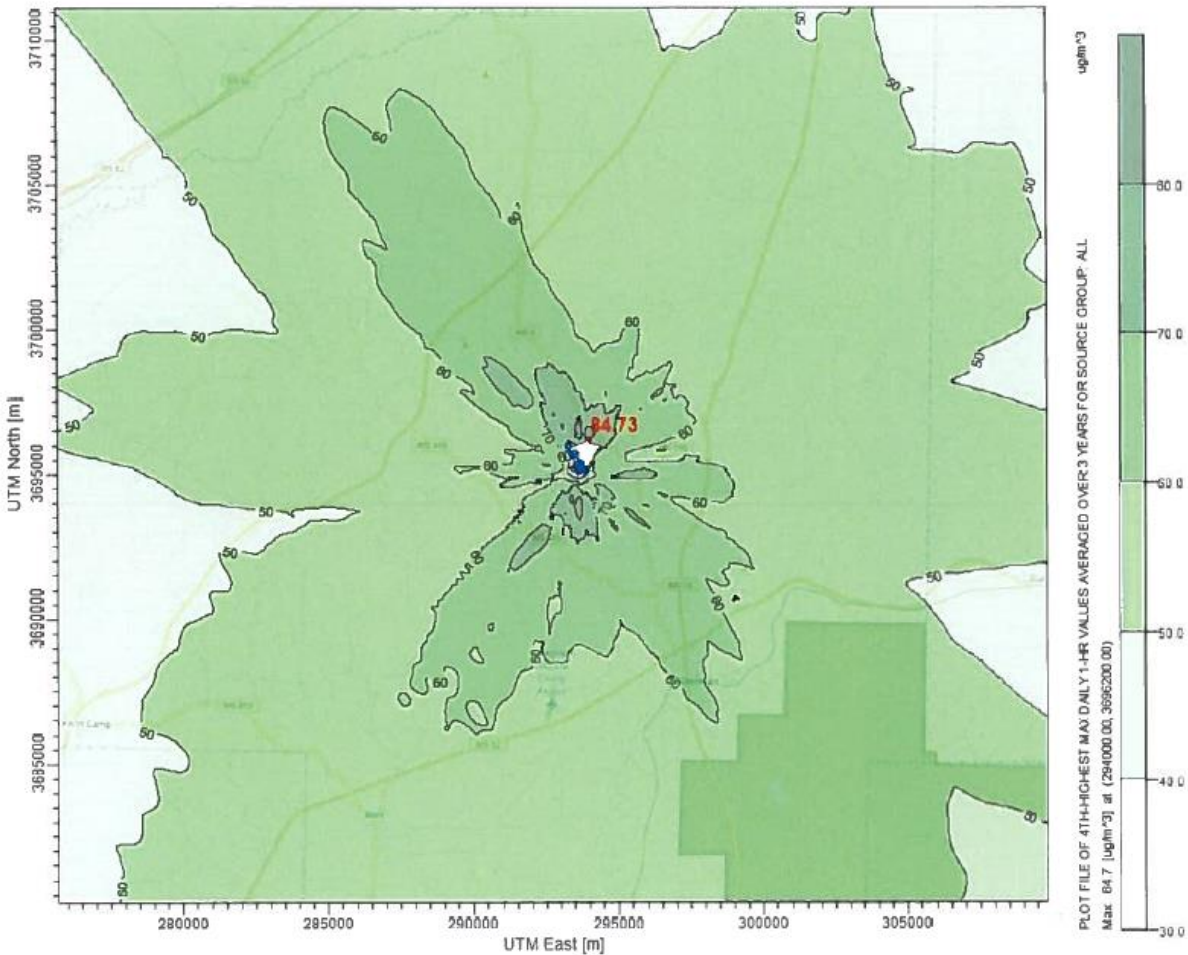
Table 4. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentration Averaged Over Three Years for the Area of Analysis for the Choctaw County, Mississippi Area

Averaging Period	Data Period	Receptor Location [UTM zone 16]		99 th percentile daily maximum 1-hour SO ₂ Concentration (µg/m ³)	
		UTM Easting (m)	UTM Northing (m)	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	294000	3696200	84.73	196.4*

*Equivalent to the 2010 SO₂ NAAQS of 75 ppb using a 2.619 µg/m³ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 84.73 µg/m³, equivalent to 32.4 ppb. This modeled concentration included the background concentration of SO₂, and is based on actual emissions from the facility. Figure 7 below was included as part of the State's recommendation, and indicates that the predicted value occurred to the northeast of the facility near the fenceline.

Figure 7. Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over Three Years for the Area of Analysis for the Choctaw County Area. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



The modeling submitted by the state does not indicate that the 1-hour SO₂ NAAQS is violated at the receptor with the highest modeled concentration. This modeled concentration includes the background concentration of SO₂, and is based on actual emissions from the facilities. Figure 7 below was included as part of the State’s recommendation, and indicates that the predicted value occurred directly east of Red Hills. The state’s receptor grid is also shown in the figure.

3.3.2.10. *The EPA’s Assessment of the Modeling Information Provided by the State*

The modeling analysis submitted by the State of Mississippi is consistent with the Modeling TAD with the exception of the background concentration used in the analysis. The background monitor in Jackson, MS, has incomplete data for the period analyzed (2012-2014) but has complete data for the 2014-16 period. The EPA notes that even though the methodology used by the State to develop a background concentration represents a deviation from the TAD, the most recent valid 3-year design value for the 2014-2016 period from the Jackson, MS monitor is 13 ppb which is slightly less than the value of 15 ppb used for background for the purposes of this modeling analysis. In addition, as shown in Section 3.2.2.9, the maximum concentration predicted by the modeling is less than half of the NAAQS.

3.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Choctaw County, Mississippi Area

These factors have been incorporated into the air quality modeling efforts and results discussed above. The EPA is giving consideration to these factors by considering whether they were properly incorporated and by considering the air quality concentrations predicted by the modeling.

3.5. Jurisdictional Boundaries in the Choctaw County Area

Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for the Choctaw County Area. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

Mississippi requested that every county in the State be designated unclassifiable/attainment including Choctaw County based on an assessment and characterization of air quality from the Red Hills generating station and other nearby sources. The State did not provide a specific boundary recommendation for the modeled area around the Red Hills facility. Choctaw County is bounded by Webster County to the north, Montgomery County to the east, Attala and Winston Counties to the south, and Okitbbehaha County to the west. Okitbbehaha County has an SO₂ source, Golden Triangle Regional Solid Waste Management Authority, located approximately 53 km east of Red Hills and 38 km from the Choctaw County line. This source emitted 7.29 tpy of SO₂ in 2014. Given the distance from Red Hills and Choctaw County and low SO₂ emissions this source is distant enough that impacts are reduced in terms of overlapping with those of Red Hills. According to the 2014 NEI, the remaining bordering counties have no SO₂ emitting sources over 7 tpy and Red Hills is the only SO₂ source in Choctaw County subject to the DRR.

According to the state, only one other SO₂ source, TVA Ackerman Combined Cycle Plant is located in Choctaw County. TVA Ackerman is located approximately 1 km east of Red Hills, burns natural gas and emitted less than 2 tpy of SO₂ in 2014. The EPA notes two other sources in Choctaw County, Southeastern Timber Products, LLC and GenOn Wholesale Generation LP, Choctaw County Generating Station located 8 km southeast and 21 southwest km of Red Hills

respectively. These two sources cumulatively emitted approximately 9 tons in 2014. Because of its low SO₂ emissions, all three sources mentioned above were not included in the modeling analysis for Red Hills. Within the State's 20 km area of analysis, only Red Hills facility's 2012-2014 actual SO₂ emissions were included in the modeled analysis. The state chose the 20 km area of analysis because it believes it adequately represents the area where maximum concentrations of SO₂ are expected and includes the only source which might contribute to those concentrations. According to the State, there are no "large" SO₂ background sources in the area that would need to be included in the modeling analysis for Red Hills, although the state did not specify what it meant by the term "large."

3.6. Other Information Relevant to the Designations for the Choctaw County Area

The EPA received no additional information regarding the Red Hills Generating Station or its surrounding area. The area does not include any existing nonattainment areas nor are there additional areas of analysis within Choctaw County, Mississippi.

3.7. The EPA's Assessment of the Available Information for the Choctaw County Area

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 84.73 µg/m³ or 32.4 ppb approximately 1 km south of Red Hills, which demonstrates compliance with the 2010 SO₂ NAAQS. This modeled concentration included the background concentration of SO₂, and is based on 2013-2015 actual SO₂ emissions from Red Hills Generating Station. The State assessed sources within a 20 km area of analysis in all directions because it believes it adequately represents the area where maximum concentrations of SO₂ are expected and includes the only source which might contribute to those concentrations. This receptor grid covers a majority of Choctaw County. According to the State, there are no "large" SO₂ background sources in the area that need to be included in the modeling for Red Hills, although the state did not specify what it means by the term "large." According to the 2014 NEI, the remaining three SO₂ emitting sources in Choctaw County have a cumulative SO₂ emissions total of 11 tpy. These include TVA Ackerman, Southeastern Timber Products, LLC and GenOn Wholesale Generation LP. Mississippi reported that TVA Ackerman, is located less than 1 km east of Red Hills, emitted less than 2 tpy according to the 2014 NEI and burns natural gas. Because of low SO₂ emissions, Mississippi did not include these sources in the modeling analysis for Red Hills and the EPA concurs with this assessment.

Choctaw County is bounded by Webster County to the north, Montgomery County to the east, Attala and Winston Counties to the south, and Okitbbehaha County to the west. Okitbbehaha County has an SO₂ source, Golden Triangle Regional Solid Waste Management Authority, located approximately 53 km east of Red Hills and 38 km from the Choctaw County line. This source emitted 7.29 tpy of SO₂ in 2014. Given the distance from Red Hills and Choctaw County and

low SO₂ emissions this source is distant enough that impacts are reduced in terms of overlapping with those of Red Hills. The remaining bordering counties have no SO₂ emitting sources over 7 tpy according to the 2014 NEI and Red Hills is the only SO₂ source in Choctaw County subject to the DRR. The EPA has reason to believe there are no additional sources in the counties bordering Choctaw County that are likely to cause or contribute to a violation of the SO₂ NAAQS in the modeled area.

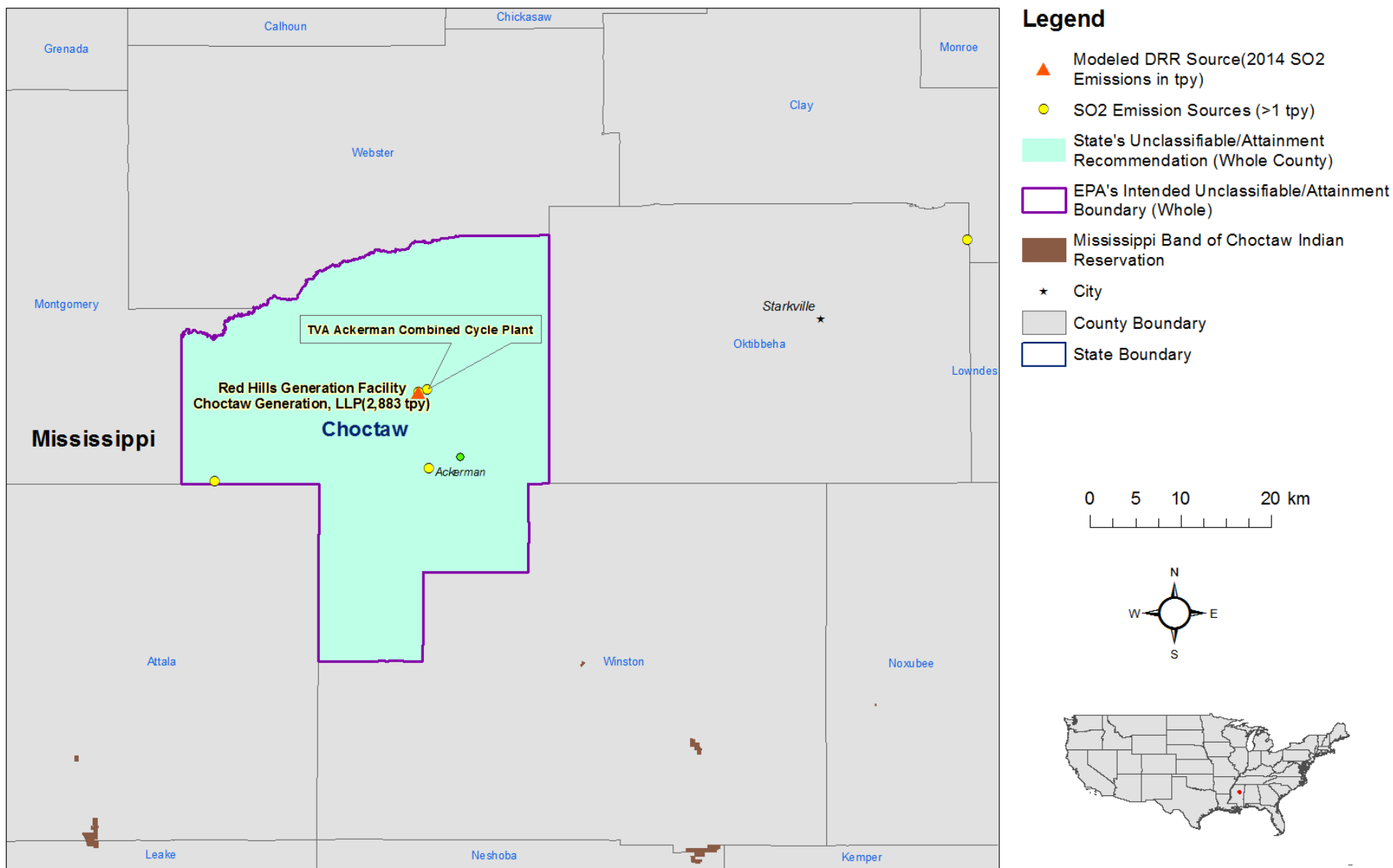
There are no SO₂ air quality monitors in Choctaw County or any border county for comparison to the air dispersion modeling. The EPA believes the modeling analysis for the Red Hills Generating Station adequately characterizes the area surrounding the source and was performed mostly in accordance with the EPA's Modeling TADs with the exception of the methodology used to develop background concentrations. However, as discussed in Section 3.2.2.8, even though this methodology represents a deviation from the TAD, the most recent valid 3-year design value for the 2014-16 period from the Jackson monitor is 13 ppb which is slightly less than the value of 15 ppb used for background for the purposes of this modeling analysis. In addition, as shown in Section 3.2.2.9, the maximum concentration predicted by the modeling is less than half of the NAAQS.

The EPA concurs with the State's assessment that there are no additional sources in Choctaw County or surrounding counties that could cause or contribute to a violation of the SO₂ NAAQS in the area of analysis. The EPA believes that our intended unclassifiable/attainment area of Choctaw County, in its entirety, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area. The EPA notes that Red Hills is the only SO₂ emitting source subject to the DRR in Choctaw County. Based on the modeling results provided by the State, including background levels of SO₂ and SO₂ emissions within Choctaw County, the EPA intends to designate in its entirety, Choctaw County as unclassifiable/attainment for the 1-hour SO₂ NAAQS.

3.8. Summary of Our Intended Designation for the Choctaw County Area

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate the Choctaw County, Mississippi, area unclassifiable/attainment for the 2010 SO₂ NAAQS because we believe the area is meeting the 2010 SO₂ NAAQS and does not contribute to a nearby area that does not meet the standard. The EPA notes there are no 2010 SO₂ nonattainment areas in Mississippi or any neighboring states and no expected nonattainment areas for this third round of designations. Furthermore, Red Hills in Choctaw County is over 100 km away from any Round 4 area being characterized by December 31, 2020 based on a newly deployed SO₂ monitor. Therefore, based on the available information including monitoring and modeling, the EPA believes the Choctaw County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS. Specifically, the boundaries are comprised of Choctaw County in its entirety. At this time, our intended designations for the state only apply to this area and the other areas presented in this TSD. Figure 8 shows the boundary of this intended designated area.

Figure 8. Boundary of the Intended Choctaw County, Mississippi Area Unclassifiable/Attainment Area



4. Technical Analysis for the Jackson County Area

4.1. Introduction

The EPA must designate the Jackson County, Mississippi, area by December 31, 2017, because the area has not been previously designated and Mississippi has not installed and begun timely operation of a new, approved SO₂ monitoring network, which meets EPA specifications referenced in EPA's SO₂ DRR, in the vicinity of any source in Jackson County.

4.2. Air Quality Monitoring Data for the Jackson County Area

This factor considers the SO₂ air quality monitoring data in the area of Jackson County. Mississippi, did not include monitoring data for this area, but stated in its January 10, 2017, letter: "SO₂ monitors in Mississippi have continued to meet the 2010 SO₂ NAAQS. Therefore, I recommend that all counties in Mississippi be designated as attainment/unclassifiable for the 2015 National Ambient Air Quality Standards for SO₂."

The EPA reviewed the available air quality monitoring data in the Air Quality System (AQS) database and found the following nearby data:

- The Pascagoula SO₂ monitor (AQS ID: 28-059-0006) is located at 30.378287, -88.53393 in Jackson County, within Pascagoula, Mississippi, 17.1 km south of Mississippi Power Company's Daniel Steam Electric Generating Plant (Plant Daniel). Data collected by this monitor indicates that the most recent SO₂ levels are below the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data from this monitor (2014-2016) indicate a 1-hr SO₂ design value of 21 ppb. However, this monitor was not located to characterize the maximum 1-hr SO₂ concentrations near Plant Daniel. Mississippi provided an air quality modeling analysis to characterize the maximum 1-hr SO₂ concentrations in the area (see section 4.3 below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there are no additional relevant data in AQS collected in or near Jackson County that could inform the intended designation action.⁸

4.3. Air Quality Modeling Analysis for the Jackson County Area Addressing Mississippi Power Company's Victor J. Daniel Steam Electric Generating Plant (Plant Daniel)

4.3.1. Introduction

Section 4.3 presents all the available air quality modeling information for a portion of Jackson County that includes Plant Daniel. (This portion of Jackson County will often be referred to as

⁸ The most recent SO₂ design values for all areas of the country are available at <https://www.epa.gov/air-trends/air-quality-design-values>.

“the Jackson County area” within this section 4.3.) This area contains the following SO₂ source, principally the sources around which Mississippi is required by the DRR to characterize SO₂ air quality, or alternatively to establish an SO₂ emissions limitation of less than 2,000 tons per year:

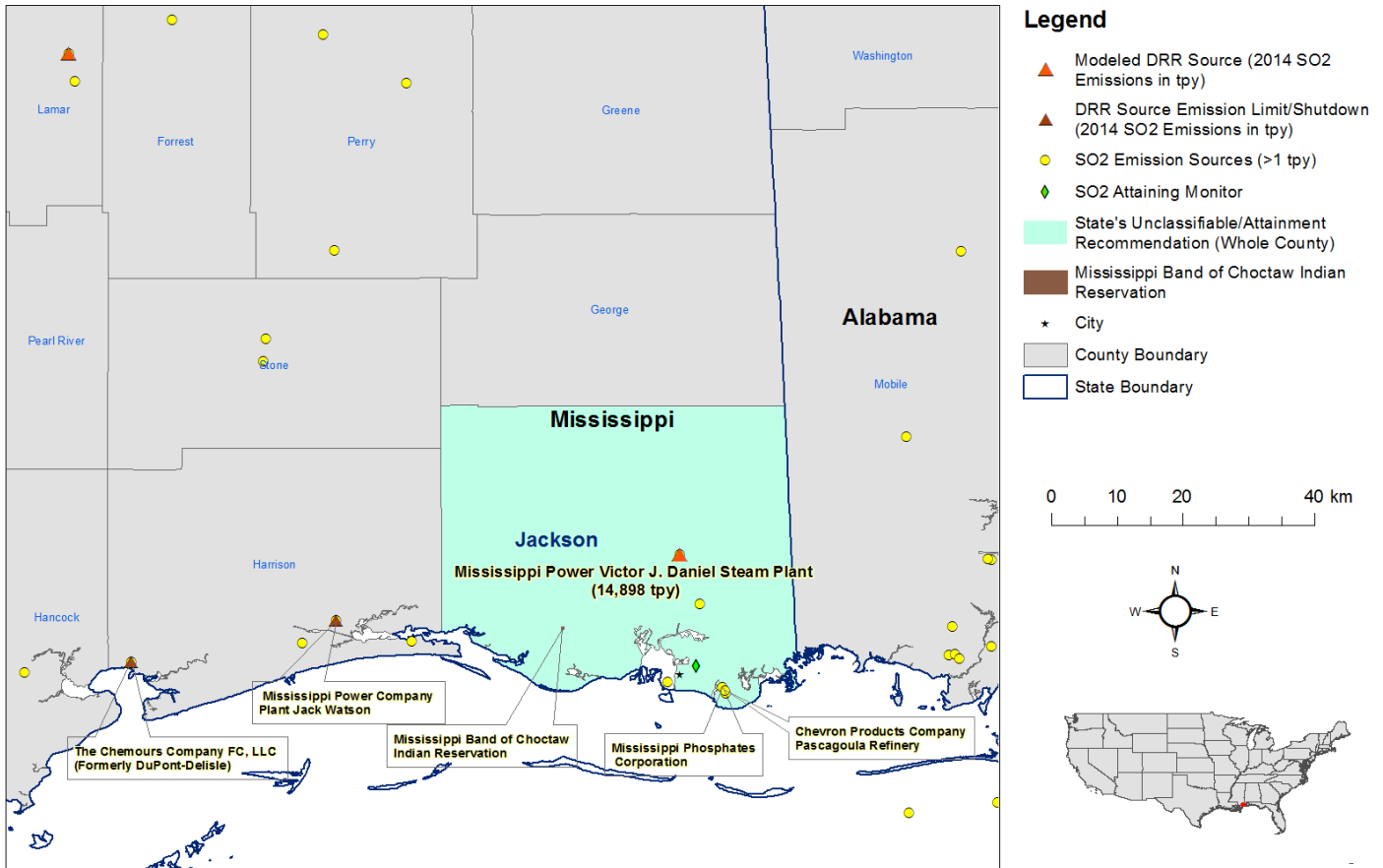
- The Plant Daniel facility emits 2,000 tons or more annually. Specifically, the facility emitted 14,898 tons of SO₂ in 2014. This source meets the DRR criteria and thus is on the SO₂ DRR Source list, and Mississippi has chosen to characterize it via modeling.

In its submission, Mississippi recommended that each county in the State be designated unclassifiable/attainment including Jackson County based in part on an assessment and characterization of air quality impacts from this facility. This assessment and characterization was performed using air dispersion modeling software, i.e. AERMOD, analyzing actual emissions. After careful review of the State’s assessment, supporting documentation, and all available data, the EPA agrees with the State’s recommendation for the area, and intends to designate the area as unclassifiable/attainment. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented.

The area the State has assessed via air quality modeling is located in Jackson County, Mississippi, in the southeastern portion of the State approximately 15-20 km north of Pascagoula as seen in Figure 9 below. Also included in Figure 9 are other nearby emitters of SO₂⁹ including Mississippi Phosphates Corporation and the Chevron Products Company, Pascagoula Refinery. These facilities are located approximately 21 km south of Plant Daniel and each facility emitted more than 100 tpy based on the 2011 (according to the State) and 2014 NEI. Also included in Figure 9 is the Mississippi Band of Choctaw Indians’ reservation approximately 19 km southwest of Plant Daniel and the State’s recommended boundary for the unclassifiable/attainment designation. The EPA’s intended designation boundary for the Jackson County, Mississippi, area is not shown in this figure, but is shown in a figure in the section below that summarizes our intended designation.

⁹ All other SO₂ emitters of 100 tpy or more (based on information in the 2011 and 2014 NEI are shown in Figure 9. If no sources not named previously are shown, there are no additional SO₂ emitters above this emission level in the vicinity of the named source(s).

Figure 9. Map of the Jackson County, Mississippi Area Addressing Plant Daniel



The discussion and analysis that follows below will reference the Modeling TAD and the factors for evaluation contained in the EPA’s July 22, 2016, guidance and March 20, 2015, guidance, as appropriate. For this area, the EPA received and considered one modeling assessment from the state of Mississippi, and no assessments from other parties.

4.3.2. Modeling Analysis Provided by the State

4.3.2.1. Model Selection and Modeling Components

The EPA’s Modeling TAD notes that for area designations under the 2010 SO₂ NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified. The AERMOD modeling system contains the following components:

- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BPIPPRM: the building input processor
- AERMINUTE: a pre-processor to AERMET incorporating 1-minute automated surface observation system (ASOS) wind data

- AERSURFACE: the surface characteristics processor for AERMET
- AERSCREEN: a screening version of AERMOD

The State used AERMOD version 15181 using regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

4.3.2.2. *Modeling Parameter: Rural or Urban Dispersion*

For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO₂ modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO₂ sources. Section 6.3 of the Modeling TAD details the procedures used to determine if a source is urban or rural based on land use or population density.

The EPA's recommended procedure for characterizing an area by prevalent land use is based on evaluating the dispersion environment within 3 km of the facility. According to the EPA's modeling guidelines, rural dispersion coefficients are to be used in the dispersion modeling analysis if more than 50 percent of the area within a 3 km radius of the facility is classified as rural. Conversely, if more than 50 percent of the area is urban, urban dispersion coefficients should be used in the modeling analysis. The State analyzed the land use types within a 3 km radius from the center of Plant Daniel as shown in Figure 10 and determined that the area is predominantly rural. For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model with rural dispersion coefficients or rural mode and based on the image in Figure 10 the EPA concurs with this assessment.

Figure 10. Land Use Map for the area around Plant Daniel Generating Facility. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



4.3.2.3. Modeling Parameter: Area of Analysis (Receptor Grid)

The TAD recommends that the first step towards characterization of air quality in the area around a source or group of sources is to determine the extent of the area of analysis and the spacing of the receptor grid. Considerations presented in the Modeling TAD include but are not limited to: the location of the SO₂ emission sources or facilities considered for modeling; the extent of significant concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO₂ concentrations.

For the Jackson County Area, the State assessed sources within or near the modeling receptor grid for potential inclusion in the modeling analysis. The modeling receptor grid extended 20 km from Plant Daniel in all directions. The State considered this more than sufficient to resolve the maximum impacts and any potential significant impact areas. This receptor grid covers a majority of Jackson County and a small portion of southwest Mobile County, Alabama (west of Mobile). The area captures approximately eight sources with low SO₂ emissions in Jackson County and no sources in Mobile County, AL. These eight sources cumulatively emitted less than 4 tpy of SO₂ according to the 2014 NEI and were not included in the modeling analysis for Plant Daniel.

The State also identified two other sources just outside the 20 km receptor grid, including Mississippi Phosphates Corporation and the Chevron Products Company, Pascagoula Refinery. Both facilities are located approximately 21 km south of Plant Daniel. According to the State Chevron and Mississippi Phosphates emitted 772 and 1,331 tpy of SO₂ respectively based on the 2011 NEI. The EPA notes, the 2014 NEI indicates Chevron emitted 653 tpy and Mississippi Phosphates emitted 662 tpy. More recent 2015 emissions inventory indicates Chevron emitted 810 tpy. According to the State, at approximately 20 km from Plant Daniel, it is unlikely that either source would interact with Plant Daniel to cause a modeled exceedance of the 1-hour SO₂ NAAQS and therefore, these sources were not explicitly modeled. However, because both sources are approximately 5 km southeast of the Pascagoula background monitor (AQS ID: 28-059-0006), these two source's potential impacts are accounted for by the ambient background monitor. The EPA concurs with this determination because the impact would be higher at the background monitor than it would be around Plant Daniel, which is 21 km away. Mississippi accounted for the sources consistent with appendix W in Section 8.3.3.b.iii., where we state "The number of nearby sources to be explicitly modeled in the air quality analysis is expected to be few except in unusual situations." The monitor is between the 2 facilities (i.e., Chevron and Mississippi Phosphates) and Plant Daniel and at 5 km is much closer to those 2 facilities than the 21 km they are from Plant Daniel. Therefore, it is an appropriate background monitor to account for the impacts of these 2 facilities. See section 4.3.2.8 for more information on background concentration. Additionally, seven smaller sources also located outside the 20 km receptor grid with a cumulative SO₂ emissions of 13 tpy are most likely captured by the background monitor due to their close proximity. The Mississippi Band of Choctaw Indians reservation is located 19 km southwest of Plant Daniel within the state's modeled analysis. According to the 2014 NEI, there are no SO₂ emitting sources within the Choctaw Indian reservation therefore, no sources within the reservation were explicitly included in the modeling analysis for Plant Daniel. Additionally, the Choctaw Indian Nation did not provide a designation recommendation for this round of SO₂ designations.

The grid receptor spacing for the area of analysis chosen by the state is as follows:

- From the center of the facility out to a distance of 3 km at 100 m spacing
- From 3 km to 5 km, 200 m spacing
- From 5 km to 10 km, 500 m spacing
- From 10 km to 20 km, 1000 m spacing
- Receptors placed at 25 m spacing around the ambient air boundary

The receptor network contained 7,805 receptors, and the network covered much of Jackson County, Mississippi, and a small portion of extreme southwest of Alabama west of Mobile.

Figures 11 and 12, included in the State's recommendation, show the State's chosen area of analysis surrounding the Plant Daniel, as well as the receptor grid for the area of analysis and the facility.

Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in all locations that would be considered ambient air relative to Plant Daniel. The State opted to apply a regular grid of receptors without excluding selected receptor locations. The only receptors excluded from the receptor network were those located in the plant property portion of Plant Daniel. No other receptors were excluded from the network of receptors described above. The EPA requested additional description of the ambient air boundary during review of the protocol for this facility but the information was not included in the final modeling report. However, Figure 15 below (included in the state's recommendation) suggests that the maximum concentrations are predicted to occur approximately 1 km south of Plant Daniel's boundary. Also, the stacks for the coal fired units are 350 feet tall which also suggests impacts further downwind well beyond the depicted ambient air boundary. The EPA concurs with the receptor network used for this modeling analysis.

Figure 11. Area of Analysis and Receptor Grid for the Jackson County, Mississippi Area
 Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.

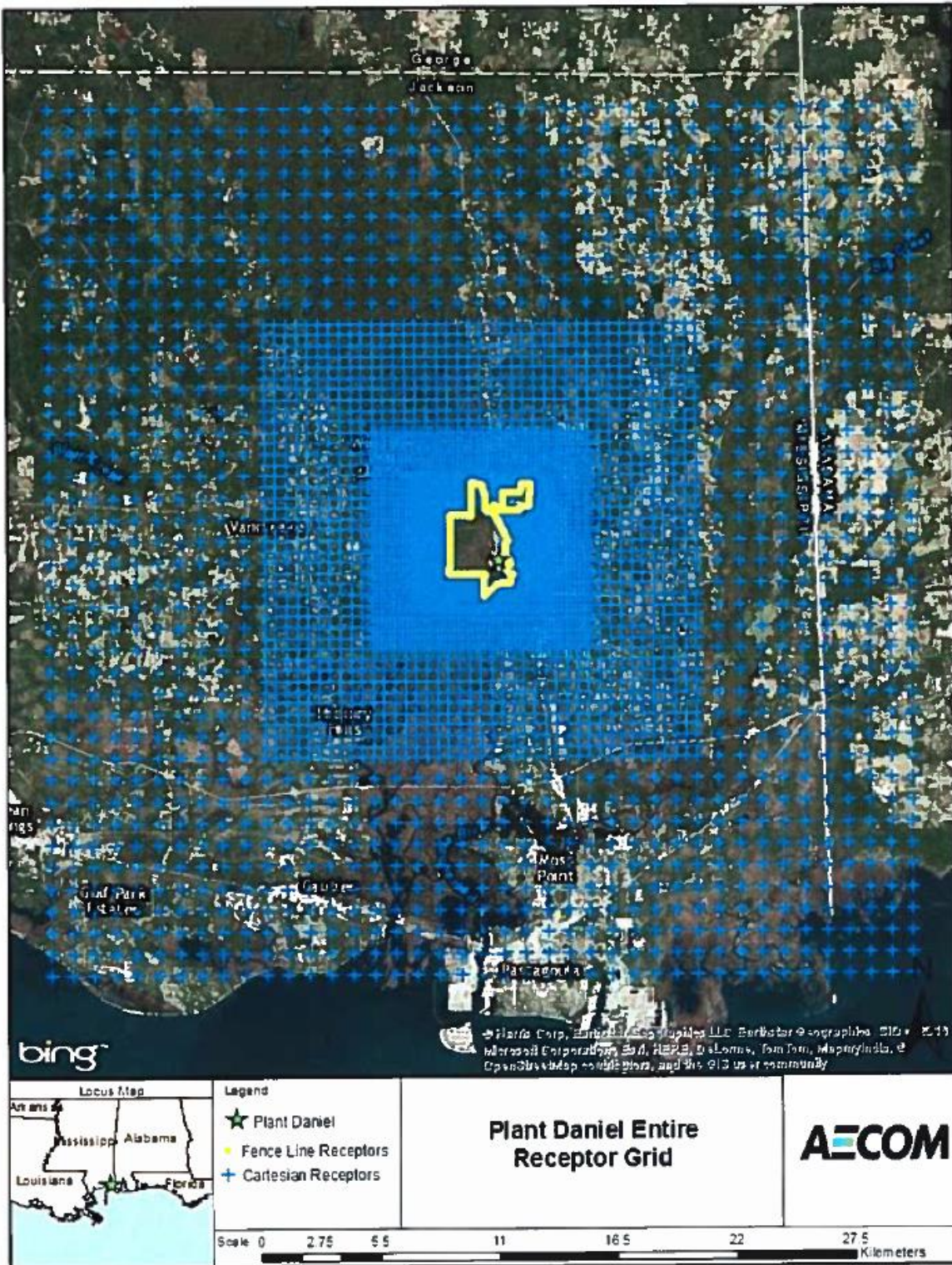
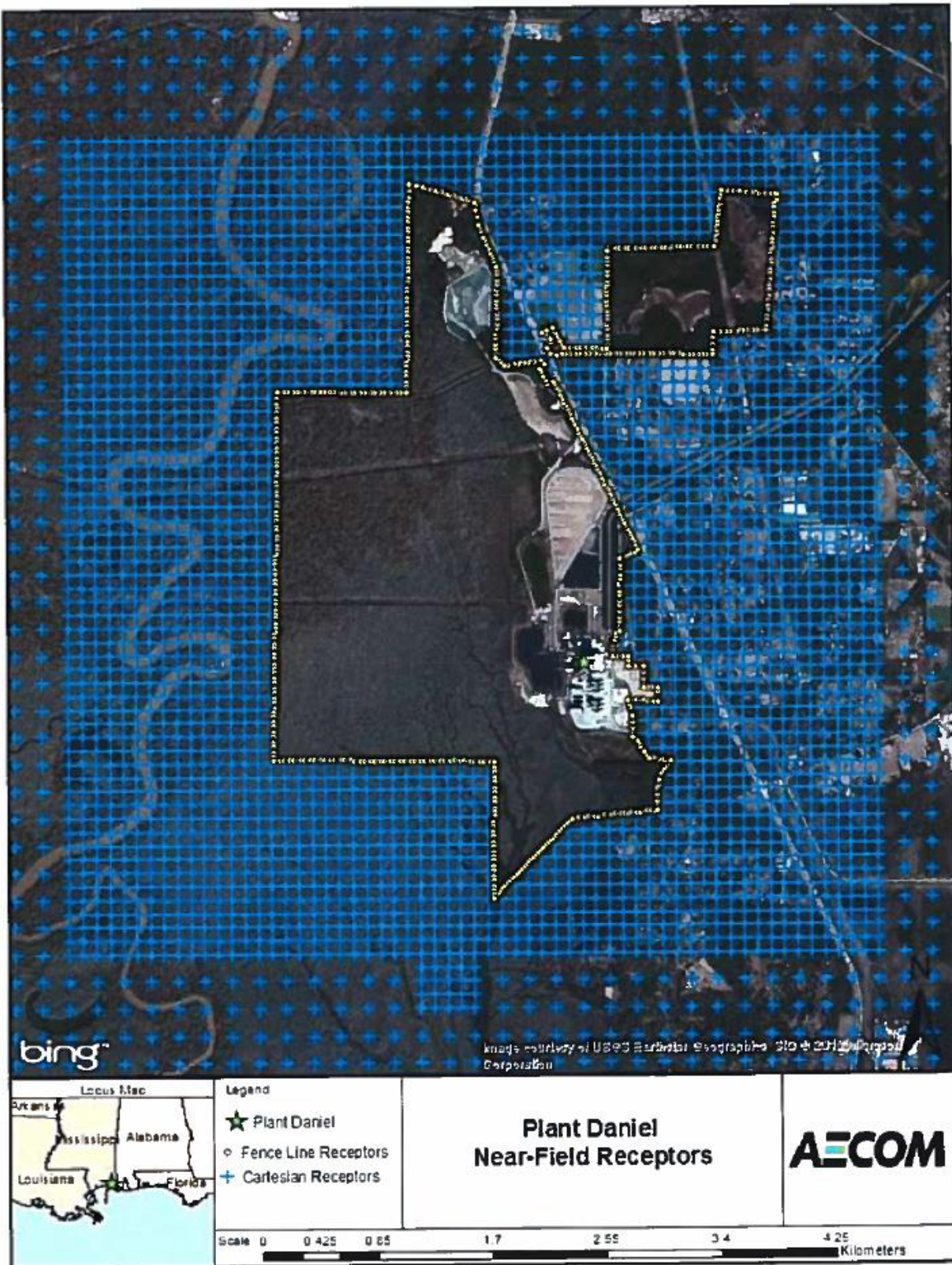


Figure 12. Plant Daniel Near-Field Receptors. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



4.3.2.4. Modeling Parameter: Source Characterization

Section 6 of the Modeling TAD offers recommendations on source characterization including source types, use of accurate stack parameters, inclusion of building dimensions for building downwash (if warranted), and the use of actual stack heights with actual emissions or following GEP policy with allowable emissions.

The only source the state explicitly modeled in this analysis was the primary DRR source, Plant Daniel Steam Electric Generating Plant. The only other sources with emissions of SO₂ greater than 600 tpy near the 20 km receptor grid (Mississippi Phosphates and Chevron Pascagoula Refinery) were accounted for by the SO₂ background monitor located in Pascagoula. Therefore, Plant Daniel is the only facility included in the modeling analysis.

The State characterized Plant Daniel within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the state used actual stack heights in conjunction with actual emissions. The State also adequately characterized the source's building layout and location, as well as the stack parameters, e.g., exit temperature, exit velocity, location, and diameter. Where appropriate, the AERMOD component BPIPPPRM was used to assist in addressing building downwash. The EPA concurs with this component of the State's modeling.

4.3.2.5. *Modeling Parameter: Emissions*

The EPA's Modeling TAD notes that for the purpose of modeling to characterize air quality for use in designations, the recommended approach is to use the most recent 3 years of actual emissions data and concurrent meteorological data. However, the TAD also indicates that it would be acceptable to use allowable emissions in the form of the most recently permitted (referred to as PTE or allowable) emissions rate that is federally enforceable and effective.

The EPA believes that CEMS data provide acceptable historical emissions information, when they are available. These data are available for many electric generating units. In the absence of CEMS data, the EPA's Modeling TAD highly encourages the use of AERMOD's hourly varying emissions keyword HOUREMIS, or through the use of AERMOD's variable emissions factors keyword EMISFACT. When choosing one of these methods, the EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s).

In certain instances, states and other interested parties may find that it is more advantageous or simpler to use PTE rates as part of their modeling runs. For example, where a facility has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO₂ emissions to a level that indicates compliance with the NAAQS, the state may choose to model PTE rates. These new limits or conditions may be used in the application of AERMOD for the purposes of modeling for designations, even if the source has not been subject to these limits for the entirety of the most recent 3 calendar years. In these cases, the Modeling TAD notes that a state should be able to find the necessary emissions information for designations-related modeling in the existing SO₂ emissions inventories used for permitting or SIP planning demonstrations. In the event that these short-term emissions are not readily available, they may be calculated using the methodology in Table 8-1 of Appendix W to 40 CFR Part 51 titled, "Guideline on Air Quality Models."

As previously noted, the state included Plant Daniel and no other emitters of SO₂ within the 20 km area of analysis. The state has chosen to model this facility using actual emissions. The facility in the State’s modeling analysis and their associated annual actual SO₂ emissions between 2012 and 2014 are summarized below. Emissions in 2015 were 8,412 tons and emissions in 2016 were 156 tons.

For Plant Daniel, the state provided annual actual SO₂ emissions between 2012 and 2014. This information is summarized in Table 5. For Plant Daniel, the actual hourly emissions data were obtained from CEMs. The EPA concurs with this component of the State’s modeling.

Table 5. Actual SO₂ Emissions Between 2012 – 2014 from Facilities in the Jackson County, Mississippi Area

Facility Name	SO ₂ Emissions (tpy)		
	2012	2013	2014
Plant Daniel	7,033	7,785	14,898
Total Emissions from All Modeled Facilities in the State’s Area of Analysis	7,033	7,785	14,898

4.3.2.6. *Modeling Parameter: Meteorology and Surface Characteristics*

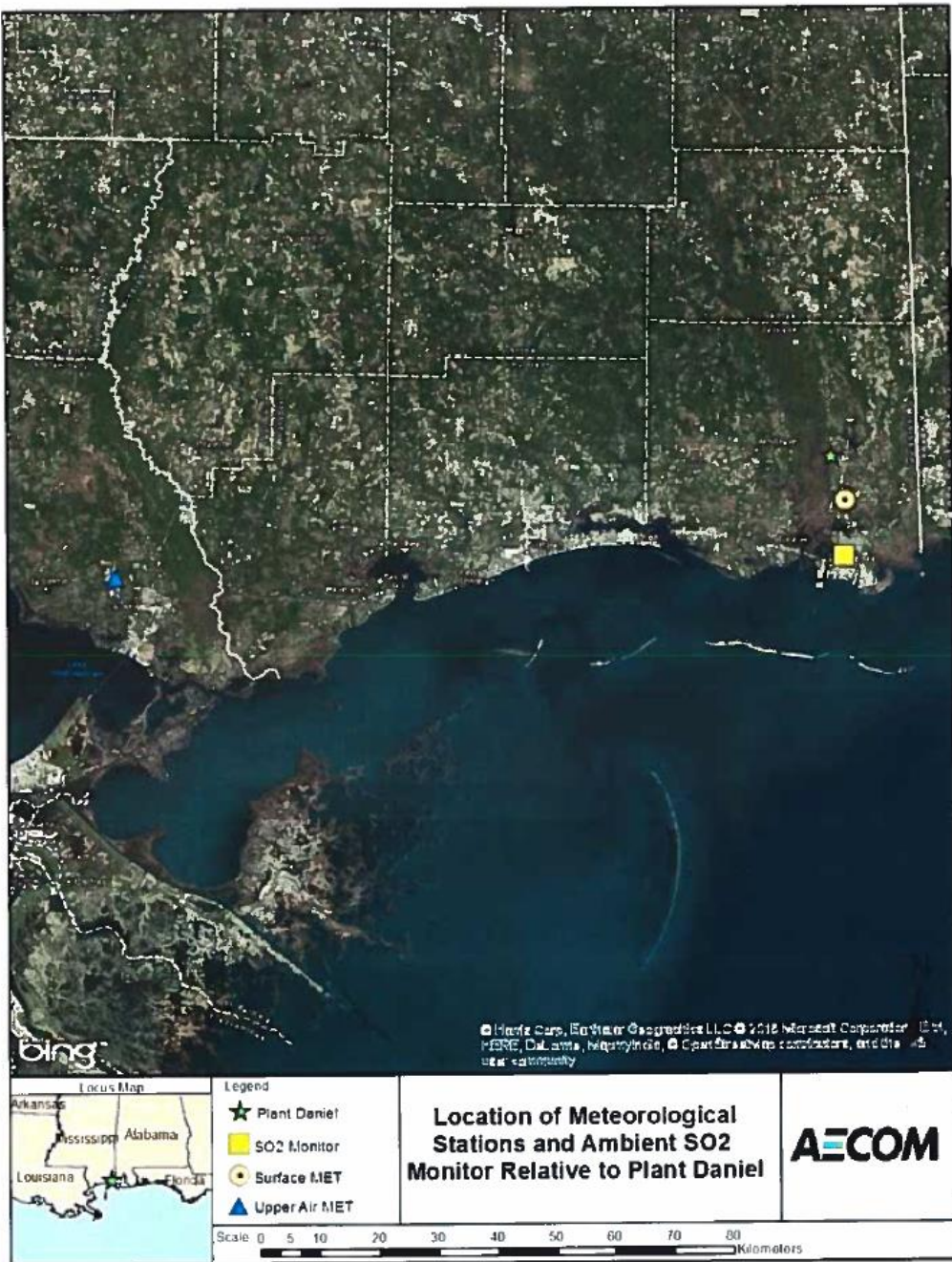
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of the data is determined based on: 1) the proximity of the meteorological monitoring site to the area under consideration, 2) the complexity of terrain, 3) the exposure of the meteorological site, and 4) the period of time during which data are collected. Sources of meteorological data include NWS stations, site-specific or onsite data, and other sources such as universities, FAA, and military stations.

For the area of analysis for the Jackson County area, the State selected the surface meteorology from the Trent Lott International Airport NWS station in Moss Point, Mississippi, located at 30.464 N, 88.532 W and coincident upper air observations from a different NWS station, in Slidell, LA, located at 30.33 N, 89.82 W, as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from the Trent Lott International Airport NWS in Moss Point, Mississippi to estimate the surface characteristics (albedo, Bowen ratio, and surface roughness [z_0]) of the area of analysis.¹⁰ Albedo is the fraction of solar energy reflected from the earth back into space, the Bowen ratio is the method generally used to calculate heat lost or heat gained in a substance, and the surface roughness is sometimes referred to as “ z_0 .” The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for average conditions. In the figure below, included in the State’s recommendation, the locations of these NWS stations are shown relative to the area of analysis.

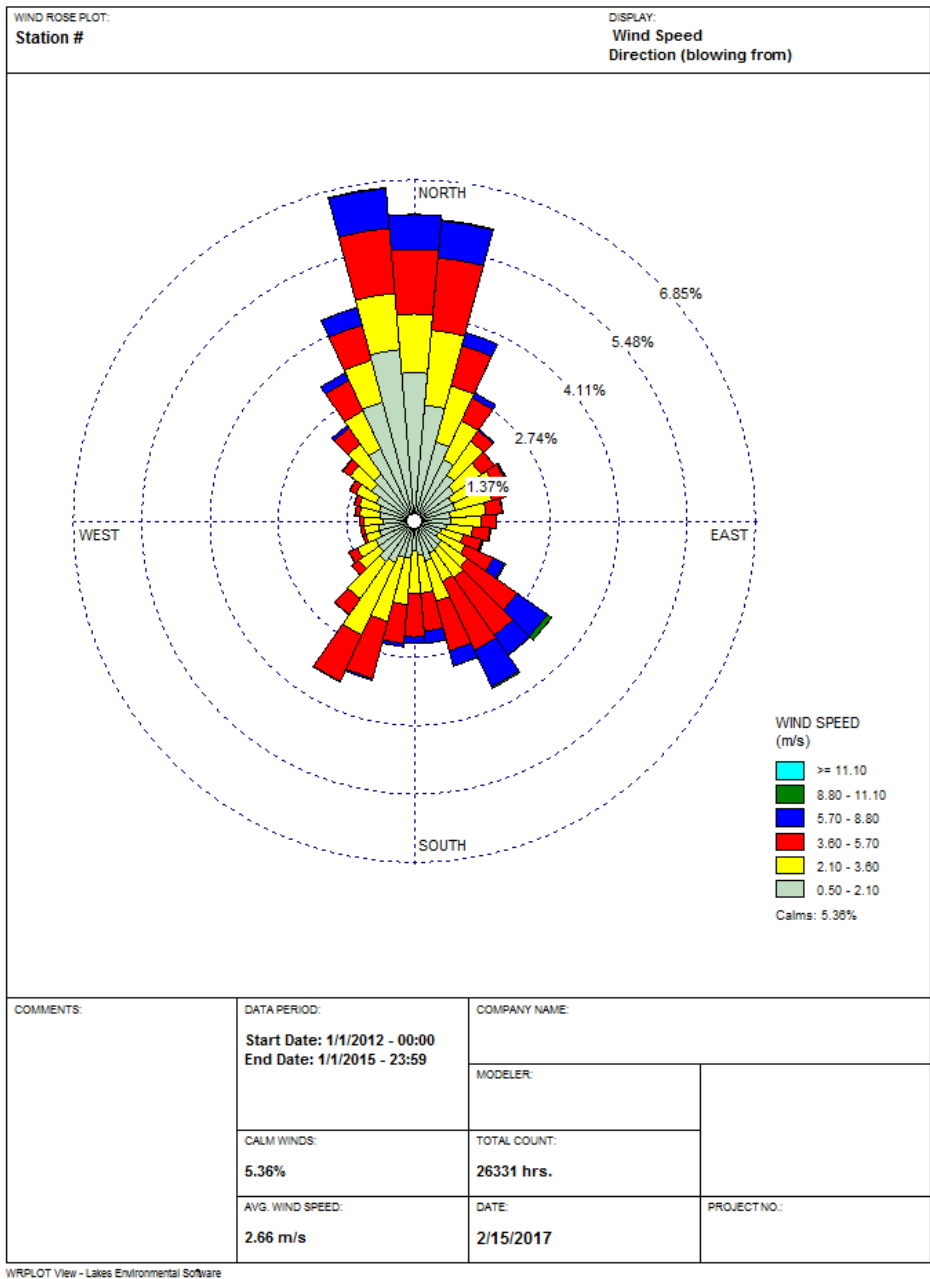
¹⁰ Documentation of AERSURFACE data is provided on Mississippi DEQ’s website: [http://deq.ms.gov/MDEQ.nsf/pdf/epd_MetSupportDocument/\\$File/MS%20Met%20Support%20Document%202014.pdf?OpenElement](http://deq.ms.gov/MDEQ.nsf/pdf/epd_MetSupportDocument/$File/MS%20Met%20Support%20Document%202014.pdf?OpenElement)

Figure 13. Area of Analysis and the Moss Point NWS station in the Jackson County, Mississippi Area. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



The EPA generated wind rose plots with “WRPLOTS View” utility program using state submitted pre-processed AERMET surface meteorology data for the Trent Lott International Airport NWS Station. In Figure 14, the frequency and magnitude of wind speed and direction are defined in terms of from where the wind is blowing. Analysis of the NWS data indicate winds blow predominately from the north and to a lesser extent, the southeast and southwest directions.

Figure 14. Moss Point, Mississippi NWS Cumulative Annual Wind Rose for Years 2012 – 2014



Meteorological data from the above surface and upper air NWS stations were used in generating AERMOD-ready files with the AERMET processor. The output meteorological data created by the AERMET processor is suitable for being applied with AERMOD input files for AERMOD modeling runs. The State followed the methodology and settings presented in Section 7 of the Modeling TAD in the processing of the raw meteorological data into an AERMOD-ready format, and used AERSURFACE to best represent surface characteristics.

Hourly surface meteorological data records are read by AERMET, and include all the necessary elements for data processing. However, wind data taken at hourly intervals may not always portray wind conditions for the entire hour, which can be variable in nature. Hourly wind data may also be overly prone to indicate calm conditions, which are not modeled by AERMOD. In order to better represent actual wind conditions at the meteorological tower, wind data of 1-minute duration was provided from the Trent Lott International Airport NWS but in a different formatted file to be processed by a separate preprocessor, AERMINUTE. These data were subsequently integrated into the AERMET processing to produce final hourly wind records of AERMOD-ready meteorological data that better estimate actual hourly average conditions and that are less prone to over-report calm wind conditions. This allows AERMOD to apply more hours of meteorology to modeled inputs, and therefore produce a more complete set of concentration estimates. As a guard against excessively high concentrations that could be produced by AERMOD in very light wind conditions, the state set a minimum threshold of 0.5 meters per second in processing meteorological data for use in AERMOD. In setting this threshold, no wind speeds lower than this value would be used for determining concentrations. This threshold was specifically applied to the 1-minute wind data. The EPA concurs with this component of the state's modeling.

4.3.2.7. Modeling Parameter: Geography, Topography (Mountain Ranges or Other Air Basin Boundaries) and Terrain

The terrain in the area of analysis is best described as simple. To account for these terrain changes, the AERMAP terrain program within AERMOD was used to specify terrain elevations for all the receptors. The source of the elevation data incorporated into the model is from the USGS NED. The EPA concurs with this component of the State's modeling.

4.3.2.8. Modeling Parameter: Background Concentrations of SO₂

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO₂ that are ultimately added to the modeled design values: 1) a "tier 1" approach, based on a monitored design value, or 2) a temporally varying "tier 2" approach, based on the 99th percentile monitored concentrations by hour of day and season or month. monitored concentrations by hour of day and season or month. For this area of analysis, the state elected to use the "tier 2" approach. Data was obtained from 2012-2014 for the Pascagoula, Mississippi, monitor (AQS Site: 28-059-0006) located approximately 17 km south of Plant Daniel. The background concentrations for this area of analysis were determined by the state to vary from 4.4 µg/m³,

equivalent to 1.7 ppb when expressed in 3 significant figures¹¹, to 49.8 µg/m³ (19 ppb). Table 6 below depicts the hour of day and seasonal background concentrations derived for this analysis. The EPA concurs with this component of the State’s modeling.

Table 6. Summary of Pascagoula, MS monitor 2012-2014 Season and Hour of Day Ambient Background (µg/m³) for the Jackson County, Mississippi Area. Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.

Hour of Day	Season 1	Season 2	Season 3	Season 4
	(Dec-Jan-Feb)	(Mar-Apr-May)	(Jun-Jul-Aug)	(Sep-Oct-Nov)
1	9.6	11.4	12.2	4.4
2	12.2	8.7	12.2	7.0
3	14.8	11.4	11.4	7.0
4	14.8	11.4	11.4	7.0
5	8.7	12.2	11.4	7.9
6	12.2	12.2	16.6	12.2
7	15.7	7.9	48.0	13.1
8	14.0	16.6	23.6	7.9
9	13.1	17.5	48.0	8.7
10	31.4	28.8	49.8	19.2
11	18.3	30.6	30.6	33.2
12	27.1	21.0	31.4	21.0
13	35.8	18.3	29.7	15.7
14	25.3	14.8	26.2	16.6
15	21.0	12.2	24.5	19.2
16	20.1	13.1	15.7	15.7
17	15.7	10.5	11.4	15.7
18	14.0	12.2	10.5	14.8
19	20.1	8.7	9.6	6.1
20	13.1	10.5	12.2	5.2
21	16.6	7.9	13.1	7.9
22	11.4	13.1	23.6	6.1
23	10.5	10.5	8.7	8.7
24	7.0	10.5	10.5	7.0

¹¹ The SO₂ NAAQS level is expressed in ppb but AERMOD gives results in µg/m³. The conversion factor for SO₂ (at the standard conditions applied in the ambient SO₂ reference method) is 1ppb = approximately 2.619 µg/m³.

4.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Jackson County area of analysis are summarized below in Table 7

Table 7. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Jackson County, Mississippi Area

Input Parameter	Value
AERMOD Version	15181 (Regulatory Default)
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	5
Modeled Structures	15
Modeled Fencelines	1
Total receptors	7,805
Emissions Type	Actual CEMS
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Trent Lott International Airport, Moss Point, MS
NWS Station Upper Air Meteorology	Slidell, LA
NWS Station for Calculating Surface Characteristics	Trent Lott International Airport, Moss Point, MS
Methodology for Calculating Background SO ₂ Concentration	Tier 2 approach using AQS site: 28-059-0006 for 2012 - 2014
Calculated Background SO ₂ Concentration	Hour of Day and Seasonal values ranging from 4.4 – 49.8 µg/m ³

The results presented below in Table 8 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

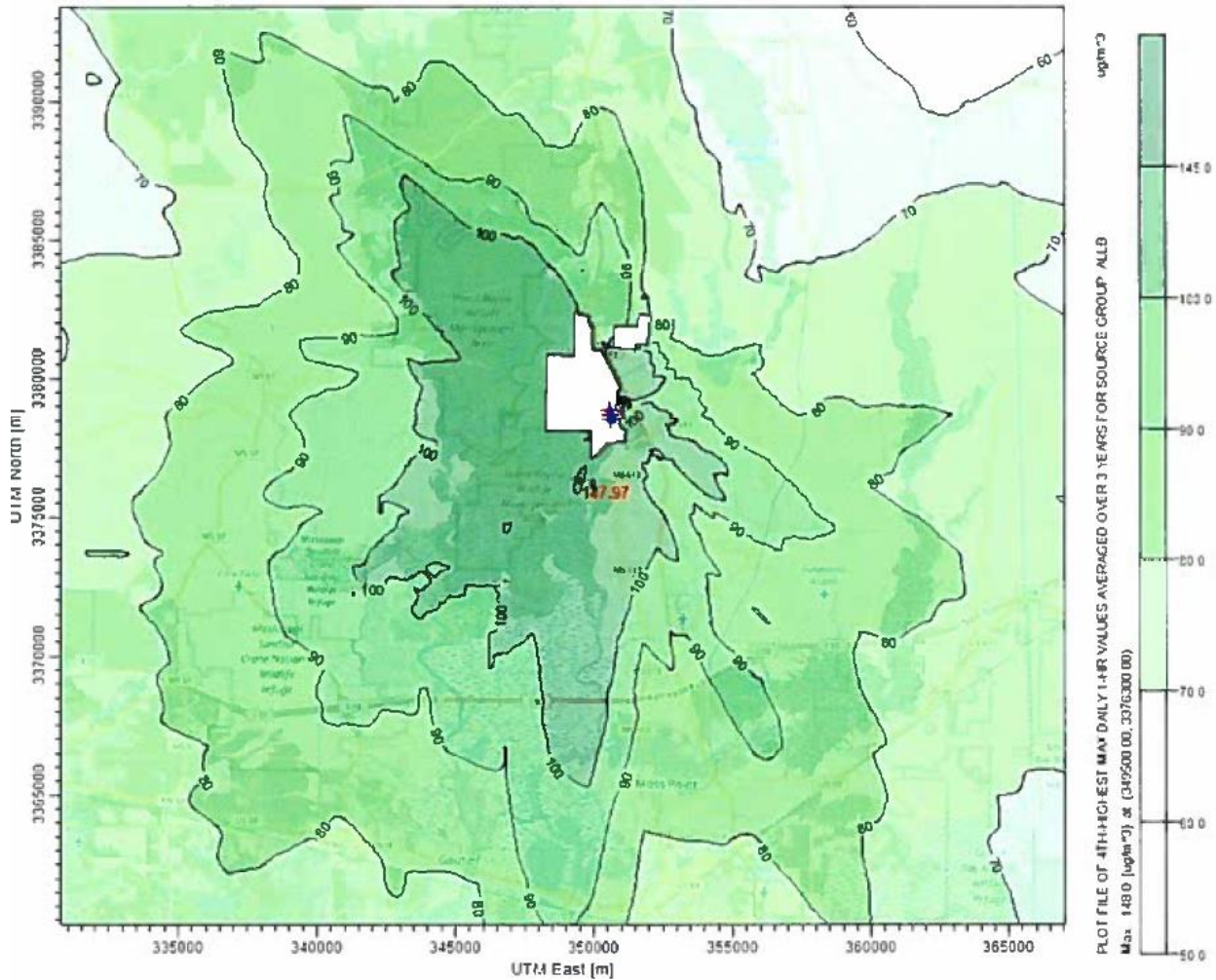
Table 8. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentration Averaged Over Three Years for the Area of Analysis for the Jackson County, Mississippi Area

Averaging Period	Data Period	Receptor Location [UTM zone 16]		99 th percentile daily maximum 1-hour SO ₂ Concentration (µg/m ³)	
		UTM Easting (m)	UTM Northing (m)	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	349500	3376300	147.97	196.4*

*Equivalent to the 2010 SO₂ NAAQS of 75 ppb using a 2.619 µg/m³ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 147.97 µg/m³, equivalent to 56.5 ppb. This modeled concentration included the background concentration of SO₂, and is based on actual emissions from the Plant Daniel facility. Figure 15 below was included as part of the State's recommendation, and indicates that the predicted value occurred approximately 200 meters south of Plant Daniel.

Figure 15. Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over Three Years for the Area of Analysis for the Jackson County, Mississippi Area.
Source: 1-Hour SO₂ NAAQS Designation Modeling Report prepared for Mississippi, December 2016.



The modeling submitted by the state does not indicate that the 1-hour SO₂ NAAQS is violated at the receptor with the highest modeled concentration.

4.3.2.10. *The EPA's Assessment of the Modeling Information Provided by the State*
 The EPA's assessment concludes that the modeling performed for Plant Daniel has been done in a manner consistent with the modeling TAD and the EPA concurs with the conclusion of this analysis that no violations of the 1-hour SO₂ NAAQS are predicted within the area of analysis. The results of this analysis should be conservative given that the background monitor used for this analysis is likely impacted by emissions from Plant Daniel.

4.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Jackson County Area

These factors have been incorporated into the air quality modeling efforts and results discussed above. The EPA is giving consideration to these factors by considering whether they were properly incorporated and by considering the air quality concentrations predicted by the modeling.

4.5. Jurisdictional Boundaries in the Jackson County Area³³

Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for Jackson County. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

Mississippi requested that every county in the State be designated unclassifiable/attainment including Jackson County based on an assessment and characterization of air quality from the Plant Daniel facility and other nearby sources. The State did not provide a specific boundary recommendation for the modeled area around Plant Daniel. Jackson County is bounded to the north by George County, Mobile County, Alabama to the east, the Gulf of Mexico to the south and Harrison and portions of Stone counties to the west.

MDEQ assessed nearby sources within a 20 km area of analysis from Plant Daniel in all directions and considered this sufficient to resolve the maximum impacts and any potential significant impact areas. This area of analysis covers a majority of Jackson County and a small portion of southwest Mobile County, Alabama (west of Mobile, AL). The area captures approximately eight additional sources in Jackson County and no sources in Mobile County, AL. These eight sources cumulatively emitted less than 4 tpy of SO₂ according to the 2014 NEI and were not included in the modeling analysis for Plant Daniel.

Two additional sources in Jackson County, Chevron Products Company, Pascagoula Refinery and Mississippi Phosphates are located outside the area of the analysis less than 1 km apart and approximately 21 km south of Plant Daniel. According to MDEQ, Chevron and Mississippi Phosphates emitted 1,331 and 772 tons, respectively, of SO₂ based on the 2011 NEI. More recent 2014 NEI reported Chevron and Mississippi Phosphates emitted 653 and 662 tons of SO₂ respectively. According to the state, these sources are not likely to interact with Plant Daniel to cause a modeled exceedance of the 1-hour SO₂ NAAQS given their distance from the DRR source and therefore, neither source was explicitly included in the modeling analysis. However, both sources are located approximately 5 km southeast of the SO₂ air quality monitor in Pascagoula, MS (AQS ID: 28-059-0006) that the state relied on for background concentrations. The remaining ten SO₂ emitting sources in Jackson County located outside the modeled area emitted a total of 17 tpy according to the 2014 NEI and none were explicitly modeled with Plant Daniel. The impact of these sources and any other sources were not explicitly modeled but are

accounted for by the Pascagoula SO₂ background monitor. The emission impacts from Chevron and Mississippi Phosphates are likely greater at the background monitor than they would be at Plant Daniel.

The Mississippi Band of Choctaw Indians reservation is located 19 km southwest of Plant Daniel within the state's area of analysis. According to the 2014 NEI, there are no SO₂ emitting sources within the Choctaw Indian reservation therefore, no sources within the reservation were explicitly included in the modeling analysis for Plant Daniel. Additionally, the Choctaw Indian Nation did not provide a designation recommendation for this round of SO₂ designations.

Harrison County has a total of 17 SO₂ emitting sources, according to the 2014 NEI, including two sources, Chemours Company FC LLC and Mississippi Power Plant Jack Watson, both of which are subject to the DRR and this third round of SO₂ designations. MDEQ chose to limit both sources SO₂ emissions to below 2,000 tpy through a federally enforceable permit in lieu of modeling or monitoring. Chemours and Plant Watson are located approximately 46 and 74 km from Plant Daniel respectively. The other remaining sources in Harrison County cumulatively emitted approximately 36 tpy of SO₂ according to the 2014 NEI. Stone County, MS, has a total of four sources that cumulatively emitted less than six tpy in 2014. George County, MS, also reported a total of four sources emitting less than one ton of SO₂ in 2014. Lastly, Mobile County, AL located east of Jackson County has a number of sources including Alabama Power James M. Barry Electric Generating Plant and Akzo Nobel Functional Chemicals, both of which are subject to the DRR and this third round of SO₂ designations and are approximately 75 km north of Plant Daniel. The portion of Mobile County included in the state's modeled analysis for Plant Daniel included no SO₂ emitting sources.

4.6. Other Information Relevant to the Designations for the Jackson County Area

The EPA received no additional information regarding Plant Daniel or its surrounding area. As mentioned in section 4.5 above, neighboring Harrison County west of Jackson County, includes two DRR sources both of which limited their SO₂ emissions to below 2,000 tpy in lieu of modeling or monitoring pursuant to the DRR. The EPA notes that there is no additional area of analysis in Jackson County nor does the county have any existing nonattainment areas.

4.7. The EPA's Assessment of the Available Information for the Jackson County Area

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 147.97 µg/m³ or 56.5 ppb 200 meters south of Plant Daniel which demonstrates compliance with the 2010 SO₂ NAAQS. This modeled concentration includes 2012-2014 actual SO₂ emissions from Plant Daniel only as well as background concentration from nearby sources within Jackson County. The EPA believes the modeling analysis for Plant Daniel adequately characterizes the area around the source and was

performed in accordance with the EPA's Modeling TAD. The EPA concurs with the conclusion of this analysis that no violations of the 1-hour SO₂ NAAQS are predicted within the Jackson County, Mississippi Area. The results of this analysis should be conservative given that the background monitor used for this analysis is likely impacted by emissions from Plant Daniel. There is one SO₂ air quality monitor in Jackson County in Pascagoula (AQS ID: 28-059-0006) approximately 17 km south of Plant Daniel that shows attainment of the 2010 SO₂ NAAQS with 2014-2016 air quality data. The EPA notes there are no 2010 SO₂ nonattainment areas in Mississippi or any neighboring states and no expected nonattainment areas for this third round of designations. Furthermore, Plant Daniels in Jackson County is over 100 km away from any Round 4 area being characterized by December 31, 2020 based on a newly deployed SO₂ monitor. Therefore, based on the available information including monitoring and modeling, the EPA believes the Jackson County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

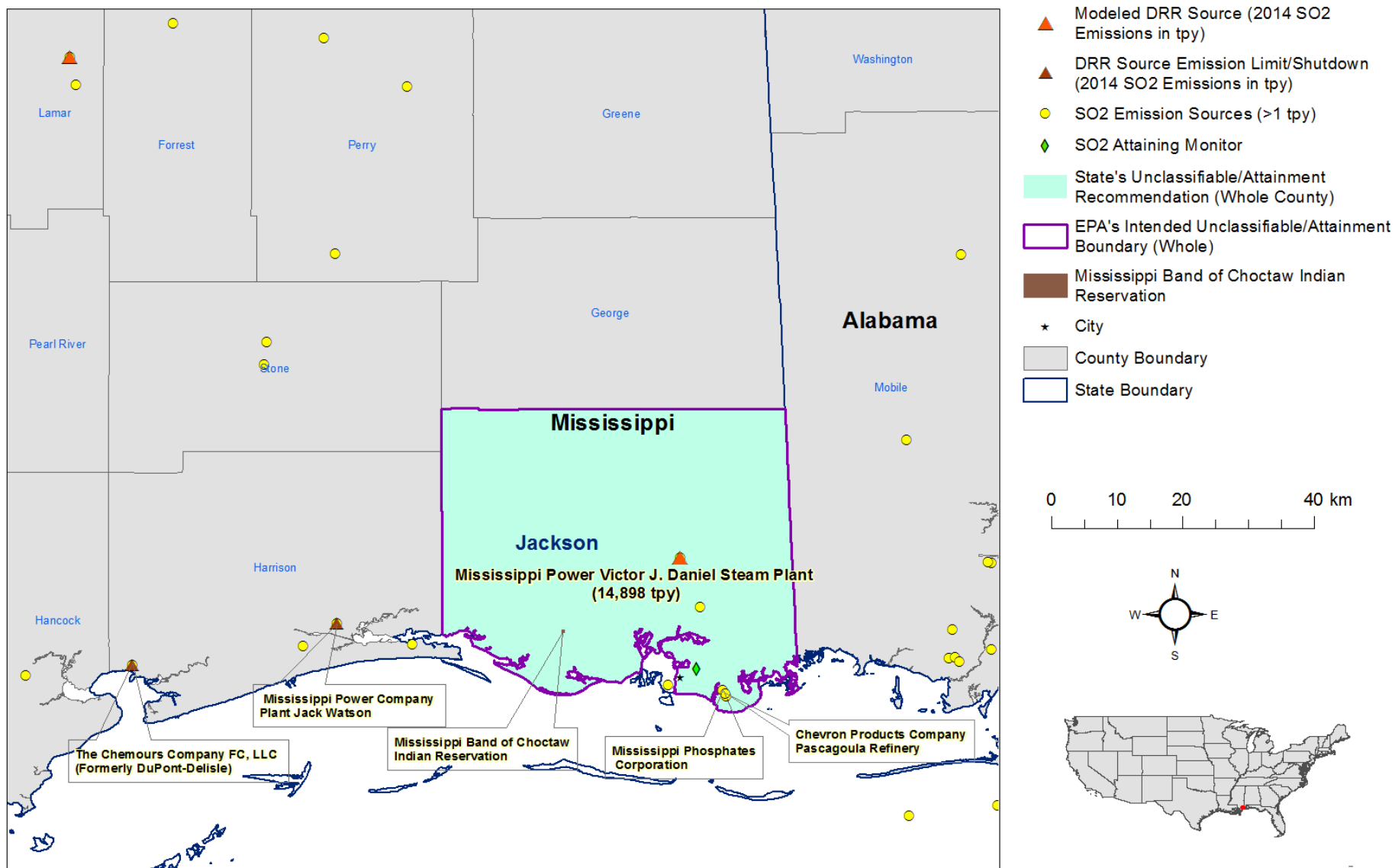
The State assessed sources within a 20 km area of analysis in all directions because it believes it adequately represents the area where maximum concentrations of SO₂ are expected and includes the only source which might contribute to those concentrations. This modeled area covers a majority of Jackson County and a small portion of southwest Mobile County, Alabama (west of Mobile, AL). According to the state there are no large SO₂ background sources in the area of analyses that would need to be included in the modeling analysis for Plant Daniel. Beyond the 20 km area of analysis the state identified two other sources in Jackson County, Mississippi Phosphates and Chevron-Pascagoula Refinery located approximately 21 km south of Plant Daniel. According to the State, these sources are not likely to interact with Plant Daniel to cause a modeled exceedance of the 1-hour SO₂ NAAQS given their distance from the DRR source. Furthermore, these sources and additional smaller facilities in Jackson County are within close proximity to the Pascagoula background SO₂ monitor, therefore, their potential impacts are accounted for in the modeled analysis. EPA

The EPA agrees that there are no additional sources in the counties bordering Jackson County that would likely cause or contribute to an exceedance of the SO₂ NAAQS in the receptor grid due to their low SO₂ emissions and distance from the Plant Daniel DRR source. The two DRR sources located in Harrison County, Chemours and Mississippi Power Plant Jack Watson, limited their SO₂ emissions to below 2,000 tpy (see section 5) and their distance from Plant Daniel indicates that they would not likely cause a modeled exceedance of the SO₂ standard. The EPA believes that our intended unclassifiable/attainment area, bounded by Jackson County in its entirety, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area. The EPA notes that Plant Daniel is the only SO₂ emitting source subject to the DRR in Jackson County. Based on the modeling results provided by the state, including background levels of SO₂ and SO₂ emissions within Jackson County, the EPA intends to designate, in its entirety, Jackson County as unclassifiable/attainment for the 1-hour SO₂ NAAQS. The EPA notes, that this intended boundary includes the Mississippi Band of Choctaw Indian reservation.

4.8. Summary of Our Intended Designation for the Jackson County Area

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate Jackson County as unclassifiable/attainment for the 2010 SO₂ NAAQS. Specifically, the boundaries are comprised of the entirety of Jackson County, including the Mississippi Band of Choctaw Indians reservation. At this time, our intended designations for the State only apply to this area and the other areas presented in this technical support document. Figure 16 shows the boundary of this intended designated area.

Figure 16. Boundary for the Intended Jackson County, Mississippi Unclassifiable/Attainment Area



5. Technical Analysis for All Remaining Areas in Mississippi

5.1. Introduction

The State of Mississippi has not timely installed and begun operation of a new, approved SO₂ monitoring network meeting EPA specifications referenced in EPA’s SO₂ DRR for any sources of SO₂ emissions in the counties identified in Table 9. Accordingly, the entirety of Mississippi must be designated by the Round 3 deadline of December 31, 2017. At this time, there are no air quality modeling results available to the EPA for these counties. In addition, there are no air quality monitoring data that indicate any violations of the 1-hour SO₂. Therefore, the EPA is designating the counties in Table 9 in the state as “unclassifiable/attainment” since these counties were not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.

Table 9. Counties that the EPA Intends to Designate Unclassifiable/Attainment¹²

County	Mississippi Recommended Area Definition	Mississippi’s Recommended Designation	The EPA’s Intended Area Definition	The EPA’s Intended Designation
Adams County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Alcom County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Amite County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Attala County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Benton County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Bolivar County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Calhoun County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Carroll County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Chickasaw County	Entire County	Unclassifiable/Attainment	Same as State	Same as State

¹² The EPA previously designated Lamar County unclassifiable/attainment in its entirety on June 30, 2016 based on a modeling analysis for the R.D. Morrow Senior Generating Plant submitted by the state of Mississippi. Therefore, this county is not considered in Table 9 as remaining counties the EPA intends to designate unclassifiable/attainment by December 31, 2017.

County	Mississippi Recommended Area Definition	Mississippi's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Claiborne County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Clarke County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Clay County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Coahoma County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Copiah County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Covington County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
DeSoto County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Forrest County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Franklin County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
George County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Greene County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Grenada County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Hancock County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Harrison County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Hinds County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Holmes County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Humphreys County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Issaquena County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Itawamba County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Jasper County	Entire County	Unclassifiable/Attainment	Same as State	Same as State

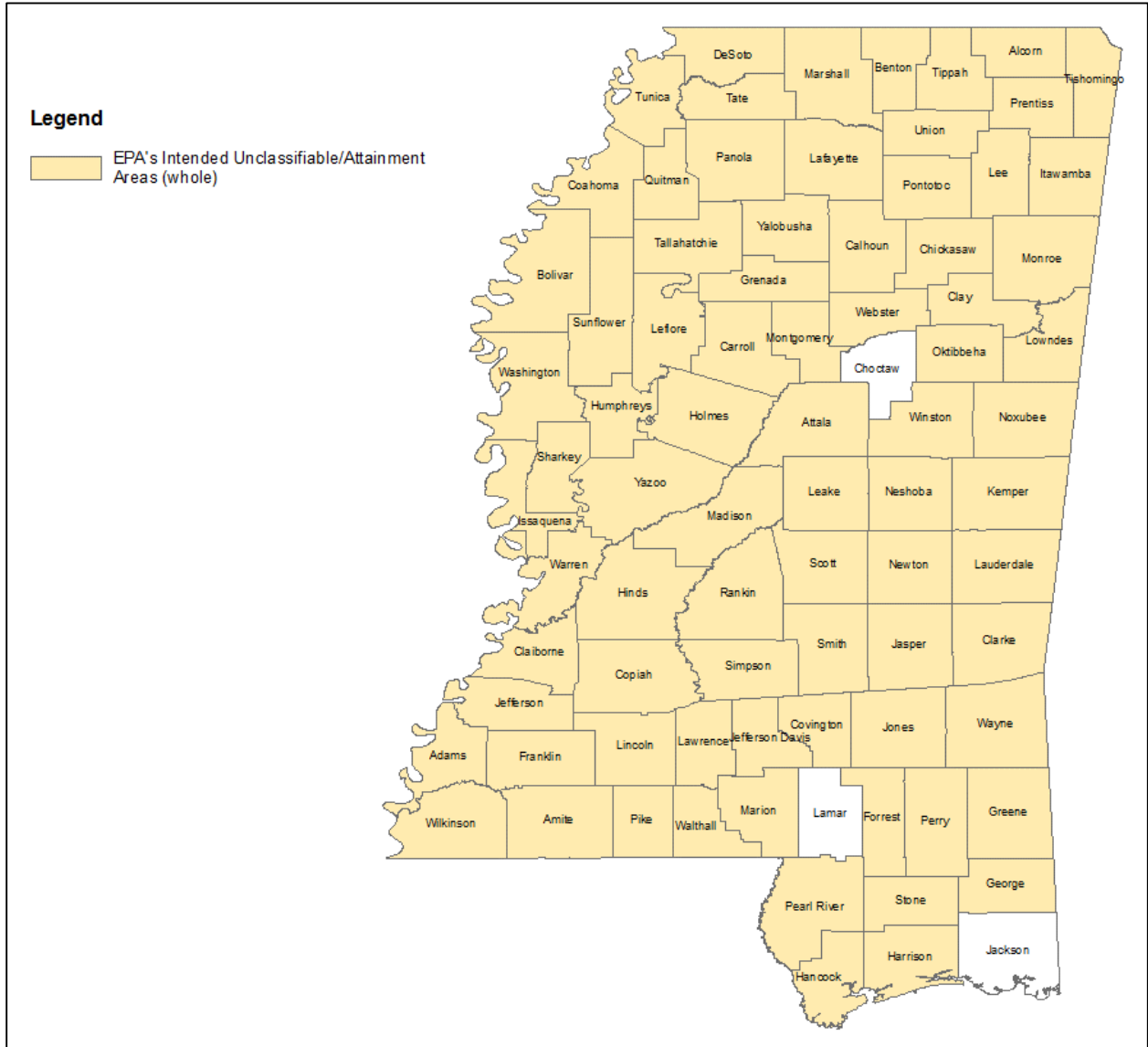
County	Mississippi Recommended Area Definition	Mississippi's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Jefferson County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Jefferson-Davis County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Jones County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Kemper County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lafayette County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lauderdale County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lawrence County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Leake County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lee County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Leflore County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lincoln County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Lowndes County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Madison County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Marion County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Marshall County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Monroe County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Montgomery County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Neshoba County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Newton County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Noxubee County	Entire County	Unclassifiable/Attainment	Same as State	Same as State

County	Mississippi Recommended Area Definition	Mississippi's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Oktibbeha County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Panola County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Pearl-River County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Perry County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Pike County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Pontotoc County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Prentiss County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Quitman County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Scott County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Sharkey County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Simpson County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Smith County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Stone County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Sunflower County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Tallahatchie County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Tate County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Tippah County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Tishomingo County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Tunica County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Union County	Entire County	Unclassifiable/Attainment	Same as State	Same as State

County	Mississippi Recommended Area Definition	Mississippi's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Walthall County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Warren County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Washington County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Wayne County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Webster County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Wilkinson County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Winston County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Yalobusha County	Entire County	Unclassifiable/Attainment	Same as State	Same as State
Yazoo County	Entire County	Unclassifiable/Attainment	Same as State	Same as State

Table 9 also summarizes Mississippi's recommendations for these areas. Specifically, the State recommended that every undesignated county be designated as unclassifiable/attainment based on the information mentioned above. After careful review of the State's assessment, supporting documentation, and all available data, the EPA agrees with the State's recommendation for these areas and intends to designate the areas as unclassifiable/attainment. Figure 17 shows the locations of these areas within Mississippi. Counties previously designated unclassifiable in Round 1 (*see 78 Federal Register 4719*) and Round 2 (*see 81 Federal Register 45039*) will remain unchanged unless otherwise noted.

Figure 17. The EPA's Intended Unclassifiable/Attainment Designation(s) for Counties in Mississippi



5.2. Air Quality Monitoring Data for the Remaining areas in Mississippi

AQS monitors identified in Table 10 below, located in two of the remaining undesignated counties have sufficient valid data for 2014–2016, and these data do not indicate that there were any violations of the 2010 SO₂ NAAQS at the monitoring sites in that period. Additionally, no DRR sources are located near these monitors, nor in these counties. Accordingly, the intended designation of unclassifiable/attainment is appropriate.¹³

Table 10. Monitoring Data for Counties that the EPA Intends to Designate Unclassifiable/Attainment

County	AQS ID	Latitude	Longitude	2014-2016 Design Value
Hinds	28-049-0020	32.32917	-90.18278	13
Jackson	28-059-0006	30.37806	-88.53389	21**

**This monitor is located in Pascagoula and is addressed in Section 3 and 4 of this document as a background monitor.

5.3. Jurisdictional Boundaries in the Remaining Areas in Mississippi

Existing jurisdictional boundaries are considered for the purpose of informing the EPA’s designation action for the remaining areas in the State. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable. In its January 10, 2017, submission, Mississippi recommended that the entire state be designated as unclassifiable/attainment.

¹³ The most recent SO₂ design values for all areas of the country are available at <https://www.epa.gov/air-trends/air-quality-design-values>.

5.4. The EPA's Assessment of the Available Information for the Remaining Areas in Mississippi.

These counties were not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. These counties therefore meet the definition of an "unclassifiable/attainment" area.

Our intended unclassifiable/attainment areas, generally bounded by county boundaries, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

Following the completion of these Round 3 designations, there will be no remaining undesignated areas in Mississippi that will be addressed in Round 4.

5.5. Summary of Our Intended Designation for the Remaining areas in Mississippi

After careful evaluation of the state's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate the remaining counties in Mississippi as unclassifiable/attainment for the 2010 SO₂ NAAQS. Specifically, the boundaries are comprised of clearly defined county boundaries in the state. Figure 17 above shows the location of these areas within Mississippi as well as the boundaries of these intended unclassifiable/attainment areas. For each of the counties listed in Table 9 the boundary of the unclassifiable/attainment area is the county boundary. At this time, our intended designations for the state only apply to this area and the other areas presented in this technical support document.