Technical Support Document:

Chapter 9
Intended Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for Florida

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 (SO_2) primary national ambient air quality standard (NAAQS) (2010 SO_2 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 SO_2 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 SO_2 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.[1] 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 SO_2 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.

[1] 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.

This technical support document (TSD) addresses designations for nearly all remaining undesignated areas in Florida for the 2010 SO_2 NAAQS. In previous final actions, the EPA has issued designations for the 2010 SO_2 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 SO_2 NAAQS. After the Round 3 designations are completed, the only remaining undesignated areas will be those where a state has installed and begun timely operating a new SO_2 monitoring network meeting the EPA specifications referenced in the EPA's SO_2 Data Requirements Rule (DRR) (80 FR 51052).

Florida, through the Florida Department of Environmental Protection (Florida) submitted its first recommendations regarding designations for the 2010 1-hour SO_2 NAAQS on June 13, 2011, and November 28, 2011. These submissions included recommended nonattainment boundaries for portions of Hillsborough and Nassau Counties, and "unclassifiable" or "unclassifiable/attainment" for the rest of the State. Florida submitted updated air quality analyses on January 13, 2017, recommending that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties. 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 Florida 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 Florida'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 the EPA's assessment and characterization of air quality.

Table 1. Summary of the EPA's Intended Designations and the Designation Recommendations by Florida

Area/County	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Citrus County, Florida	None	Attainment or Unclassifiable	Citrus County, Florida (p)	Nonattainment

[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	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Duval County, Florida	None	Attainment or Unclassifiable	Duval County, Florida	Unclassifiable/ Attainment
Escambia County, Florida	None	Attainment or Unclassifiable	Escambia County, Florida	Unclassifiable/ Attainment
Hamilton County, Florida	None	Attainment or Unclassifiable	Hamilton County, Florida	Unclassifiable/ Attainment
Hillsborough-Polk County, Florida	None	Attainment or Unclassifiable	Hillsborough County, Florida (p); Polk County, Florida (p)	Nonattainment
			Polk County, Florida (p)	Unclassifiable
Nassau County, Florida	None	Attainment or Unclassifiable	Nassau County, Florida (p)	Unclassifiable/ Attainment
Orange County, Florida	None	Attainment or Unclassifiable	Orange County, Florida	Unclassifiable/ Attainment
Putnam County, Florida	None	Attainment or Unclassifiable	Putnam County, Florida	Unclassifiable/ Attainment
Remaining Undesignated Areas to Be Designated in this Action*	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment

* Except for areas that are associated with sources for which Florida elected to install and began timely operation of a new SO_2 monitoring network meeting the EPA specifications referenced in the EPA's SO_2 DRR (*see* Table 2), the EPA intends to designate the remaining undesignated counties (or portions of counties) in Florida 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 sections 3 through 12 of this chapter.

There are no areas for which Florida elected to install and begin timely operation of a new, approved SO_2 monitoring network.

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. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. These memoranda supersede earlier designation guidance for the 2010 SO_2 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 SO_2 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 SO_2, the EPA released its most recent version of a draft document titled, "SO_2 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 SO_2 Primary National Ambient Air Quality Standard) and Chapter 2 (Intended Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for States with Sources Not Required to be Characterized). 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 SO_2 monitoring network meeting the EPA specifications referenced in the EPA's" SO_2 DRR. 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 monitoring networks. The areas to be designated by December 31, 2017, include the areas associated with 11 sources in Florida meeting DRR emissions criteria that states have chosen to be characterized using air dispersion modeling, the areas associated with one source in Florida for which air agencies imposed emissions limitations on sources to restrict their SO_2 emissions to less than 2,000 tons per year (tpy), 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 TSD is structured based on the availability of such modeling information. There is a section

[4] 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 SO_2 monitoring network design, to advise states that have elected to install and begin operation of a new SO_2 monitoring network. See Draft SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, February 2016, https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf.

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 SO_2 air quality monitoring data in the Air Quality System (AQS) database for all areas for which modeling analyses are available. For 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. The remaining to-be-designated counties are then addressed together in Section 13.

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 SO_2 NAAQS – The primary NAAQS for SO_2 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 SO_2 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 SO_2 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 SO_2 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.

[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.

6) Modeled violation – a violation of the SO_2 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.

3. Technical Analysis for the Polk County Area

3.1. Introduction

The EPA must designate the Polk County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Polk County.

There are multiple modeling areas of analysis in Polk County. Florida has grouped and/or separated sources as appropriate for this purpose. The available modeling analysis for each area of analysis will be presented, and then the discussion in this TSD will consider the aggregation of these results and explain how they relate to the intended designation for each county.

3.2. Air Quality Monitoring Data for the Polk County Area

This factor considers the SO_2 air quality monitoring data in the area of Polk County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as "attainment" or "unclassifiable" for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

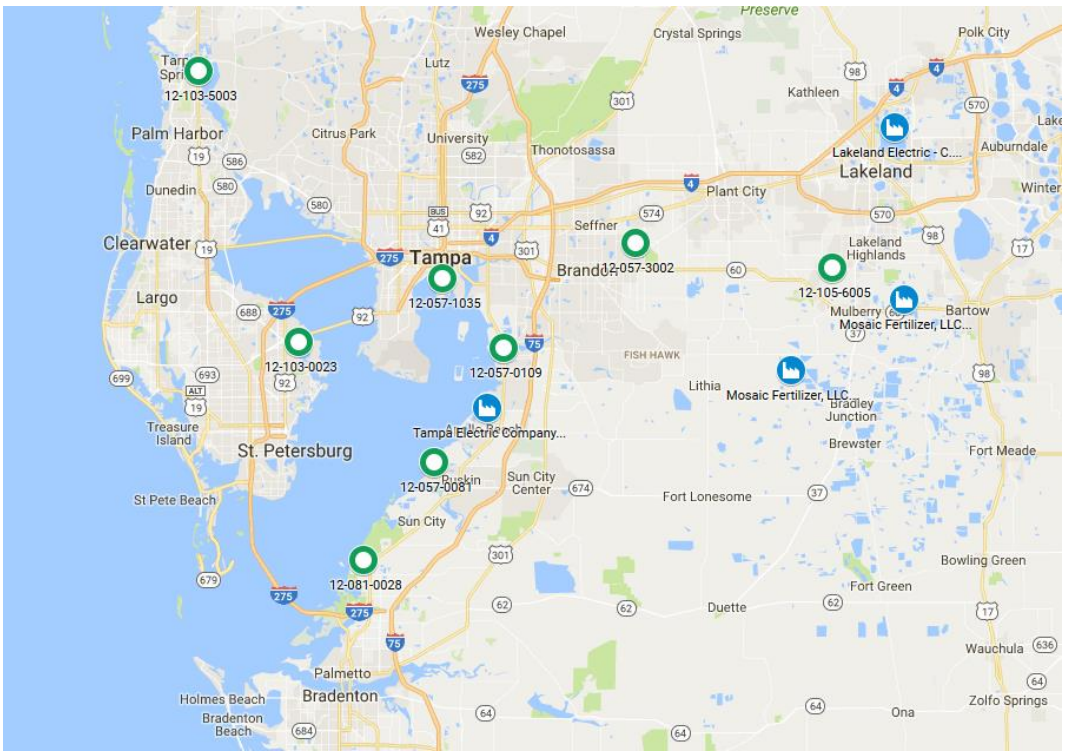
The EPA reviewed the available air quality monitoring data in the AQS database and found the following nearby data summarized in the table below:

Table 3. SO_2 Monitoring Data in or Near Polk County

County	AQS Monitor ID	Monitor Location	2014-2016 SO_2 Design Value (ppb)
Polk	12-105-6005	27.93975, -82.00008	23
Hillsborough	12-057-0081	27.74003, -82.46515	16
Hillsborough	12-057-0109	27.85669, -82.38348	66
Hillsborough	12-057-1035	27.92836, -82.45454	19
Hillsborough	12-057-3002	27.96565, -82.23040	13
Pinellas	12-103-0023	27.86363, -82.62315	7
Pinellas	12-103-5003	28.14167, -82.73972	4

The locations of the monitoring sites, relative to the SO_2 sources in the area subject to characterization under the DRR, are shown in the map below:

Figure 1. Map of nearby SO_2 Monitors to Polk County Area



The Sikes Elementary School SO_2 monitor (AQS ID: 12-057-0081) is the closest monitor to the three DRR sources in Polk County. The monitor is located 10.8 miles southwest of Lakeland Electric - C.D. McIntosh, Jr. Power Plant, 5.6 miles west of Mosaic Fertilizer – Bartow Facility, and 7.9 miles northeast of Mosaic Fertilizer – New Wales Facility. Data collected by all monitors in the table above are comparable to the NAAQS, and all indicate that the most recent monitored SO_2 levels are below the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data from these monitors (2014-2016) indicate a 1-hr SO_2 design value of 23 ppb at the Sikes Elementary School monitor in Polk County. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations for the area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Polk County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

3.3. Air Quality Modeling Analysis for the Polk County Area Addressing Mosaic Fertilizer, LLC., (New Wales) Mulberry Facility

3.3.1. Introduction

This section 3.3 presents all the available air quality modeling information for a portion of Polk County that includes Mosaic Fertilizer Mulberry (New Wales) Facility. (This portion of Polk County will often be referred to as "the Polk County area" within this section 3.3). This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 (tpy):

- The Mosaic New Wales and Mosaic Fertilizer – Bartow facilities emitted 2,000 tons or more annually. Specifically, Mosaic New Wales emitted 7,126.50 tons of SO_2 in 2014, and Mosaic Bartow emitted 4,045.72 tons of SO_2 in 2014. These sources meet the DRR criteria and thus are on the SO_2 DRR Source list. Florida has chosen to characterize them via modeling.

- The Mosaic Fertilizer South Pierce and TECO Polk Power Station facilities do not emit 2,000 tons or more annually, but were included in the modeling assessment.

Because we have available results of air quality modeling in which these sources are modeled together, the area around this group of sources is being addressed in this section with consideration given to the impacts of all these sources.

In its submission, Florida recommended that an area that includes the area surrounding the facility, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. 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 is modifying the State's recommendation for the area and intends to designate a portion of the area as nonattainment. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented.

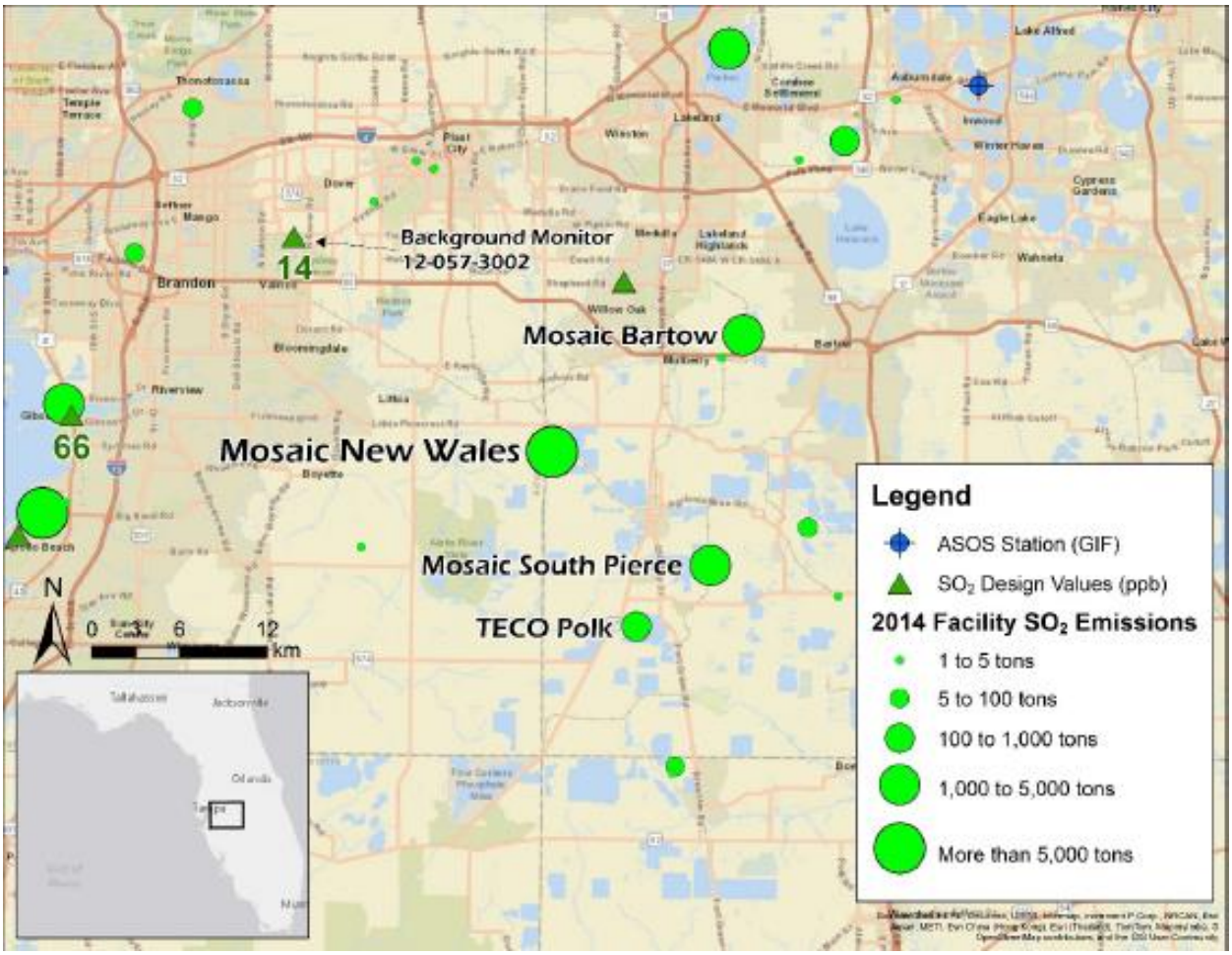
The area that the State has assessed via air quality modeling is located in the western part of the State of Florida.

As seen in Figure 2 below, the New Wales facility is located in Polk County within the city of Mulberry. The New Wales facility is near Mizelle Creek adjacent to Alafia River State Park.

Also included in the figure are other nearby emitters of SO_2.[6] The nearby emitters labeled in Figure 2 are Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow. Additional sources in Figure 2 which are not labeled include Duke Hines Energy Complex, Seminole Electric Midulla Station, Wheelabrator Ridge Energy, Lakeland Electric McIntosh, Hillsborough Resource Recovery, Mosaic Fertilizer Riverview, and TECO Big Bend Station. These facilities are 35 kilometers (km) or less from the New Wales site and are all located in the western part of the State.

The State did not recommend a specific boundary for the "attainment" or "unclassifiable" designation. The EPA's intended nonattainment designation boundary for the Polk County area is not shown in this figure, but is shown in a figure in the section below that summarizes our intended designation.

Figure 2. Map of the Polk County Area Addressing Mosaic - New Wales. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[6] All other SO_2 emitters of 1 tpy or more based on information provided by the State of Florida are shown in Figure 2. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

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 three modeling assessments, including three assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 4. Modeling Assessments for the Polk County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida DEP	6/23/2017	Supplemental New Wales Modeling	Modeling using future allowable emissions not currently in effect
Florida DEP	01/13/2017	Polk County (New Wales) Modeling Report	Report
Florida DEP	06/30/2016	Florida Modeling Protocol	Protocol

On June 23, 2017, Florida submitted a Supplemental Air Modeling Demonstration for the Mosaic New Wales DDR facility. This supplemental modeling is extensive and includes over 300 AERMOD modeling runs. Due to the timing of the submittal, the EPA is still reviewing the supplemental modeling demonstration to evaluate whether it is appropriate to inform the designation recommendation for the area. Therefore, during the interim, the January 13, 2017, modeling report is being used as the basis for the EPA's designation recommendation. The following sections summarize the information from the January 13, 2017, Modeling Report that was utilized.

3.3.2. Modeling Analysis Provided by the State

The State submitted the modeling protocol to the EPA on June 30, 2016, for review. No issues were found with the modeling protocol of the New Wales facility. The final modeling report was submitted January 13, 2017. The report indicated the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain was 419.24 micrograms per cubic meter ($\mu g/m^3$), equivalent to 160.08 ppb.

The modeling report does not significantly change any inputs, model versions, or components from the protocol. The final report from the State is primarily used in this chapter, but details from the protocol may be relevant.

3.3.2.1.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. 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

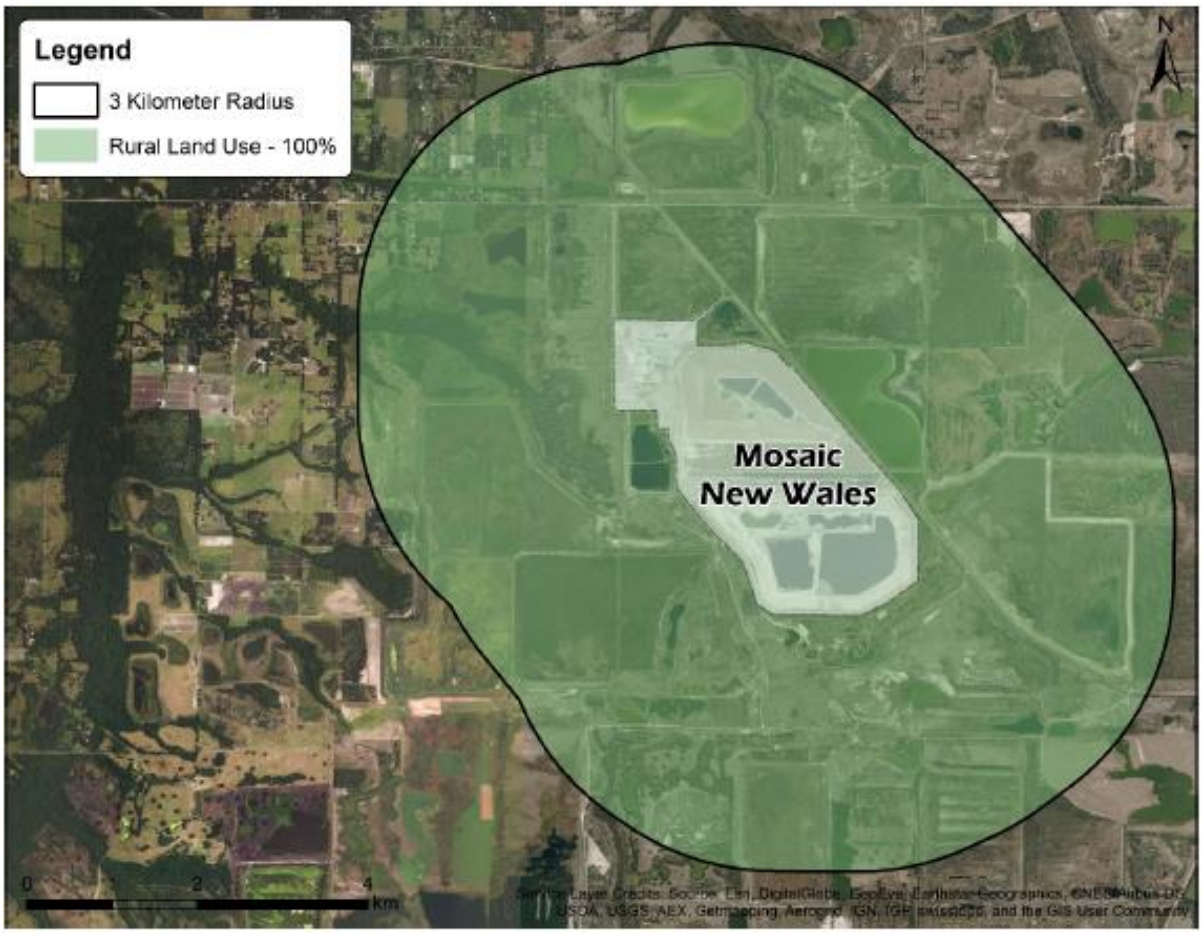
For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The State used the Auer method to determine the majority of the land use. The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. Through this method, the State found that rural land use constitutes essentially all of the 3-km radius around Mosaic New Wales as depicted in Figure 3.

The EPA agrees with the State's assessment and conclusion of the land use and find it appropriate to use the rural mode within the AERMOD tool for this area.

Figure 3. Land Use Around New Wales Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The sources of SO_2 emissions subject to the DRR in this area are described in the introduction to this section. For the Polk County area, the State has included three other emitters of SO_2 that are located within 35 km of New Wales in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to New Wales, the other

emitters of SO_2 included in the area of analysis are: Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow. Florida also assessed other SO_2 emissions sources in the Polk County area. Table 5 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 5. SO_2 Emissions Sources within 35 km of the Mosaic New Wales Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from Mosaic New Wales (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
105-0059	Mosaic Fertilizer New Wales [a,b]	0	0	7,126.50	Yes
105-0055	Mosaic Fertilizer South Pierce [a]	13	260	1,731.77	Yes
105-0233	TECO Polk Power Station [a]	13	260	1,245.17	Yes
105-0046	Mosaic Fertilizer Bartow [a,b]	16	320	4,045.72	Yes
105-0234	Duke Hines Energy Complex	18	360	23.72	No
049-0340	Seminole Electric Midulla Station	23	460	5.84	No
105-0216	Wheelabrator Ridge Energy	30	600	213.77	No
105-0004	Lakeland Electric McIntosh [b]	30	600	2,156.63	Yes
057-0261	Hillsborough Resource Recovery	32	640	13.89	No
057-0008	Mosaic Fertilizer Riverview	34	680	2,209.13	Yes
057-0039	TECO Big Bend Station [b]	35	700	11,156.71	Yes

a. Explicitly modeled facility.
b. DRR-applicable facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and/or are located large distances from the Mosaic New Wales facility. The EPA also agrees with Florida that the additional sources would not be expected to cause a significant concentration gradient near the Mosaic New Wales facility. Any potential impacts from these sources are accounted for in the analysis using representative background monitoring data from the Sydney monitor located approximately 23 km northwest of the Mosaic New Wales facility.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The grid receptor spacing for the area of analysis chosen by the State is as follows:
The State developed a uniform method for dense receptor grid placement for all DRR sources in Florida. A dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals out to 7,500 m. The dense receptor grid is evident in Table 6.

Table 6. Dense Receptor Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	SAP 2
Unit UTM Zone	17N
Unit UTM Easting (m)	396,550.77
Unit UTM Northing (m)	3,078,958.33
Actual Stack Height (m)	60.96
Expected Distance to Max Concentration (m)	610
20 Times Stack Height (m)	1,219
100 m Receptor Spacing - Extent from the Origin (m)	2,500
250 m Receptor Spacing - Extent from the Origin (m)	5,000
500 m Receptor Spacing - Extent from the Origin (m)	7,500
Plant Boundary Receptor Spacing (m)	50
Total Receptors	3,986

The receptor network contained 3,986 receptors, and the dense network covers the northeastern area of the New Wales facility in the State of Florida.

Figures 4 and 5, included in the State's recommendation, show the State's chosen area of analysis surrounding the New Wales facility, as well as the receptor grid for the area of analysis.

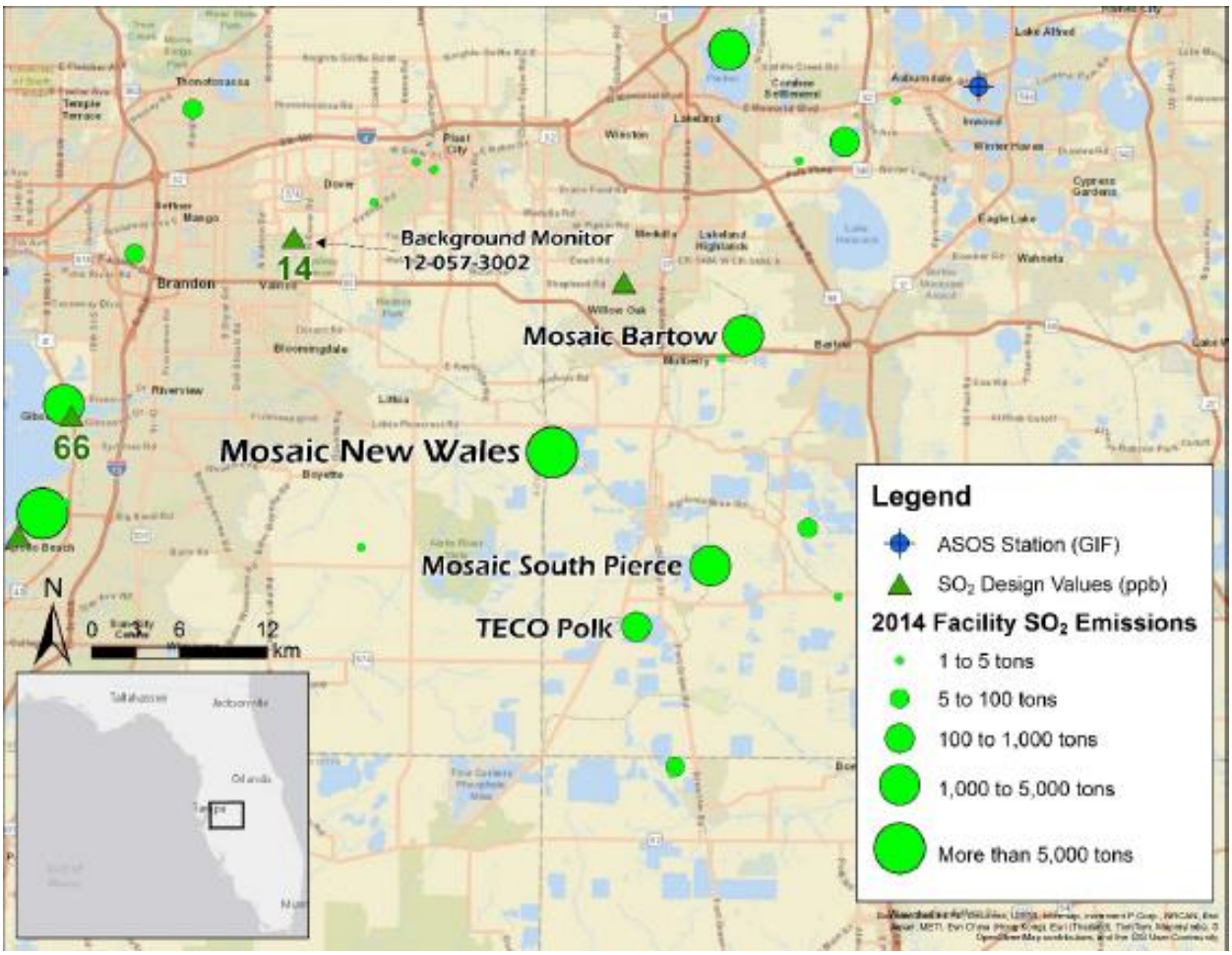
Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

Receptors located within Mosaic New Wales's fenceline were removed and receptors were placed with 50 m spacing along the fenceline. Section 4.2 of the Modeling TAD describes a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The State chose not to employ this process and instead included receptors in all areas the State considered to be ambient air within 7.5 km of Mosaic New Wales. Figure 5 from the Florida Modeling Report shows the Mosaic New Wales fence line boundary. However, no information was provided in Florida's Modeling Report for the Polk County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[7] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

[7] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 4. Area of Analysis for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



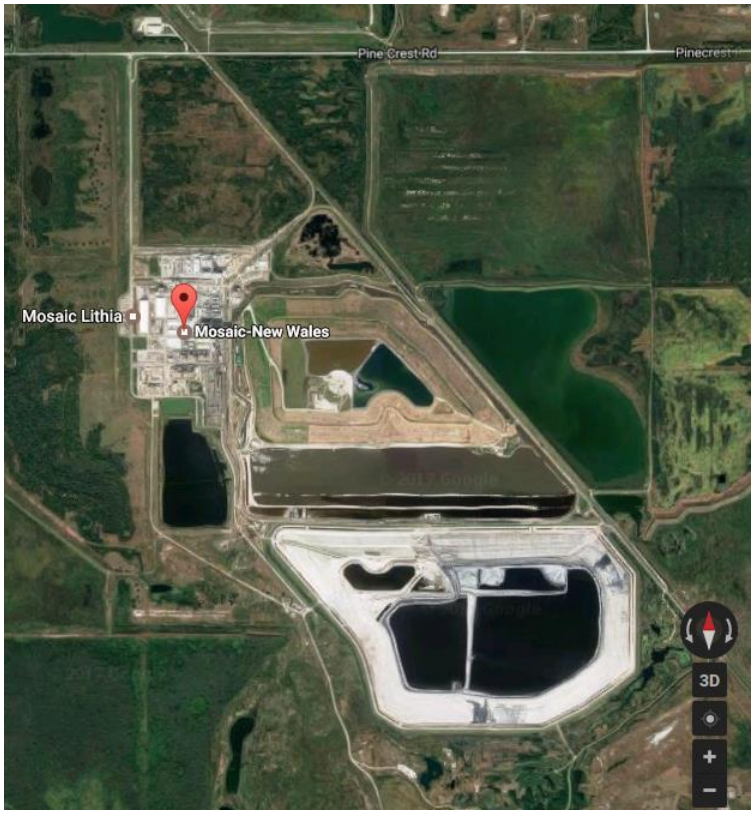
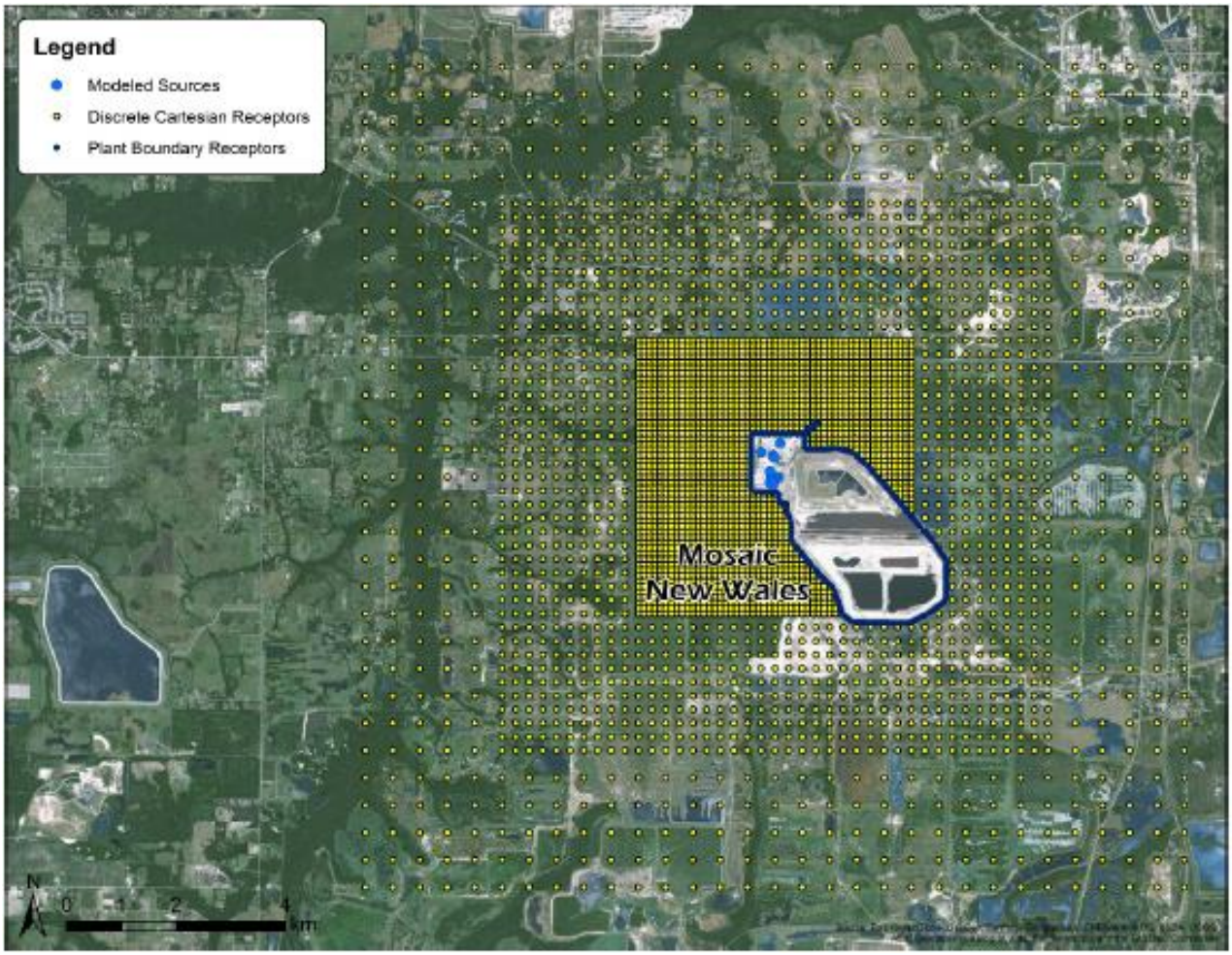

Pine Crest Rd
Pinecrest
Mosaic Lithia
Mosaic-New Wales
3D

Figure 5. Receptor Grid for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 practices (GEP) policy with allowable emissions.

The State chose to include four sources in the modeling near the New Wales facility that had the potential to cause a significant concentration gradient in the area near Mosaic New Wales. These facilities include: Mosaic Fertilizer New Wales, Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow. The state chose these facilities based on them being within 35 km of New Wales as discussed in Section 3.3.2.3 above. The Mosaic Bartow facility is also on the DRR source list because it emitted over 2,000 tpy of SO_2 in 2014. While the Mosaic Bartow facility was included in the Mosaic New Wales modeling analysis, Florida also performed a separate modeling analysis to evaluate the area of Polk County near the Mosaic

Bartow facility. This analysis, which included emissions from the Mosaic New Wales facility, shows no modeled violations in the area surrounding the Mosaic Bartow facility (see Section 3.4 of this TSD). Due to the large amount of emissions from the Mosaic Bartow facility (4,046 tpy in 2014) and its relatively close proximity to the Mosaic New Wales facilitythere is a possibility that the Mosaic Bartow facility could potentially be contributing to the modeled violations in the area near Mosaic New Wales.

Any potential impacts from the sources not explicitly modeled are accounted for in the analysis using representative background monitoring data from the Sydney monitor located approximately 23 km northwest of the Mosaic New Wales facility.

The State characterized these 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 along with the EPA's GEP policy. 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 BPIPPRM was used to assist in addressing building downwash.

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 enforceable and effective.

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 SO_2 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 SO_2 emissions inventories used for permitting or state implementation plan (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 Mosaic New Wales and three other emitters of SO_2 within 35 km in the area of analysis. The State has chosen to model these facilities using a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The facilities in the State's modeling analysis and their associated annual actual SO_2 emissions between 2012 and 2014 or PTE rates are summarized below.

For Mosaic Fertilizer New Wales, Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow, the State provided annual actual SO_2 emissions between 2012 and 2014. This information is summarized in Table 7. A description of how the State obtained hourly emission rates is given below this table.

Table 7. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Polk County Area

	SO_2 Emissions (tpy)		
Facility Name	**2012**	**2013**	**2014**
Mosaic Fertilizer New Wales	7,104.39	7,194.14	7,126.50
Mosaic Fertilizer South Pierce	1,210.11	1,453.97	1,731.77
Mosaic Fertilizer Bartow	3,931.25	4,173.72	4,045.72
TECO Polk Power Station	884.41	974.29	1,079.13
Total Emissions from Facilities in the Area of Analysis	13,130.16	13,796.12	13,983.13

For Mosaic Fertilizer New Wales, Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow, the actual hourly emissions data were obtained from CEMS.

Florida developed actual emission using the EPA modeling TAD and used 2012-2014 CEMS data. The EPA agrees with Florida approach.

For Mosaic Fertilizer New Wales and TECO Polk Power Stations, the State also provided PTE values for their sources that did not have CEMS. This information is summarized in Table 8. A description of how the State obtained hourly emission rates is given below this table.

Table 8. SO_2 Emissions based on PTE from Facilities in the Area of Analysis for the Polk County Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
Mosaic Fertilizer New Wales	12.94
TECO Polk Power Station	10,471
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	10,483.94

Mosaic Fertilizer New Wales included three ammonium phosphate fertilizers plants, an animal feed ingredient plant and a sulfur handling system on-site that contribute a small amount of additional SO_2 emissions. TECO Polk included a SAP and an emergency flare. The emissions values shown in the table above are based on the assumption that the sources would emit at their maximum permitted short-term emission rates for all hours of the three years modeled. The TECO Polk emergency flare typically operates less than 150 hours per year; but, is also the second largest source of SO_2 emissions at this facility. The flare was modeled according to the EPA guidance and using its maximum annual emission rate from the period 2012-2014. This is a conservative approach for approximating impacts from this intermittently operated emergency source.

For the permitted allowable emissions limits that have averaging times greater than a 1-hour average (e.g., 30-day average limits), Florida appropriately converted the limits to 1-hour average limits using the procedures contained in the EPA's April 23, 2014, "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions." The PTE in tons per year for each of these facilities provided in the table above was determined by the EPA by multiplying the maximum allowable hourly permitted emission rates (PTE) in pounds per hour for each unit by 8,760 hours in a year and dividing by 2000 pounds per ton. The facilities were modeled using maximum allowable emissions and corresponding stack parameters consistent with the GEP Policy. Emissions were assumed to be the same in each modeled year.

The EPA agrees with Florida's use of actual emissions for most of the emissions units at the Mosaic New Wales, Mosaic Bartow, Mosaic South Pierce and the TECO Polk Power Station. We also agree with the use of permit allowable (PTE) emissions for remaining units at the Mosaic New Wales and TECO Polk Power Station. We believe that Florida has provided adequate documentation to show that these emissions for these sources were applied appropriately in the modeling.

3.3.2.6.Modeling Parameter: Meteorology and Surface Characteristics

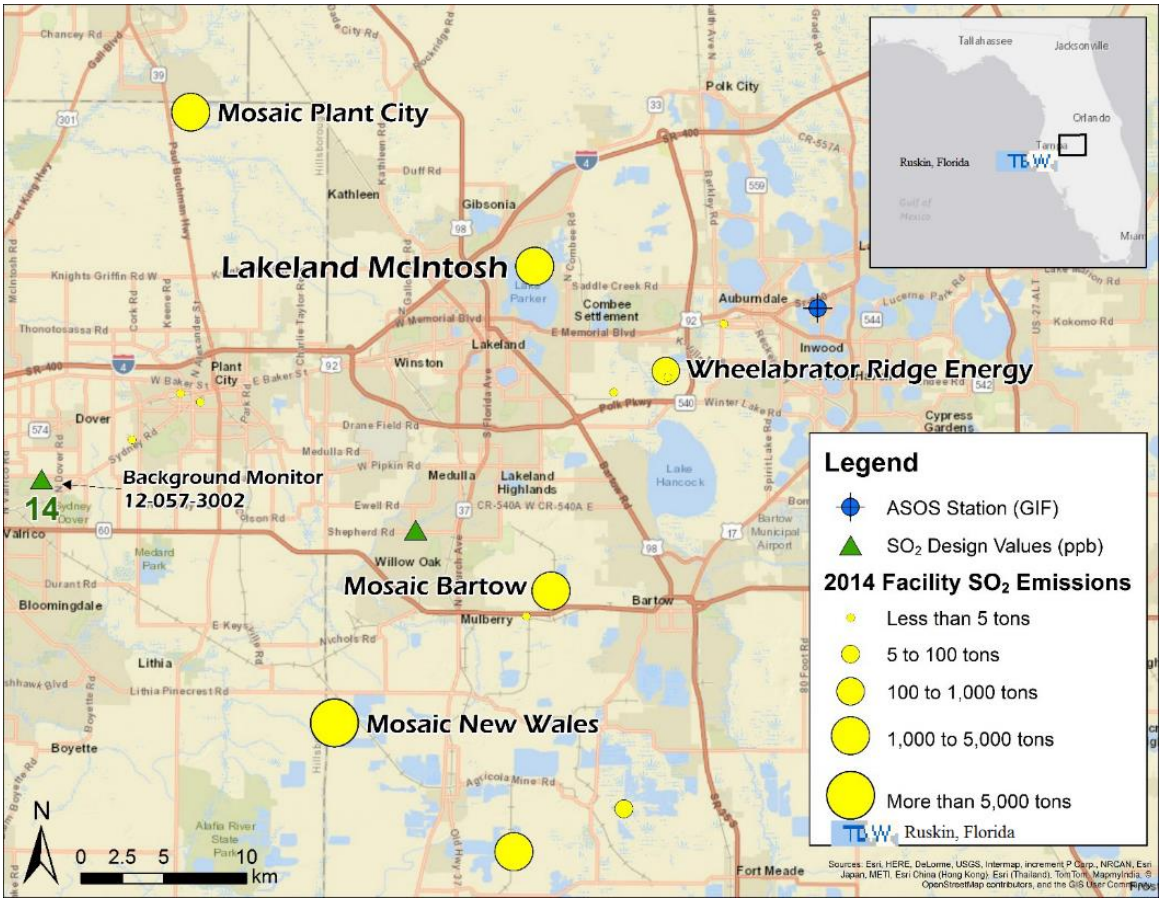
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Polk County, Florida, area, the State selected the surface meteorology from Winter Haven Municipal Airport, located approximately 38 km northwest of the Mosaic New Wales facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis.

The State used AERSURFACE version 13016 using data from Winter Haven Municipal 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

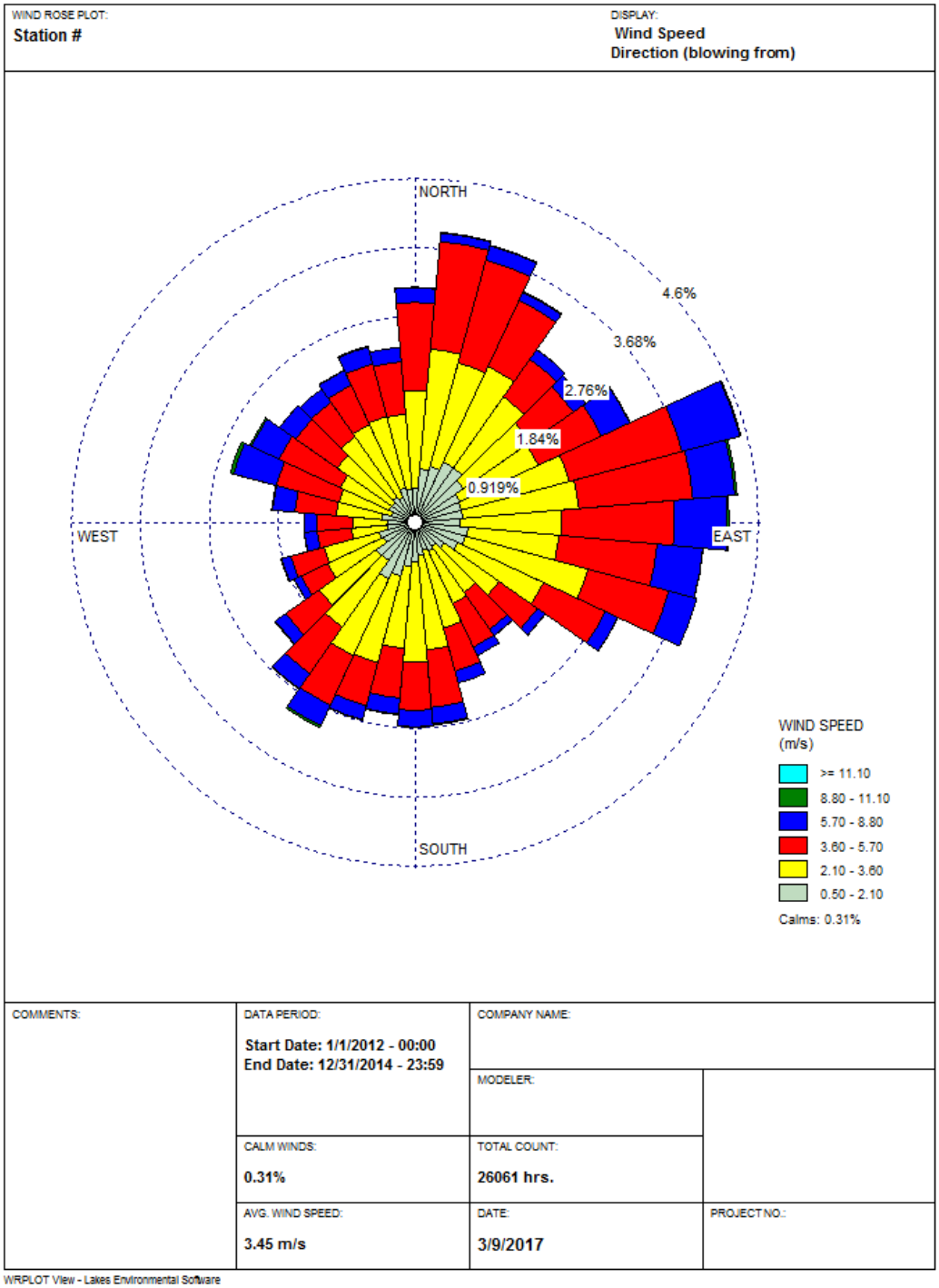
In the figure below, generated by the State, the location of this NWS stations is shown relative to the area of analysis.

Figure 6. Area of Analysis and the NWS station in the Polk County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Winter Haven Municipal Airport for the 2012-14 period. In Figure 7, 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 predominately blow from the north and east directions.

Figure 7. Winter Haven Municipal Airport 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 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 Winter Haven Municipal Airport, 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 (m/s) 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Winter Haven Municipal Airport, located approximately 38 km northwest of the Mosaic New Wales facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Mosaic New Wales can be expected to the southwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Winter Haven Municipal Airport location. Florida followed with the EPA guidance in developing this aspect of its modeling parameters.

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. To account for any terrain changes, the State used 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 1992 National Land Cover Dataset.

While Polk County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

3.3.2.8.Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002), approximately 23 km northwest of the Mosaic New Wales facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from the sources explicitly included in the modeling. In this case, any measurement recorded when the wind direction was from 23° to 174° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. Table 9 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 9. Tier 2 Temporally Varying Background Concentrations from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.33	1.33	1.00	2.33	12:00	3.67	2.67	3.33	3.67
1:00	1.33	1.00	0.67	1.33	13:00	4.33	3.00	3.67	3.33
2:00	1.00	0.67	1.00	1.67	14:00	2.67	2.00	2.67	3.00
3:00	2.33	0.67	1.00	1.00	15:00	2.00	1.33	1.67	2.33
4:00	1.00	0.33	1.00	1.33	16:00	2.67	1.33	1.67	2.33
5:00	1.00	0.33	1.00	1.33	17:00	2.00	1.33	1.33	1.67
6:00	1.33	0.67	2.00	1.67	18:00	2.00	1.00	1.00	1.67
7:00	1.33	1.67	2.00	2.00	19:00	2.00	1.00	0.67	1.33
8:00	2.00	2.67	2.00	4.33	20:00	3.00	1.00	1.33	2.33
9:00	4.33	1.33	2.67	4.00	21:00	2.00	1.67	1.33	2.00
10:00	4.00	1.33	2.00	3.67	22:00	2.00	6.67	7.00	2.00
11:00	2.67	2.00	1.33	3.67	23:00	1.67	2.00	1.33	2.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

3.3.2.9.Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Polk County area of analysis is summarized below in Table 10.

Table 10. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Polk County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	25
Modeled Stacks	25
Modeled Structures	28
Modeled Fencelines	1
Total receptors	3986
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Winter Haven Municipal Airport
NWS Station Upper Air Meteorology	Ruskin, Florida
NWS Station for Calculating Surface Characteristics	Winter Haven Municipal Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site # 12-057-3002, Tier 2 based on temporally varying approach.
Calculated Background SO_2 Concentration	Temporally varying

The results presented below in Table 11 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

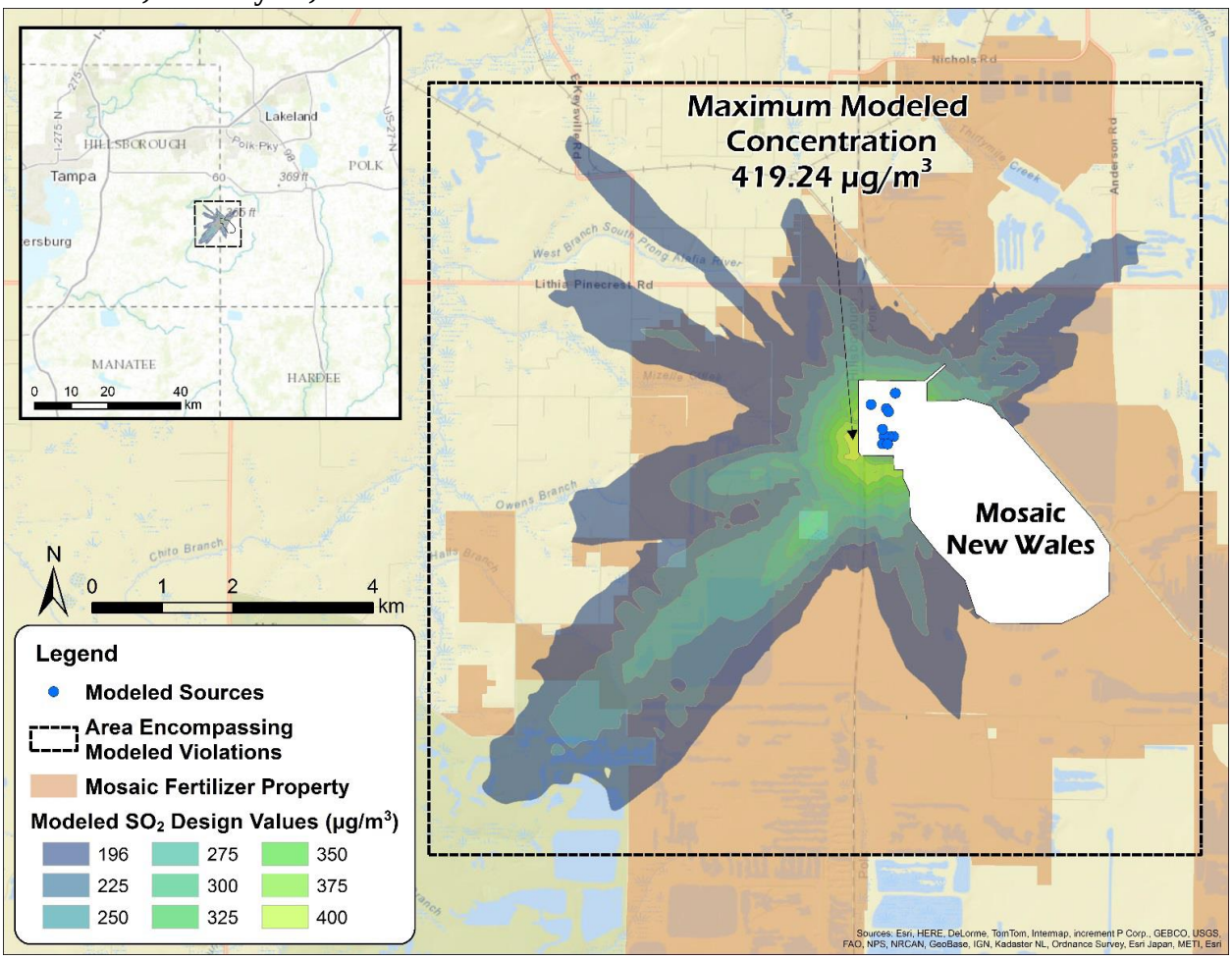
Table 11. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	396050.78	3078958.25	419.24	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 419.24 μg/m^3, equivalent to 160.08 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual emissions from the facilities. Figure 8 below was included as part of the State's recommendation, and indicates that the predicted value occurred west of the Mosaic-New Wales facility. The State's receptor grid is also shown in the figure.

Figure 8. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State indicates that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. The modeling results also include the area in which a NAAQS violation was modeled, information that is relevant to the selection of the boundaries of the area that will be designated.

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

The EPA agrees that Florida has appropriately characterized the area surrounding the Mosaic New Wales facility. Given the criteria for selecting nearby sources, we believe that the decision to include three additional sources, Mosaic Fertilizer South Pierce, TECO Polk Power Station, and Mosaic Fertilizer Bartow, and excluding all other sources from the modeling analysis was correct. Actual emissions from the 2012-14 period were used in the analysis which provides for an appropriate assessment of SO_2 concentrations in the area. Due to the large amount of emissions from the Mosaic Bartow facility (4,046 tpy in 2014) and its relatively close proximity to the Mosaic New Wales facility, there is a possibility that the Mosaic Bartow facility could potentially be contributing to the modeled violations in the area near Mosaic New Wales. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State indicates that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the Mosaic New Wales facility.

3.4. Air Quality Modeling Analysis for the Polk County Area Addressing Mosaic Fertilizer, LLC Bartow Facility

3.4.1. Introduction

This section 3.4 presents all the available air quality modeling information for a portion of Polk County that includes Mosaic Fertilizer - Bartow. (This portion of Polk County will often be referred to as "the Polk County area" within this section 3.4). This area contains the following SO_2 sources, principally the sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tpy:

- The Mosaic Fertilizer – Bartow, Mosaic New Wales, and Lakeland Electric McIntosh facilities emitted 2,000 tons or more annually. Specifically, Mosaic Bartow emitted 4,045.72 tons of SO_2 in 2014, Mosaic New Wales emitted 7,126.50 tons of SO_2 in 2014, and Lakeland Electric McIntosh emitted 2,156.53 tons of SO_2 in 2014. These sources meet the DRR criteria and thus are on the SO_2 DRR Source list, and Florida has chosen to characterize them via modeling.

- The Mosaic Fertilizer South Pierce, Wheelabrator Ridge Energy, and TECO Polk Power Station facilities do not emit 2,000 tons or more annually, but were included in the modeling assessment.

Because we have available results of air quality modeling in which these sources are modeled together, the area around this group of sources is being addressed in this section with consideration given to the impacts of all these sources.

In its submission, Florida recommended that an area that includes the area surrounding the facility, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from this facility and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. 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 intends to designate the area as unclassifiable/attainment. Our reasoning for this conclusion is explained in a later section, after all the available information is presented.

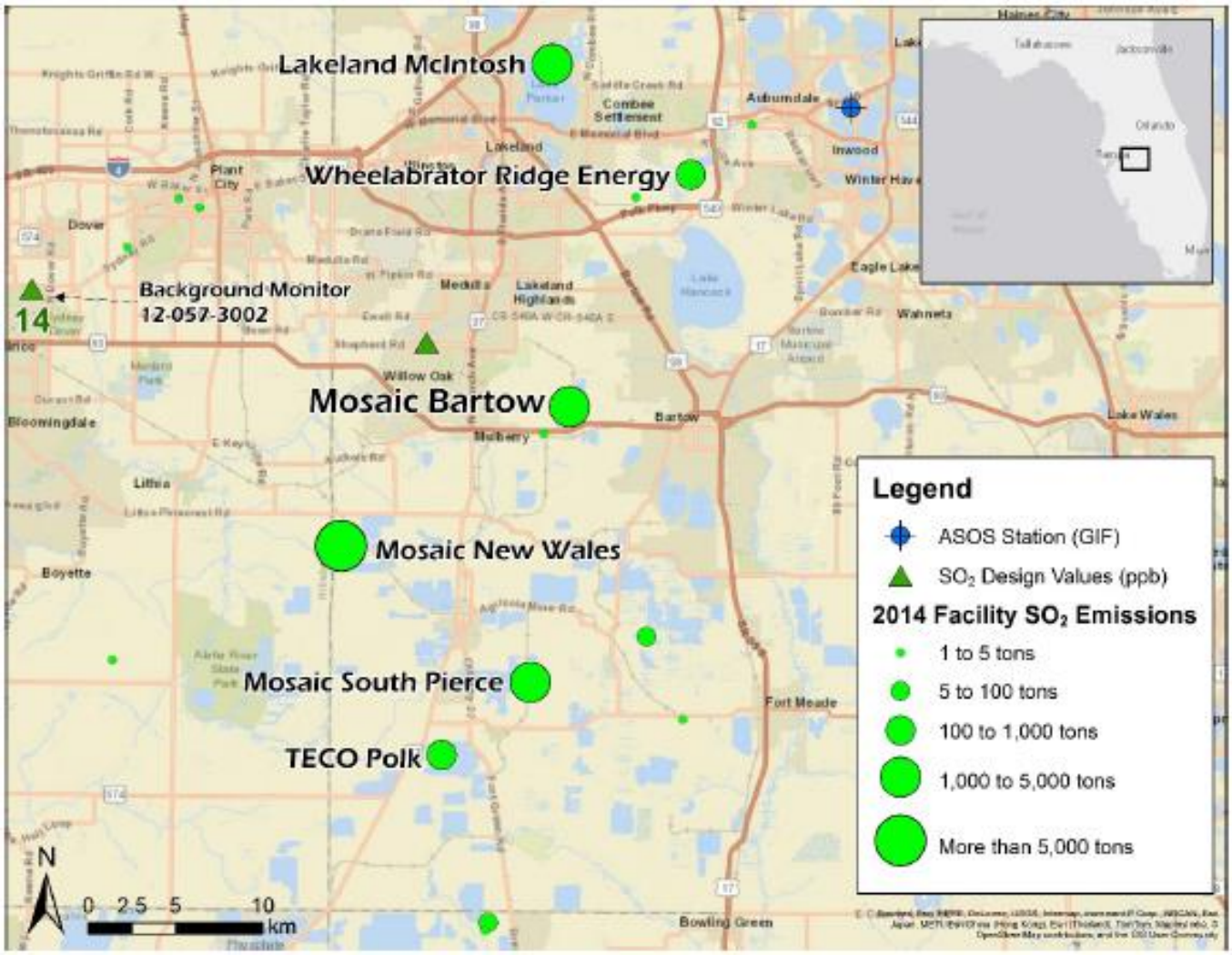
The area that the State has assessed via air quality modeling is located in central Florida in the city of Bartow area.

As seen in Figure 9 below, the Mosaic Bartow facility is located in central Florida near Bonny Lake in the City of Bartow.

Also included in the figure are other nearby emitters of SO_2.[8] The nearby emitters labeled in Figure 9 are Mosaic New Wales, Lakeland Electric McIntosh, Mosaic Fertilizer South Pierce, Wheelabrator Ridge Energy, and TECO Polk Power Station in the same vicinity in the City of Bartow.

[8] All other SO_2 emitters of 1 tpy or more based on information provided by the State of Florida are shown in Figure 9. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source.

Figure 9. Map of the Polk County Area Addressing Mosaic – Bartow. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two modeling assessments from the State and no assessments from other parties.

Table 12. Modeling Assessments for the Polk County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	01/13/2017	Mosaic Bartow Modeling Report	Modeling Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

3.4.2. Modeling Analysis Provided by the State

The State submitted the DRR modeling protocol to the EPA staff in June 2016. After the review was conducted, the EPA staff identified no issues with the modeling protocol that was provided. The Polk County Modeling Report does not show any significant changes from the inputs, model versions, or assessments of the protocol. The conclusions provided in the protocol are similar to the modeling assessment in the report. The Polk County Modeling Report from the State is primarily used in this TSD, but other details from the protocol may be relevant.

3.4.2.1.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

3.4.2.2.Modeling Parameter: Rural or Urban Dispersion

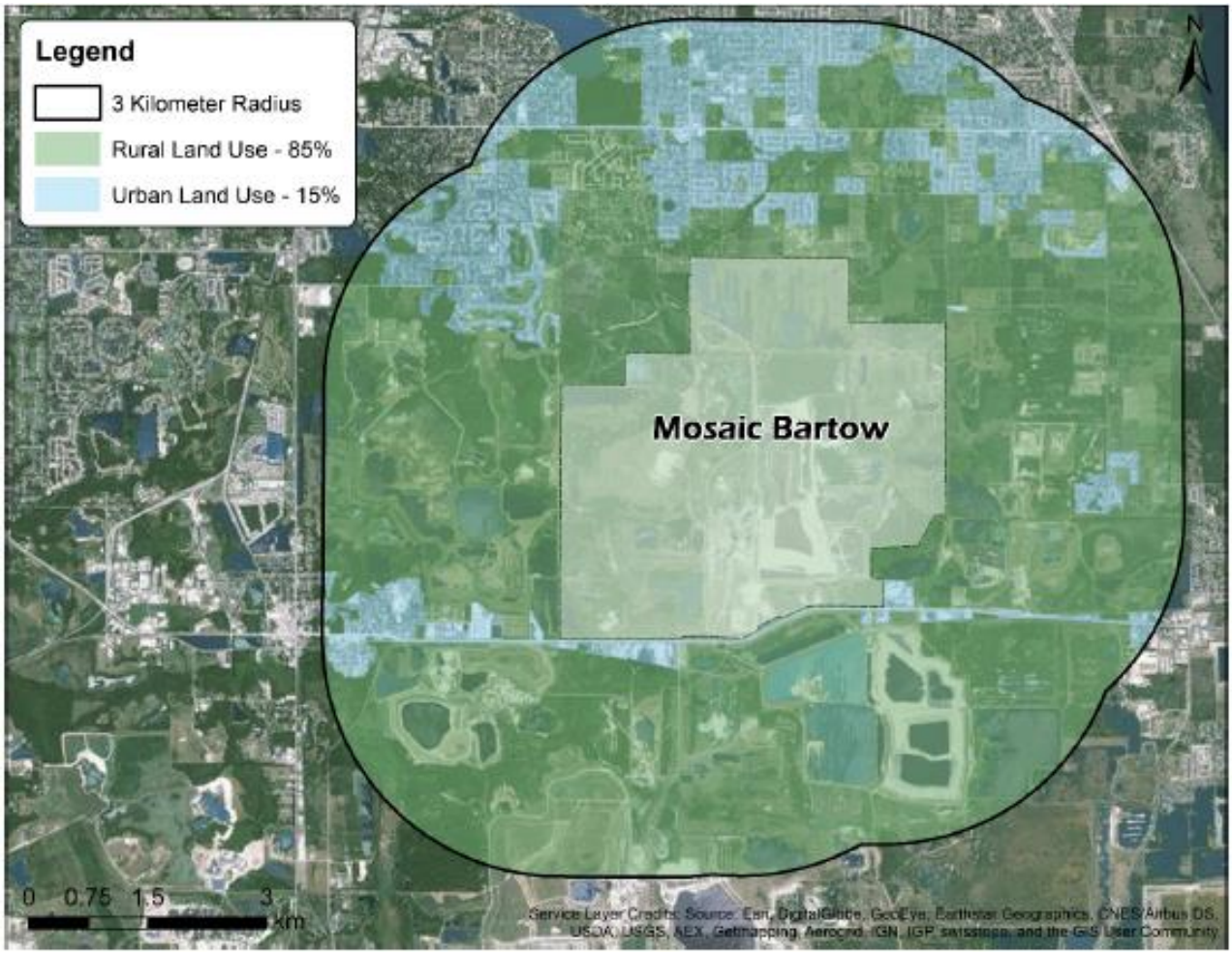
For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode and the EPA concurs with this assessment.

The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. Rural land use constitutes a majority (85 percent) of the 3-km radius around Mosaic Bartow.

The EPA concurs with the State's assessment of the land use near the facility. Figure 10 depicts the land use representation of the Auer method.

Figure 10. Land use for the Mosaic Bartow Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



3.4.2.3.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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area are described in the introduction to this section. For the Polk County area, the State has included five other emitters of SO_2 within 35 km in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to Mosaic Bartow, the other emitters of SO_2 included in the

area of analysis are: Mosaic Fertilizer South Pierce, Mosaic Fertilizer New Wales, Lakeland Electric McIntosh, Wheelabrator Ridge Energy, and TECO Polk Power Station. Florida also assessed other SO_2 emissions sources in the Polk County area. Table 13 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 13. SO_2 Emissions Sources within 35 km of the Mosaic Bartow. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from Mosaic Bartow (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
105-0046	Mosaic Fertilizer Bartow [a,b]	0	0	4,045.72	Yes
105-0234	Duke Hines Energy Complex	14	280	23.72	No
105-0216	Wheelabrator Ridge Energy [a]	15	300	213.77	No
105-0055	Mosaic Fertilizer South Pierce [a]	15	300	1,731.77	Yes
105-0059	Mosaic Fertilizer New Wales [a,b]	15	300	7,126.50	Yes
105-0004	Lakeland Electric McIntosh [a,b]	19	380	2,156.63	Yes
105-0233	TECO Polk Power Station [a]	21	420	1,245.17	Yes
049-0340	Seminole Midulla Station	30	600	5.84	No

a. Explicitly modeled facility.
b. DRR-applicable facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the Mosaic Bartow facility.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The receptor network contained 3,092 receptors, and the network covered the Mosaic Bartow facility. The facility is located in the southwestern portion of Polk County in Florida. The majority of the plant boundary line receptors are on the southern part of the facility. See Table 14 below for receptor description.

Table 14. Dense Receptor Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	SAP 5
Unit UTM Zone	17N
Unit UTM Easting (m)	409,655.34
Unit UTM Northing (m)	3,087,320.67
Actual Stack Height (m)	60.96
Expected Distance to Max Concentration (m)	610
20 Times Stack Height (m)	1,219
100 m Receptor Spacing - Extent from the Origin (m)	2,500
250 m Receptor Spacing - Extent from the Origin (m)	5,000
500 m Receptor Spacing - Extent from the Origin (m)	7,500
Plant Boundary Receptor Spacing (m)	50
Total Receptors	3,092

Figures 11 and 12, included in the State's recommendation, show the State's chosen area of analysis surrounding the Mosaic Bartow, 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 locations that would be considered ambient air relative to each modeled facility, including other facilities' property. The state asserted that, generally, the distance from the source to the area of the maximum ground-level 1-hour impact of SO_2 will be no more than 10 times the source release height. Based on the guidance, the State developed a uniform method for receptor grid placement for all DRR sources in Florida. A dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within Mosaic Bartow's fenceline were removed and receptors were placed with 50 m spacing along the fenceline.

Section 4.2 of the Modeling TAD includes a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. Florida chose not to employ this process and instead included receptors in all areas the State considered ambient air within 7.5 km of Mosaic Bartow. The state also did not place receptors in other locations that it considered to not be ambient air relative to each modeled facility. Figure 12 from the Florida Modeling Report shows the Mosaic Bartow fence line boundary. However, no information was provided in Florida's Modeling Report for the Polk County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[9] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

[9] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 11. Area of Analysis for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

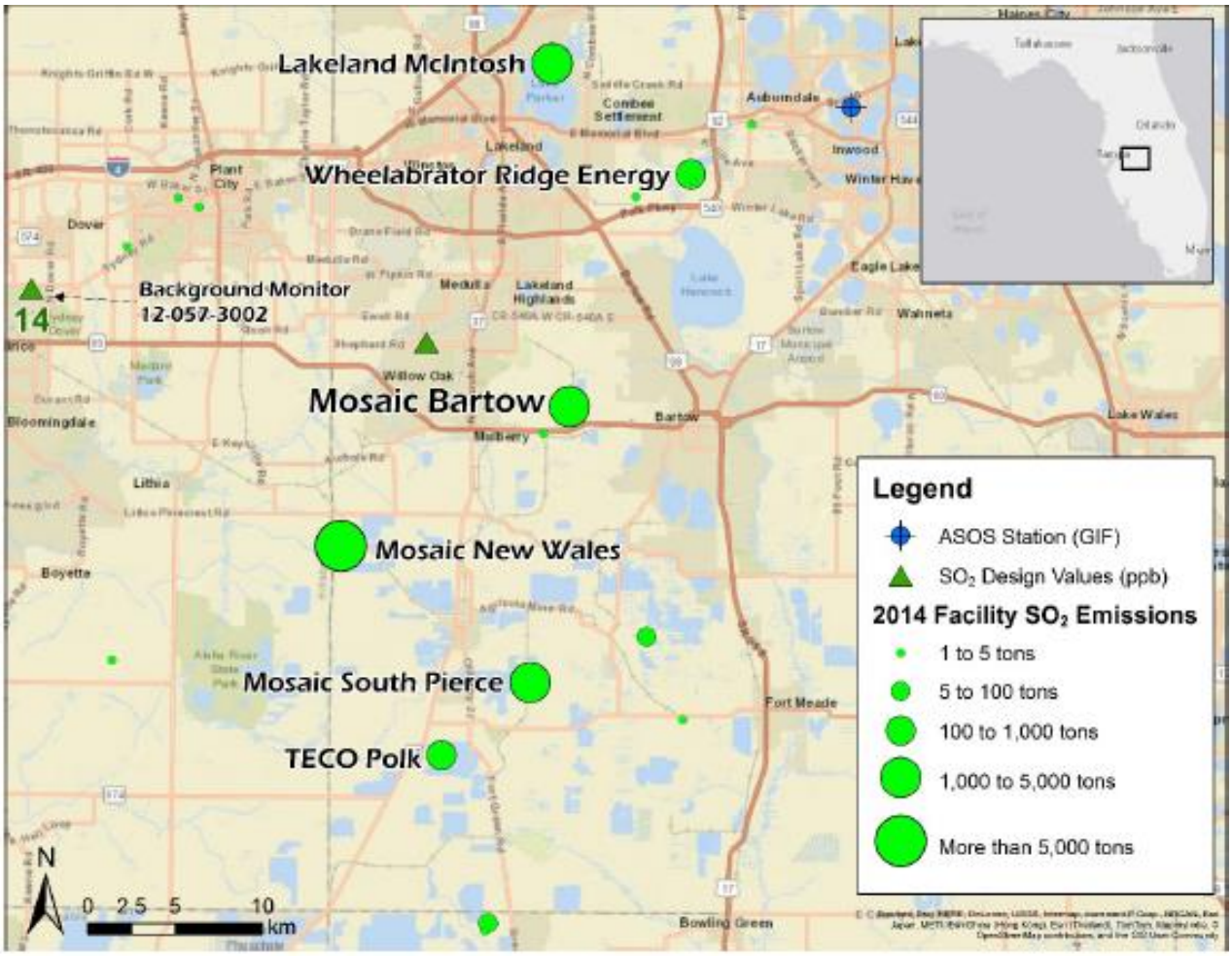
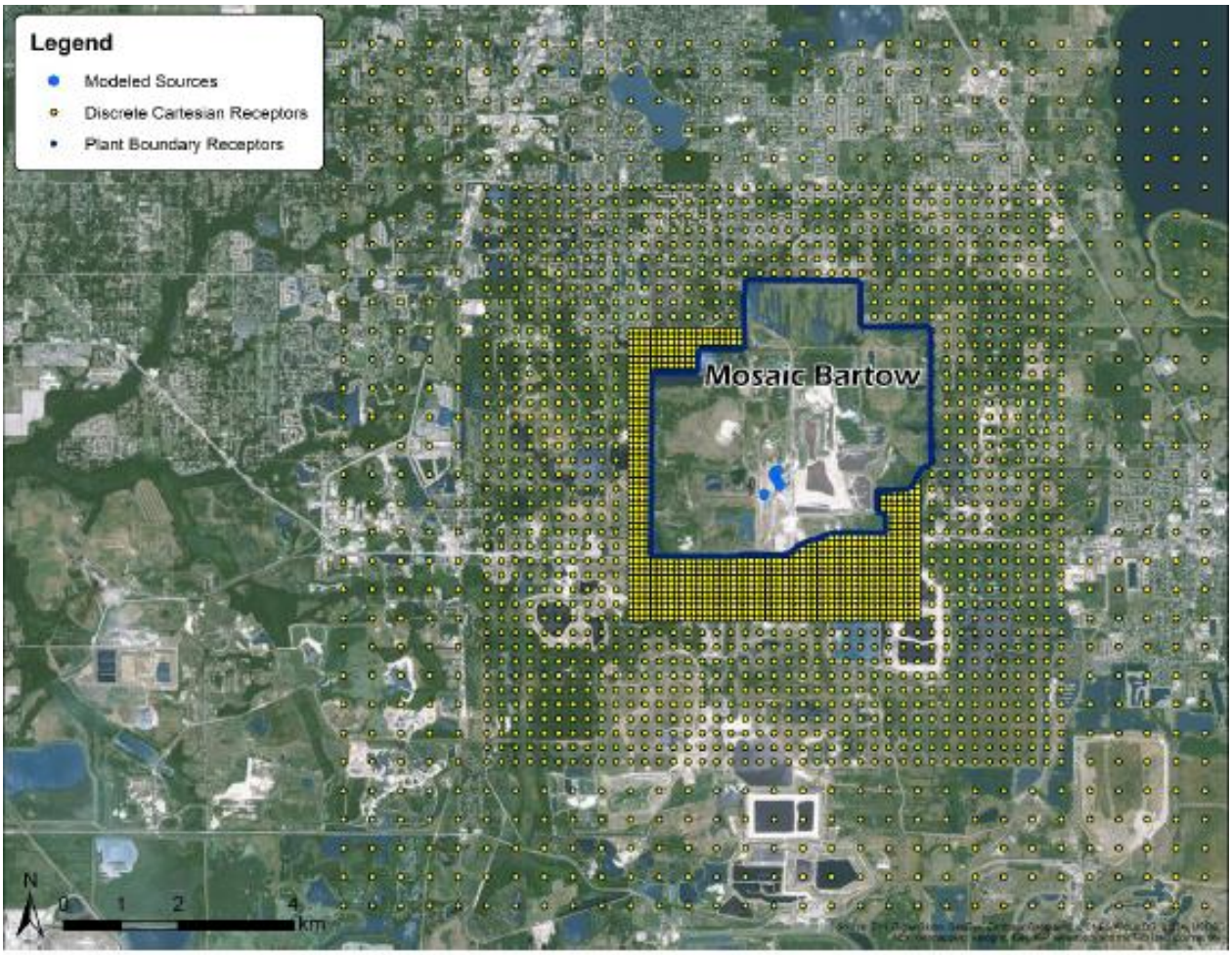


Figure 12. Receptor Grid for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



3.4.2.4.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 State modeled five additional sources outside of Mosaic Bartow. These facilities include: Mosaic Fertilizer South Pierce, Mosaic Fertilizer New Wales, Lakeland Electric McIntosh, Wheelabrator Ridge Energy and TECO Polk Power Station. These facilities were modeled by the State since the sources have a Q/d (emissions/distance) over 20 and they are located within 35 km of Mosaic Bartow. The EPA reviewed all the other sources of SO_2 emissions in the area and determined that due to their distance from the Mosaic Bartow facility and their levels of emissions, they are not likely to have significant concentration gradients or impact the area near Mosaic Bartow. Any potential impacts from the sources not explicitly modeled are accounted for

in the analysis using representative background monitoring data from the Sydney monitor located approximately 31 km west-northwest of the Mosaic Bartow facility.

The State characterized these 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 along with the EPA's GEP policy. 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees with Florida's method for characterizing the sources.

3.4.2.5 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 Mosaic Bartow and five other emitters of SO_2 within 35 km in the area of analysis. For this area of analysis, the State has opted to use a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The facilities in the State's modeling analysis and their associated actual or PTE rates are summarized below.

For the Mosaic Bartow, Mosaic New Wales, Mosaic South Pierce, and Lakeland Electric McIntosh, the State provided annual actual SO_2 emissions from 2012- 2014. This information is summarized in Table 15. A description of how the State obtained hourly emission rates is given below this table.

Table 15. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Area of Analysis for the Polk County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Mosaic Bartow	3,931.25	4,173.72	4,045.72
Mosaic New Wales	7,104.39	7,194.14	7,126.50
Mosaic South Pierce	1,210.11	1,453.97	1,731.77
Lakeland Electric McIntosh	1.88	1.34	0.767
Total Emissions from All Facilities in the Area of Analysis Modeled Based on Actual Emissions	12,247.63	12,823.17	12,904.8

For Mosaic Bartow, Mosaic New Wales, Mosaic South Pierce, and Lakeland Electric McIntosh the actual hourly emissions data were obtained from CEMS. Florida developed actual emissions for included facilities in accordance with the EPA Modeling TAD and used 2012-2014 CEMS data. The EPA agrees with Florida's approach.

For TECO Polk Power Station and Wheelabrator Ridge Energy, the State provided PTE values. Additionally, the State provided PTE for units at Mosaic Bartow and Lakeland Electric McIntosh which do not have CEMS. This information is summarized in Table 16. A description of how the State obtained hourly emission rates is given below this table.

Table 16. SO_2 Emissions based on PTE from Facilities in the Area of Analysis for the Polk County Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
Mosaic Bartow	48
TECO Polk Power Station	13,593
Wheelabrator Ridge Energy	720.77
Lakeland Electric McIntosh	7,212.5
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	21,574.27

Mosaic Bartow included two ammonium phosphate fertilizers plants and a sulfur handling system on-site that contribute a small amount of additional SO_2 emissions. These three units were characterized using their maximum permitted short-term emission rates. TECO Polk included one combined-cycle combustion turbine, four simple-cycle turbines, a small SAP and an emergency flare. All TECO Polk sources were characterized using their maximum permitted short-term emission rates. The TECO Polk emergency flare typically operates less than 150

hours per year; however, it is also the second largest source of SO_2 emissions at this facility. The flare was modeled according to the EPA guidance and using its maximum annual emission rate from the period 2012-2014. Wheelabrator is a small electric generating facility with a single steam generating boiler. This unit was characterized with its maximum permitted short-term emission rate. Lakeland Electric McIntosh modeled their two combustions turbines and one steam generating boiler using maximum permitted short-term emission rates. For the purposes of the DRR, the facility recently obtained a permit for the boiler (Boiler 3) that makes the Mercury and Air Toxics Standard (MATS) SO_2 surrogate limit of 0.20 lb SO_2/MMBtu a federally enforceable limit. This air permit was issued by Florida on November 29, 2016.

The SO_2 emission limits for three of the modeled sources are based on longer-term averaging periods (e.g., 30-day average limits) than the 1-hr SO_2 NAAQS. For these sources, Florida used the EPA guidance methodology to scale the longer-term average emission limit by the ratio of each source's historic 99^{th} percentile one-hour average emission rate to its 99^{th} percentile longer-term average emission rate. This analysis was performed by Florida using CEMS data from 2012 – 2014.

The EPA agrees with Florida's use of actual emissions for most of the emissions units at the Mosaic New Wales, Mosaic Bartow, Mosaic South Pierce and the Lakeland Electric McIntosh facilities. We also agree with the use of permit allowable (PTE) emissions for remaining units at the Mosaic Bartow, TECO Polk Power Station, Wheelabrator Ridge Energy and Lakeland Electric McIntosh facilities. We believe that Florida has provided adequate documentation to show that these emissions for these sources were applied appropriately in the modeling.

3.4.2.6.Modeling Parameter: Meteorology and Surface Characteristics

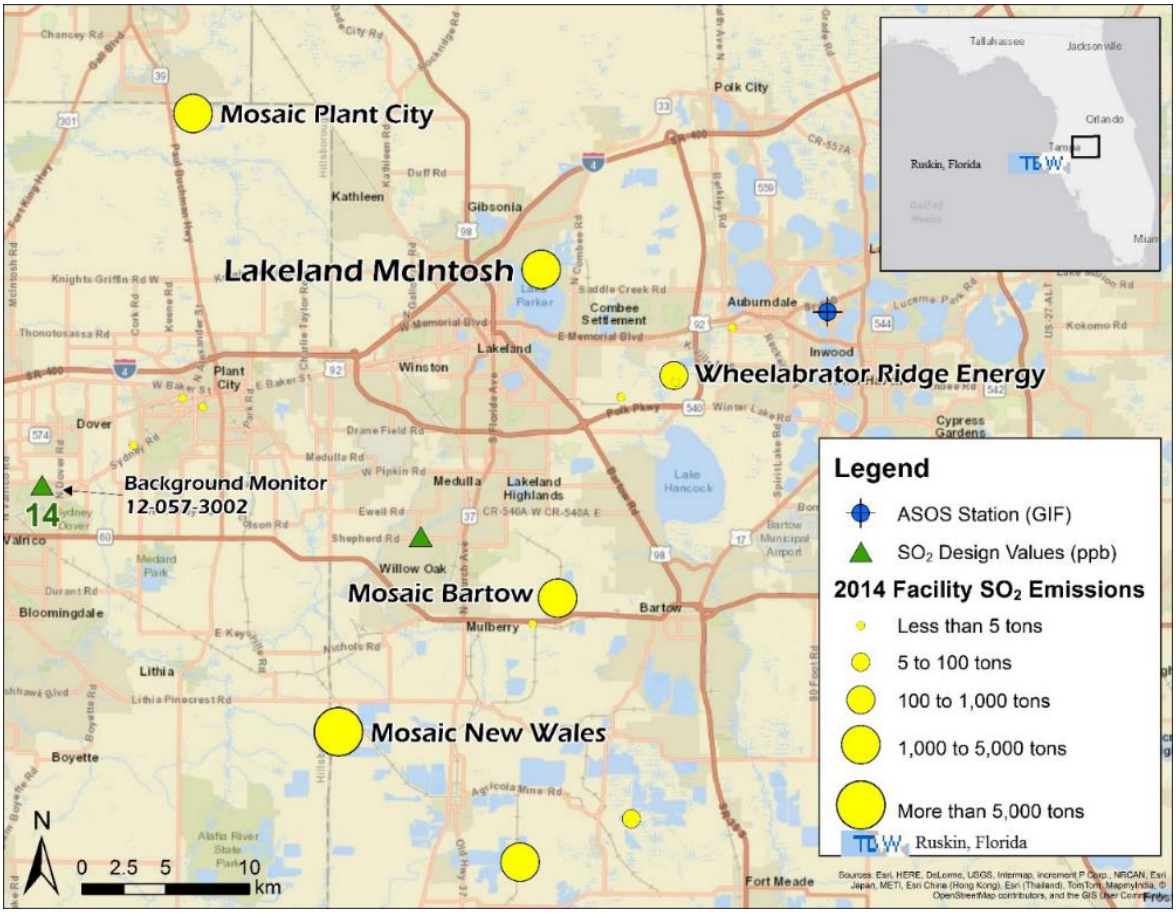
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Polk County, Florida, area, the State selected the surface meteorology from Winter Haven Municipal Airport, located approximately 23 km Northeast of the Mosaic Bartow facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from Winter Haven Municipal 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

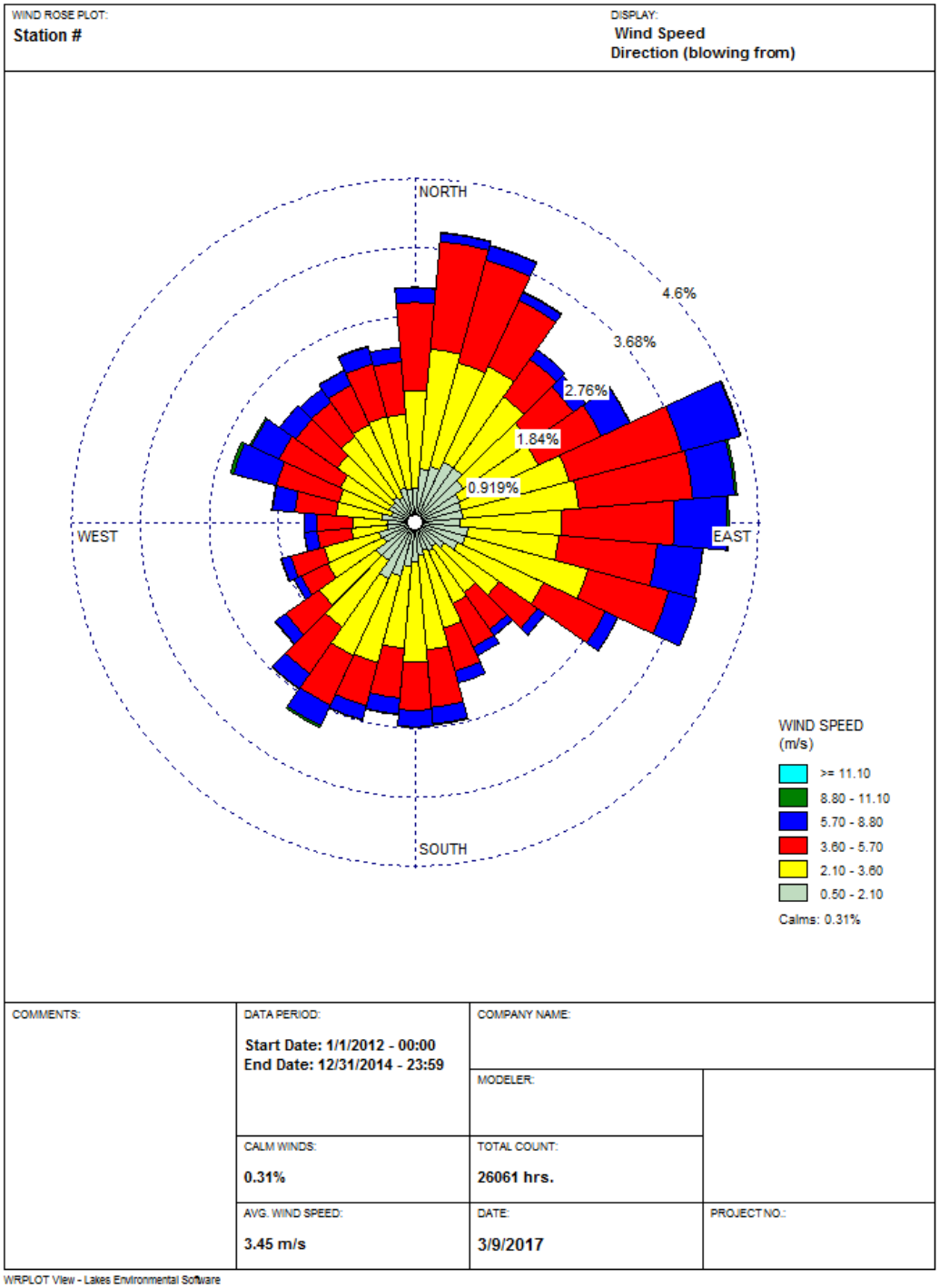
In the figure below, generated by the EPA and Florida, the location of this NWS station is shown relative to the area of analysis.

Figure 13. Area of Analysis and the NWS station in the Polk County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a wind rose for the Winter Haven Municipal Airport for the 2012-14 period. 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 predominately blow from the north and east directions.

Figure 14. Winter Haven Municipal Airport 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 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 Winter Haven Municipal Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Winter Haven Municipal Airport, located approximately 23 km northeast of the Mosaic Bartow facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Mosaic Bartow can be expected to the south of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Winter Have Municipal Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

3.4.2.7.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. 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 1992 National Land Cover Dataset.

While Polk County, Florida is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

3.4.2.8.Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 99^{th} percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002), approximately 31 km west-northwest of the Mosaic Bartow facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from the sources explicitly included in the modeling. In this case, any measurement recorded when the wind direction was from 23° to 174° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. Table 17 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 17. Tier 2 Temporally Varying Background Concentrations from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.33	1.33	1.00	2.33	12:00	3.67	2.67	3.33	3.67
1:00	1.33	1.00	0.67	1.33	13:00	4.33	3.00	3.67	3.33
2:00	1.00	0.67	1.00	1.67	14:00	2.67	2.00	2.67	3.00
3:00	2.33	0.67	1.00	1.00	15:00	2.00	1.33	1.67	2.33
4:00	1.00	0.33	1.00	1.33	16:00	2.67	1.33	1.67	2.33
5:00	1.00	0.33	1.00	1.33	17:00	2.00	1.33	1.33	1.67
6:00	1.33	0.67	2.00	1.67	18:00	2.00	1.00	1.00	1.67
7:00	1.33	1.67	2.00	2.00	19:00	2.00	1.00	0.67	1.33
8:00	2.00	2.67	2.00	4.33	20:00	3.00	1.00	1.33	2.33
9:00	4.33	1.33	2.67	4.00	21:00	2.00	1.67	1.33	2.00
10:00	4.00	1.33	2.00	3.67	22:00	2.00	6.67	7.00	2.00
11:00	2.67	2.00	1.33	3.67	23:00	1.67	2.00	1.33	2.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

3.4.2.9.Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Polk County area of analysis are summarized below in Table 18.

Table 18. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Polk County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory default)
Dispersion Characteristics	Rural
Modeled Sources	25
Modeled Stacks	25
Modeled Structures	28
Modeled Fencelines	1
Total receptors	3092
Emissions Type	Actual
Emissions Years	2012-2014 for actuals.
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Winter Haven Municipal Airport
NWS Station Upper Air Meteorology	Ruskin, Florida
NWS Station for Calculating Surface Characteristics	Winter Haven Municipal Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site # 12-057-3002, Tier 2 based on temporally varying approach.
Calculated Background SO_2 Concentration	Temporally varying

The results presented below in Table 19 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

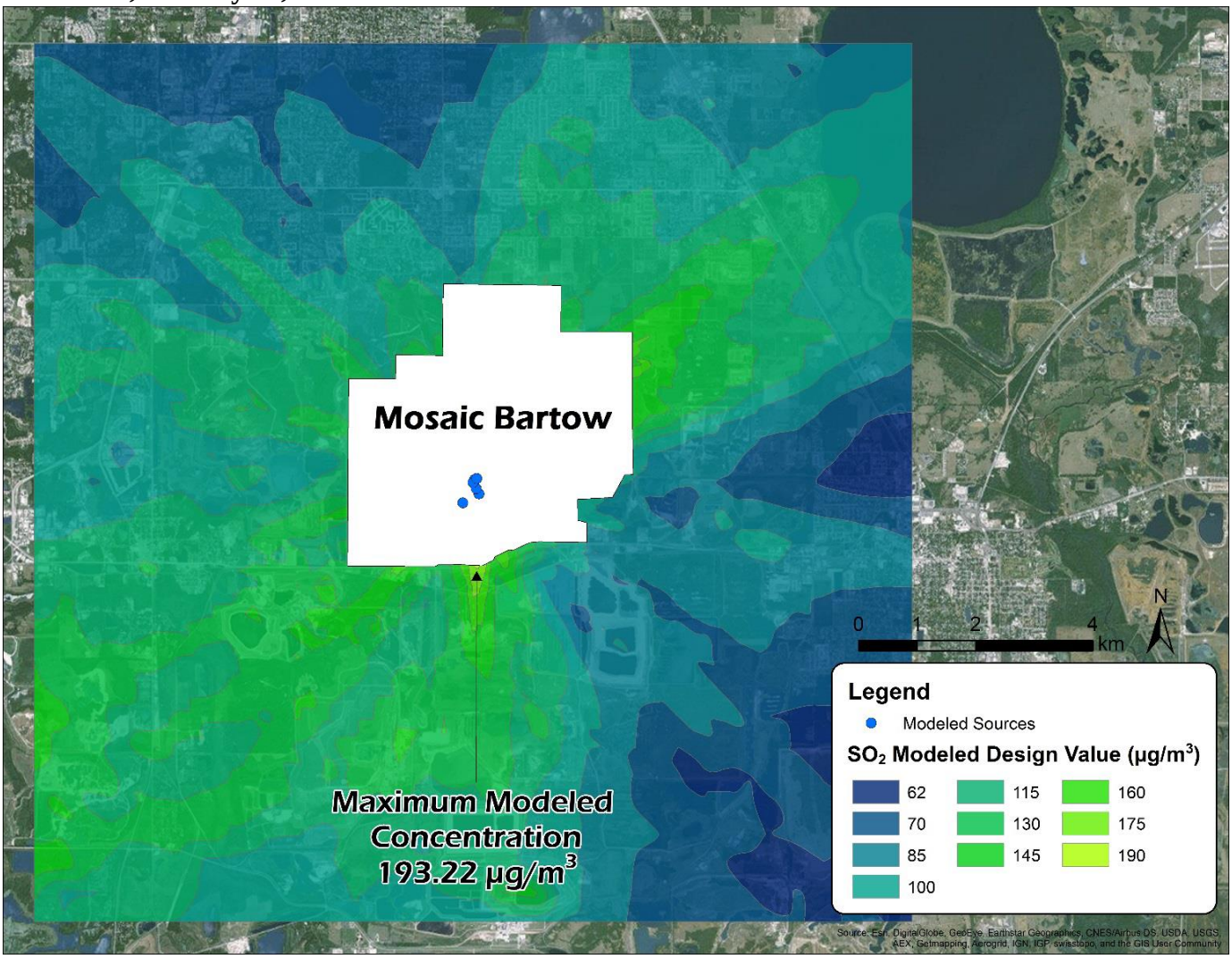
Table 19. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County, Florida Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	409,721.55	3,085,907.82	193.22	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 193.22 µg/m^3, equivalent to 73.78 ppb. This modeled concentration included the background concentration of SO_2, and is based on a mix of actual and allowable emissions from the facilities. Figure 15 below was included as part of the State's recommendation, and indicates that the predicted value occurred south of Mosaic's Bartow facility. The extent of the State's receptor grid is also shown in the figure.

Figure 15. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration.

3.4.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the Mosaic Bartow facility. Given the criteria for selecting nearby sources, we believe that the decision to include five additional sources, Mosaic New Wales, Mosaic South Pierce, Lakeland Electric Plant McIntosh, Wheelabrator Ridge Energy, and TECO Polk Power Station, and excluding all other sources from the modeling analysis was correct. A mix of actual emissions from the 2012-14 period along with permitted allowable emissions for some units were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the Mosaic Bartow facility.

3.5. Air Quality Modeling Analysis for the Polk County Area Addressing Lakeland Electric - C.D. McIntosh, Jr. Power Plant

3.5.1. Introduction

This section 3.5 presents all the available air quality modeling information for a portion of Polk County that includes C.D. McIntosh, Jr. Power Plant (McIntosh). (This portion of Polk County will often be referred to as "the Polk County area" within this section 3.5). This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tpy:

- The McIntosh and Mosaic Fertilizer - Bartow facilities emitted 2,000 tons or more annually. Specifically, McIntosh emitted 2,156.63 tons of SO_2 in 2014 and Mosaic Bartow emitted 4,046 tons of SO_2 in 2014. These sources meet the DRR criteria and thus are on the SO_2 DRR Source list, and Florida has chosen to characterize them via modeling.

- The Wheelaborator Ridge Energy and Mosaic Fertilizer Plant City facilities do not emit 2,000 tons or more annually, but were included in the modeling assessment.

In its submission, Florida recommended that an area that includes the area surrounding the facility, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and

Nassau Counties, based in part on an assessment and characterization of air quality impacts from this facility and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. 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 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.

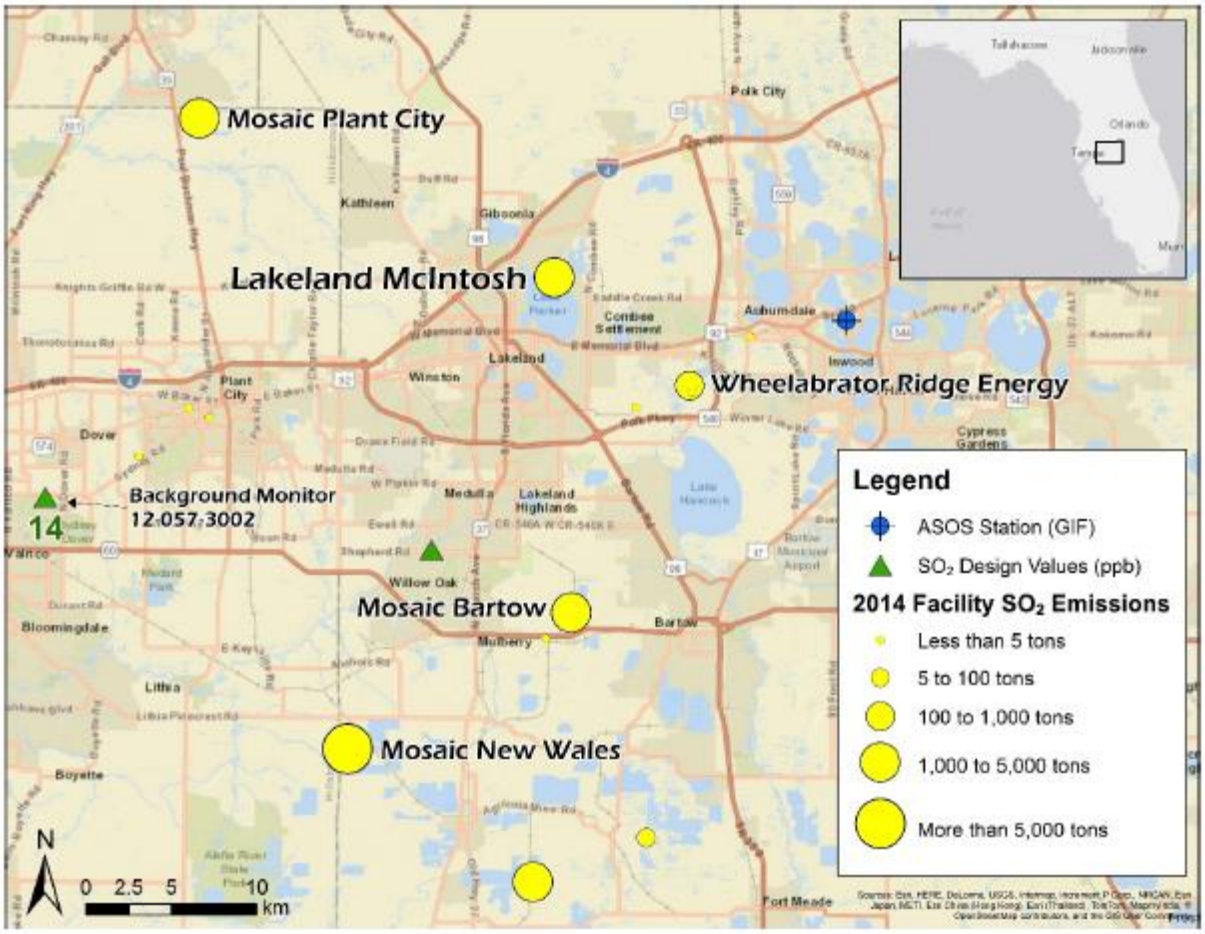
The area that the State has assessed via air quality modeling is located in the City of Lakeland near Lake Parker.

As seen in Figure 16 below, the McIntosh facility is located adjacent to Lake Parker near the Bowling Green Lake Parker Park.

Also included in the figure are other nearby emitters of SO_2.[10] These are Mosaic Fertilizer Bartow, Wheelabrator Ridge Energy, Mosaic Fertilizer Plant City, and Mosaic Fertilizer New Wales, all located in Polk County.

[10] All other SO_2 emitters of 2,000 tpy or more (based on information provided by the State of Florida are shown in Figure 16. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

Figure 16. Map of the Polk County Area Addressing McIntosh. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two different modeling assessments, including two assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 20. Modeling Assessments for the Polk County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida DEP	01/13/2017	Polk County-Lakeland Modeling Report	Report
Florida DEP	06/30/2016	Florida Modeling Protocol	Protocol

3.5.2. Modeling Analysis Provided by the State

The State submitted modeling for McIntosh with the DRR modeling protocol to the EPA in June 2016. After review, the EPA had no initial concerns with the modeling that was provided. The Polk County- Lakeland Modeling Report submitted in January 2017 does not show any significant changes from the protocol. The inputs, model versions, or assessments were similar in both documents. The conclusions provided in the protocol are similar to the assessment of the report. The Polk County- Lakeland Modeling Report from the State is primarily used in this TSD, but other details from the protocol may be relevant.

3.5.2.1.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

3.5.2.2.Modeling Parameter: Rural or Urban Dispersion

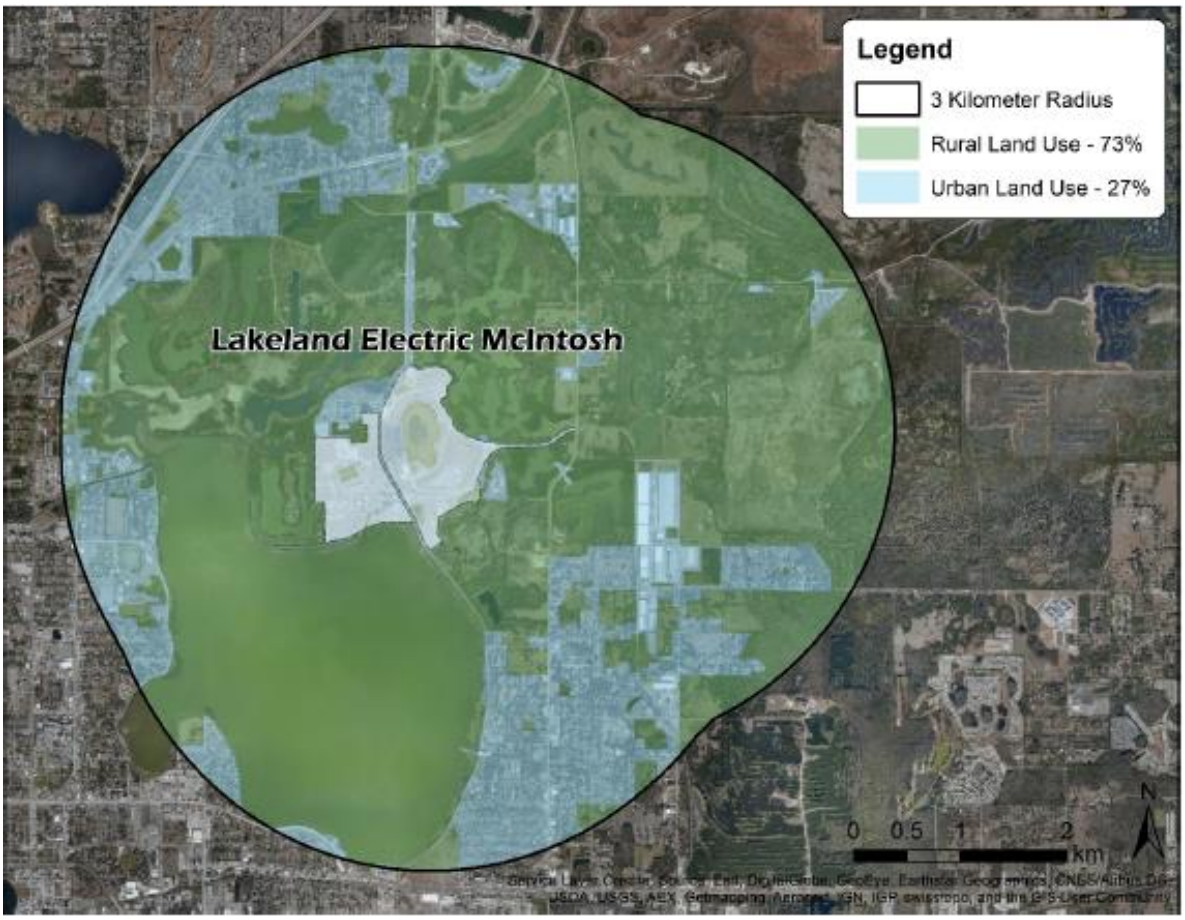
For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. Rural land use constitutes a majority (73 percent) of the 3-km radius around McIntosh.

The EPA concurs with the State's assessment of the land use. Figure 17 depicts the land use representation of the Auer method.

Figure 17. Land use for the McIntosh Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



3.5.2.3.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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Polk County area, the State has included three other emitters of SO_2 within 35 km of McIntosh in any direction. The State determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to McIntosh, the other emitters of SO_2 included in the area of analysis are: Mosaic Fertilizer Bartow, Wheelabrator Ridge Energy, and Mosaic

Fertilizer Plant City. Florida also assessed other SO_2 emissions sources in the Polk County area. Table 21 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 21. SO_2 Emissions Sources within 35 km of the Lakeland Energy McIntosh Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from McIntosh (km) (d)	20d	2014 SO_2 Emissions (tons)	Q > 20d
105-0004	Lakeland Electric McIntosh [a]	0	0	2,156.63	Yes
105-0216	Wheelabrator Ridge Energy [a]	10	200	213.77	Yes
105-0046	Mosaic Fertilizer Bartow [a,b]	19	380	4,045.72	Yes
057-0005	Mosaic Fertilizer Plant City [a]	24	480	1,784.01	Yes
105-0059	Mosaic Fertilizer New Wales [b]	30	600	7,126.50	Yes
105-0234	Duke Hines Energy Complex	33	660	23.72	No
105-0055	Mosaic Fertilizer South Pierce	33	660	1,731.77	Yes

a. Explicitly modeled facility.
b. DRR-applicable facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and/or are located large distances from the McIntosh facility.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500m intervals. Receptors located within McIntosh's fenceline were removed and receptors were placed with 50 m spacing along the fenceline.

The receptor network contained 4,472 receptors, and the network covered the entirety of the facility.

Table 22. Dense Receptor Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Unit 5
Unit UTM Zone	17N
Unit UTM Easting (m)	408,848.00
Unit UTM Northing (m)	3,106,897.00
Actual Stack Height (m)	91.40
Expected Distance to Max Concentration (m)	914
20 Times Stack Height (m)	1,828
100 m Receptor Spacing - Extent from the Origin (m)	2,500
250 m Receptor Spacing - Extent from the Origin (m)	5,000
500 m Receptor Spacing - Extent from the Origin (m)	7,500
Plant Boundary Receptor Spacing (m)	50
Total Receptors	4,472

Table 23. Nested Receptor Grid Description. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
UTM Zone	17N
SW Corner UTM Easting (m)	399,848.00
SW Corner UTM Northing (m)	3,111,897.00
Total East-West Extent (m)	2,000
Total North-South Extent (m)	3,000
Receptor Spacing (m)	100
Total Receptors	651

Figures 18 and 19, included in the State's recommendation, show the State's chosen area of analysis surrounding the McIntosh facility, as well as the receptor grid for the area of analysis.

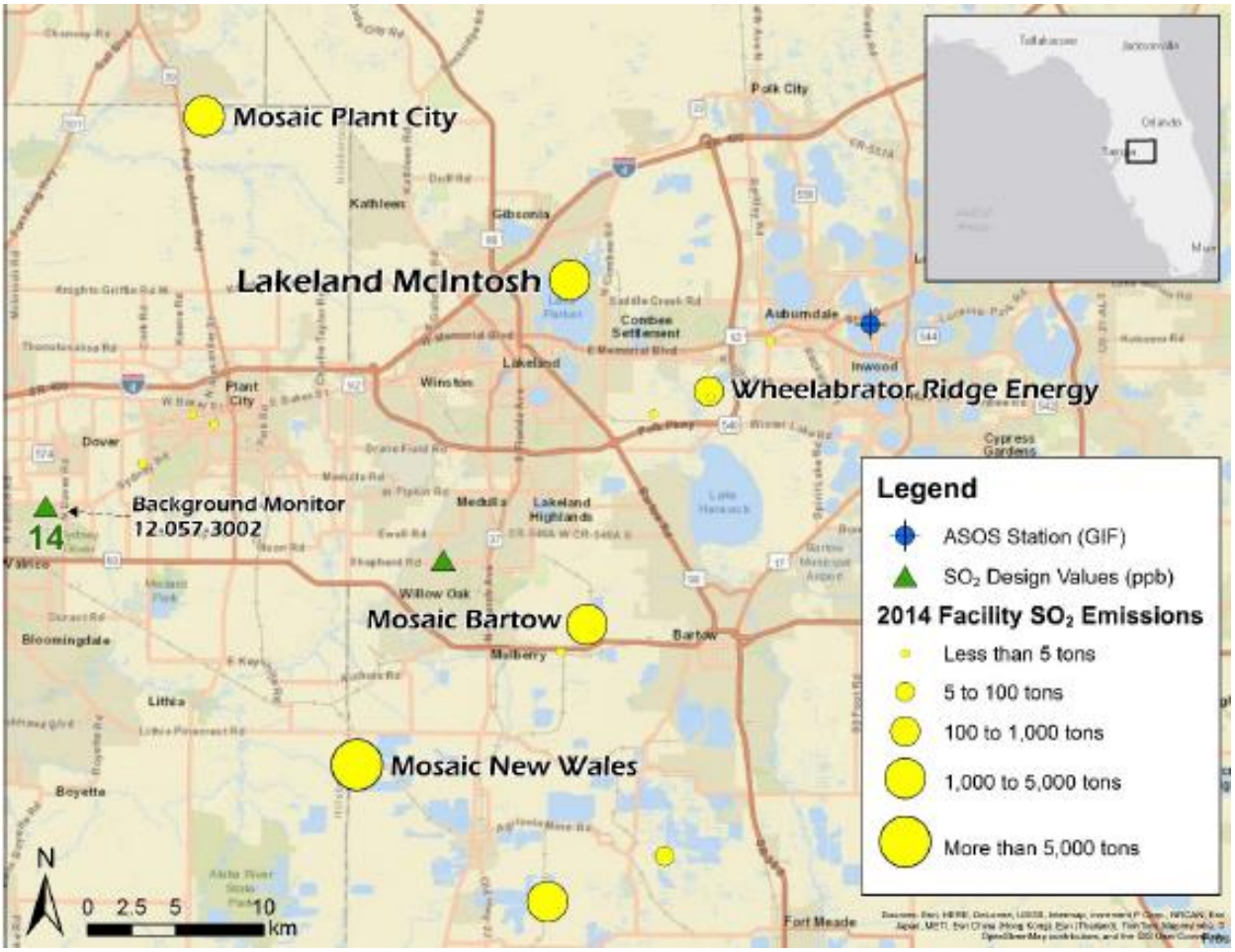
Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property. Initial modeling indicated that high concentrations were found in an area of insufficiently dense receptor placement near the northwest corner of the receptor grid. Accordingly, an additional nested grid of receptors with 100 m spacing was placed in this area to fully resolve the highest concentrations. The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The State chose not to employ this process and instead included receptors in all areas the State asserted were ambient air within 7.5 km of McIntosh.

Figure 19 from the Florida Modeling Report shows the McIntosh fence line boundary. However, no information was provided in Florida's Modeling Report for the Polk County area to document that public access to the facility property is prevented by a fence or some other physical barrier.

The EPA contacted Florida regarding this issue. Florida responded via email[11] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

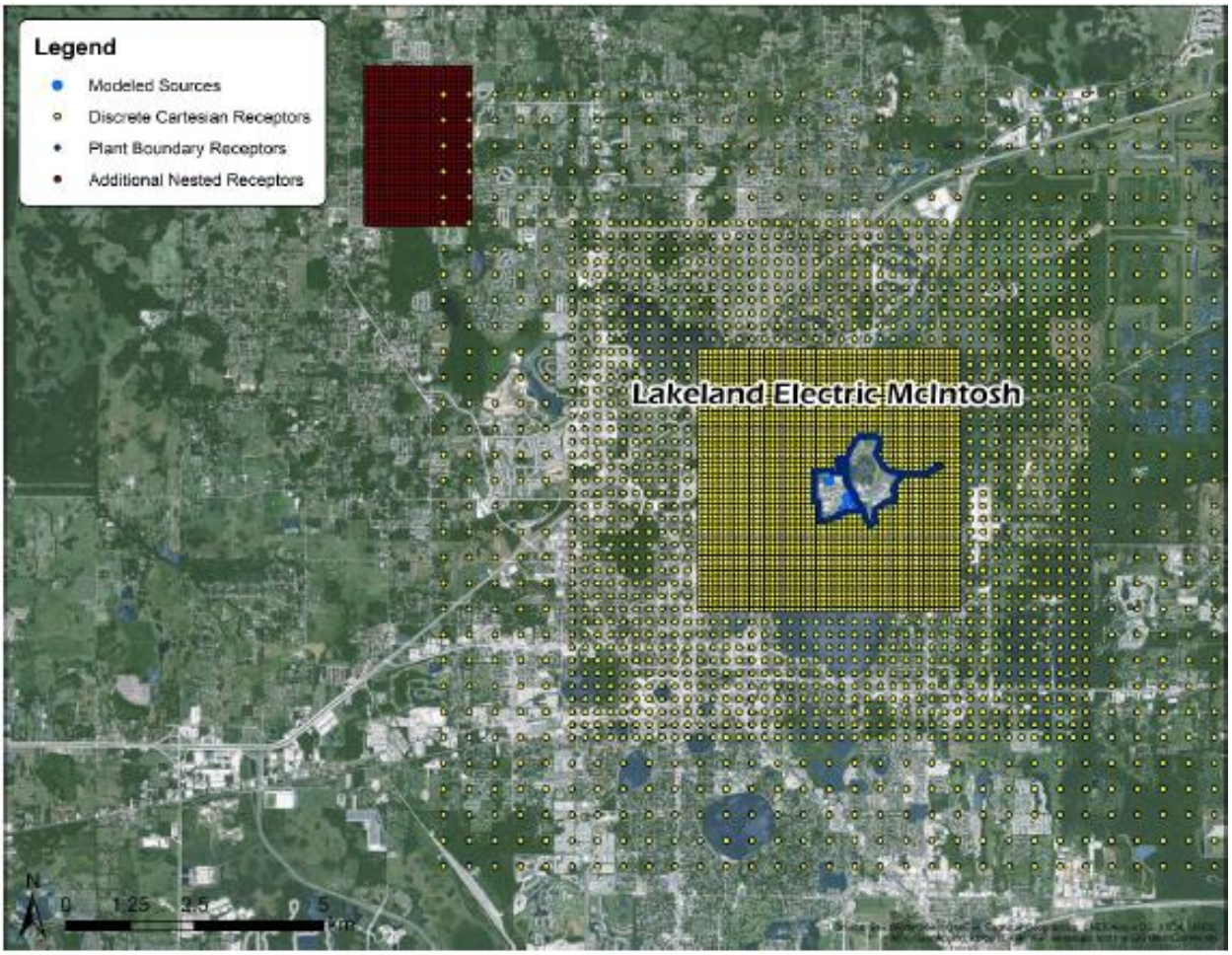
After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 18. Area of Analysis for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[11] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 19. Receptor Grid for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



3.5.2.4.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.

Along with McIntosh, the State modeled Mosaic Fertilizer Bartow, Wheelabrator Ridge Energy, and Mosaic Fertilizer Plant City. These facilities were modeled since the sources have a Q/d (emissions/distance) over 20 and are located within 35 km of Mosaic Bartow. The facility that had emissions over 2,000 tons (Bartow) is a modeled DRR source. EPA reviewed all the other sources of SO_2 emissions in the area and determined that due to their distance from the McIntosh facility and their levels of emissions, they are not likely to have significant concentration gradients or impact the area near McIntosh. Any potential impacts from the sources not explicitly modeled are accounted for in the analysis using representative background monitoring data from the Sydney monitor located approximately 33 km southwest of the McIntosh facility.

The State characterized these 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 along with the EPA's GEP policy. 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 BPIPPRM was used to assist in addressing building downwash.

3.5.2.5.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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 three other emitters of SO_2 within 35 km in the area of analysis. For this area of analysis, the State has opted to use a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The facilities in the State's modeling analysis and their associated actual or PTE rates are summarized below.

For one unit at McIntosh, the State provided annual actual SO_2 emissions between 2012 and 2014. This information is summarized in Table 24. A description of how the State obtained hourly emission rates is given below this table.

Table 24. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Polk County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Lakeland Electric McIntosh	1.88	1.34	0.767
Total Emissions from Facilities in the Area of Analysis	1.88	1.34	0.767

For Lakeland Electric McIntosh, the actual hourly emissions data were obtained from CEMS. Florida developed actual emissions using the EPA Modeling TAD and used 2012-2014 CEMS data. The EPA agrees with Florida approach.

For the remaining units at Lakeland Electric McIntosh, Mosaic Bartow, Mosaic Plant City and Wheelabrator Ridge Energy, the State provided PTE values. This information is summarized in Table 23. A description of how the State obtained hourly emission rates is given below this table.

Table 25. SO_2 Emissions based on PTE from Facilities in the Polk County Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
Lakeland Electric McIntosh	7,212.5
Mosaic Bartow	5,817.12
Mosaic Plant City	3,641.19
Wheelabrator Ridge Energy	720.77
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	17,391.58

Lakeland Electric McIntosh modeled their two combustions turbines and one steam generating boiler using maximum permitted short-term emission rates. For the purposes of this DRR, the facility recently obtained a permit for the boiler (Boiler 3) that makes the MATS SO_2 surrogate limit of 0.20 lb SO_2/MMBtu a federally enforceable limit. This air permit was issued by Florida on November 29, 2016. Mosaic Bartow included three sulfuric acid plants (SAPs) that were characterized using their maximum permitted short-term emission rates. Mosaic Plant City included four SAPs that were modeled using their maximum permitted short-term emission rates. Wheelabrator is a small electric generating facility with a single steam generating boiler. This unit was characterized with its maximum permitted short-term emission rate.

The SO_2 emission limits for several of the modeled sources are based on longer-term averaging (e.g., 30-day average limits) periods than the 1-hr SO_2 NAAQS. For these sources, Florida used the EPA guidance methodology to scale the longer-term average emission limit by the ratio of each source's historic 99th percentile one-hour average emission rate to its 99th percentile longer-term average emission rate. This analysis was performed by Florida using CEMS data from 2012 – 2014.

The EPA agrees with Florida's use of actual emissions for one of the emissions units at the Lakeland Electric McIntosh facility. We also agree with the use of permit allowable (PTE) emissions for remaining units at the Lakeland Electric McIntosh, Mosaic Bartow, Mosaic Plant City and Wheelabrator Ridge Energy facilities. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

3.5.2.6.Modeling Parameter: Meteorology and Surface Characteristics

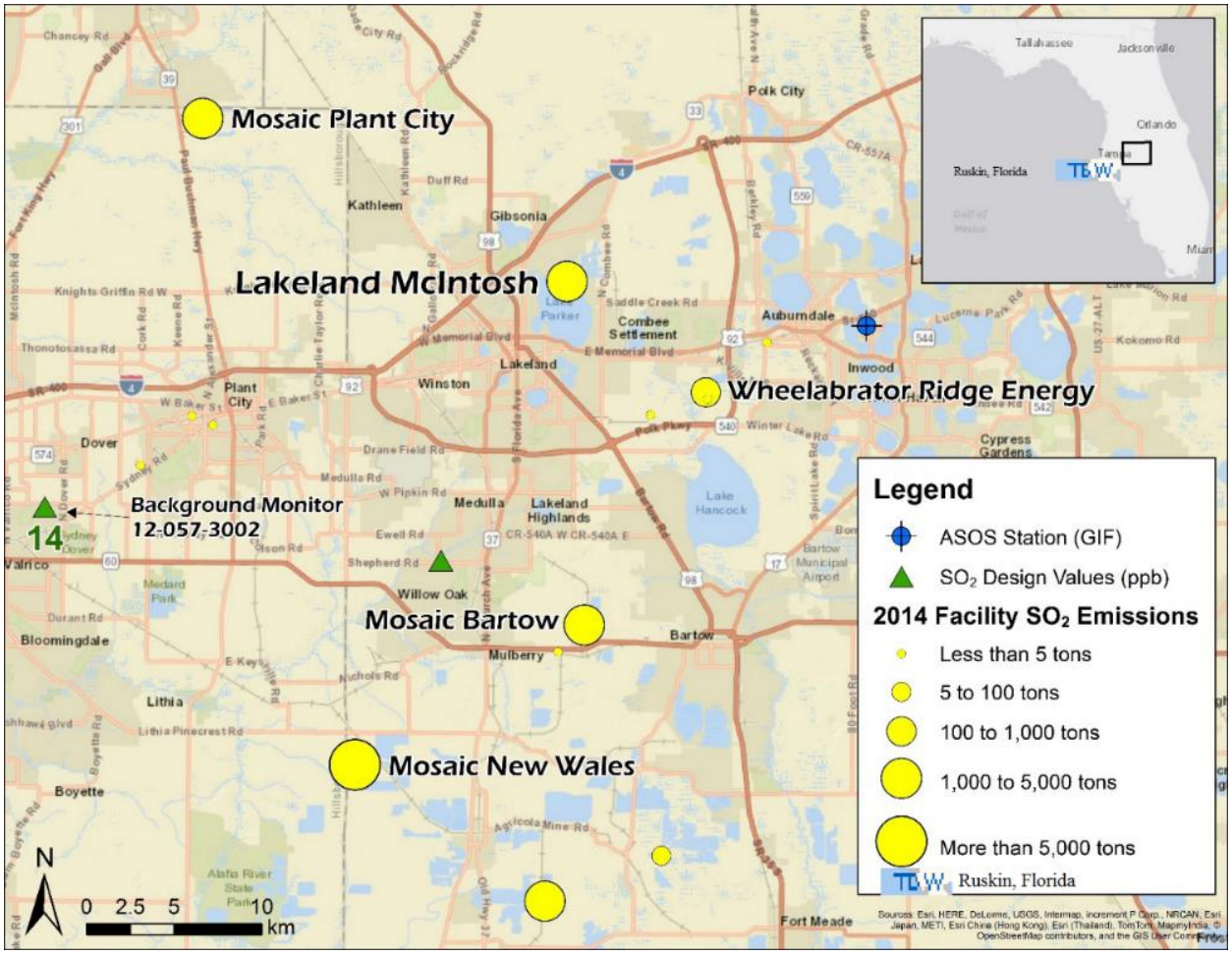
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Polk County, Florida, area, the State selected the surface meteorology from Winter Haven Municipal Airport, located approximately 16 km east of the McIntosh facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis.

The State used AERSURFACE version 13016 using data from Winter Haven Municipal 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

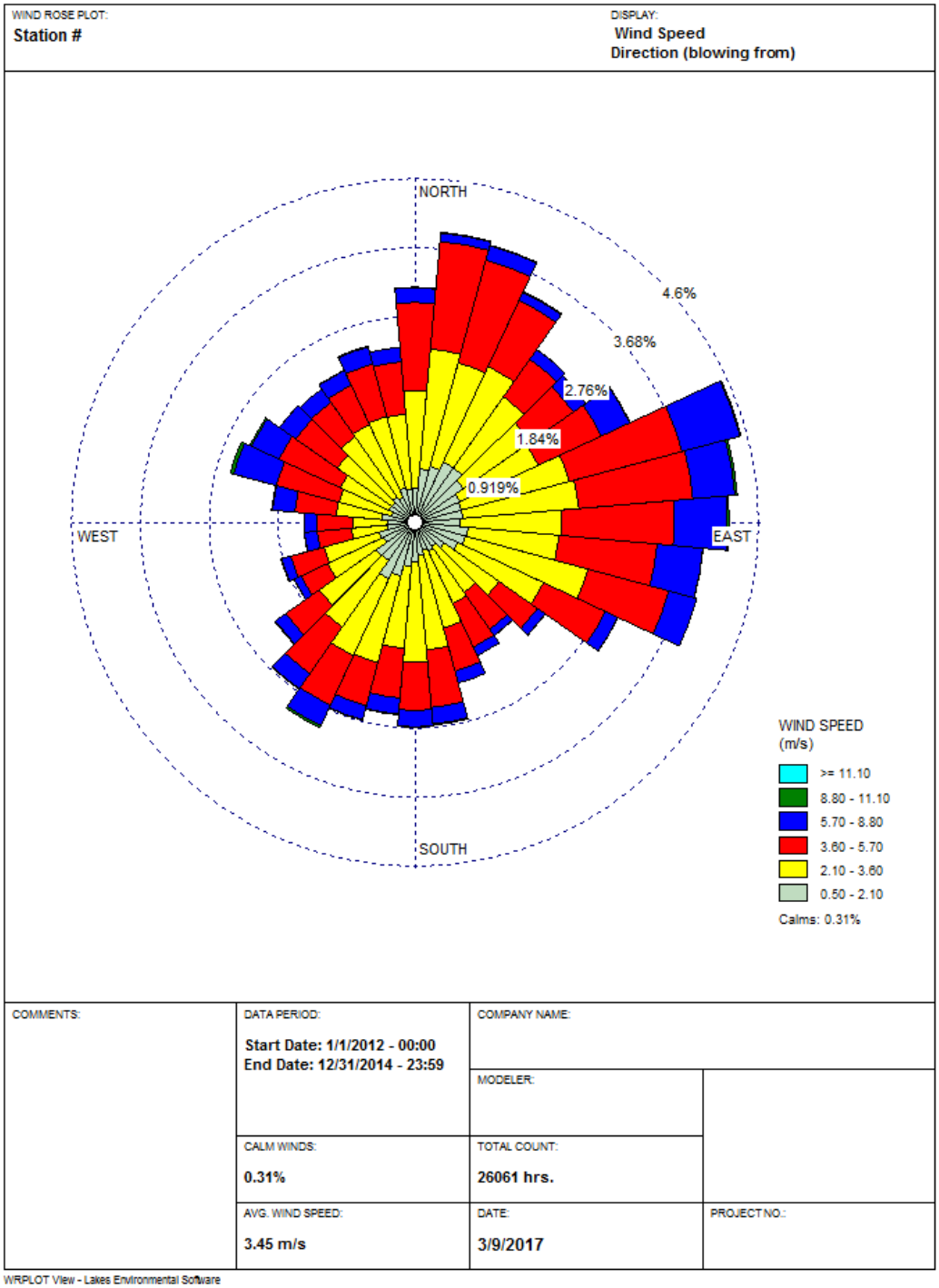
In the figure below, generated by the EPA and the State, the location of this NWS station is shown relative to the area of analysis.

Figure 20. Area of Analysis and the NWS station in the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a wind rose for the Winter Haven Municipal Airport for the 2012-14 period. In Figure 21, 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 predominately blow from the north and east directions.

Figure 21. Winter Haven Municipal Airport 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 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 Winter Haven Municipal Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Winter Haven Municipal Airport, located approximately 16 km east of the McIntosh facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from McIntosh can be expected to the northwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Winter Have Municipal Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

3.5.2.7.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. 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 source of the elevation data incorporated into the model is from the 1992 National Land Cover Dataset.

While Polk County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

3.5.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 99^{th} percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002), approximately 33 km southwest of the McIntosh facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from the sources explicitly included in the modeling. In this case, any measurement recorded when the wind direction was from 23° to 174° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. Table 26 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 26. Tier 2 Temporally Varying Background Concentrations from the Sydney monitor (AQS Site: AQS site ID # 12-057-3002.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.33	1.33	1.00	2.33	12:00	3.67	2.67	3.33	3.67
1:00	1.33	1.00	0.67	1.33	13:00	4.33	3.00	3.67	3.33
2:00	1.00	0.67	1.00	1.67	14:00	2.67	2.00	2.67	3.00
3:00	2.33	0.67	1.00	1.00	15:00	2.00	1.33	1.67	2.33
4:00	1.00	0.33	1.00	1.33	16:00	2.67	1.33	1.67	2.33
5:00	1.00	0.33	1.00	1.33	17:00	2.00	1.33	1.33	1.67
6:00	1.33	0.67	2.00	1.67	18:00	2.00	1.00	1.00	1.67
7:00	1.33	1.67	2.00	2.00	19:00	2.00	1.00	0.67	1.33
8:00	2.00	2.67	2.00	4.33	20:00	3.00	1.00	1.33	2.33
9:00	4.33	1.33	2.67	4.00	21:00	2.00	1.67	1.33	2.00
10:00	4.00	1.33	2.00	3.67	22:00	2.00	6.67	7.00	2.00
11:00	2.67	2.00	1.33	3.67	23:00	1.67	2.00	1.33	2.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

3.5.2.9.Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Polk County area of analysis are summarized below in Table 27.

Table 27. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Polk County Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory default)
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	4
Modeled Structures	20
Modeled Fencelines	1
Total receptors	11,460
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Cedar Key Coastal-Marine(CDRF-1) Hernando County Airport (BKV)
NWS Station Upper Air Meteorology	Ruskin, Florida (TBW)
NWS Station for Calculating Surface Characteristics	Cedar Key Coastal-Marine(CDRF-1)
Methodology for Calculating Background SO_2 Concentration	12-017-0006 Season by Hour option in AERMOD
Calculated Background SO_2 Concentration	Temporally varying

The results presented below in Table 28 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

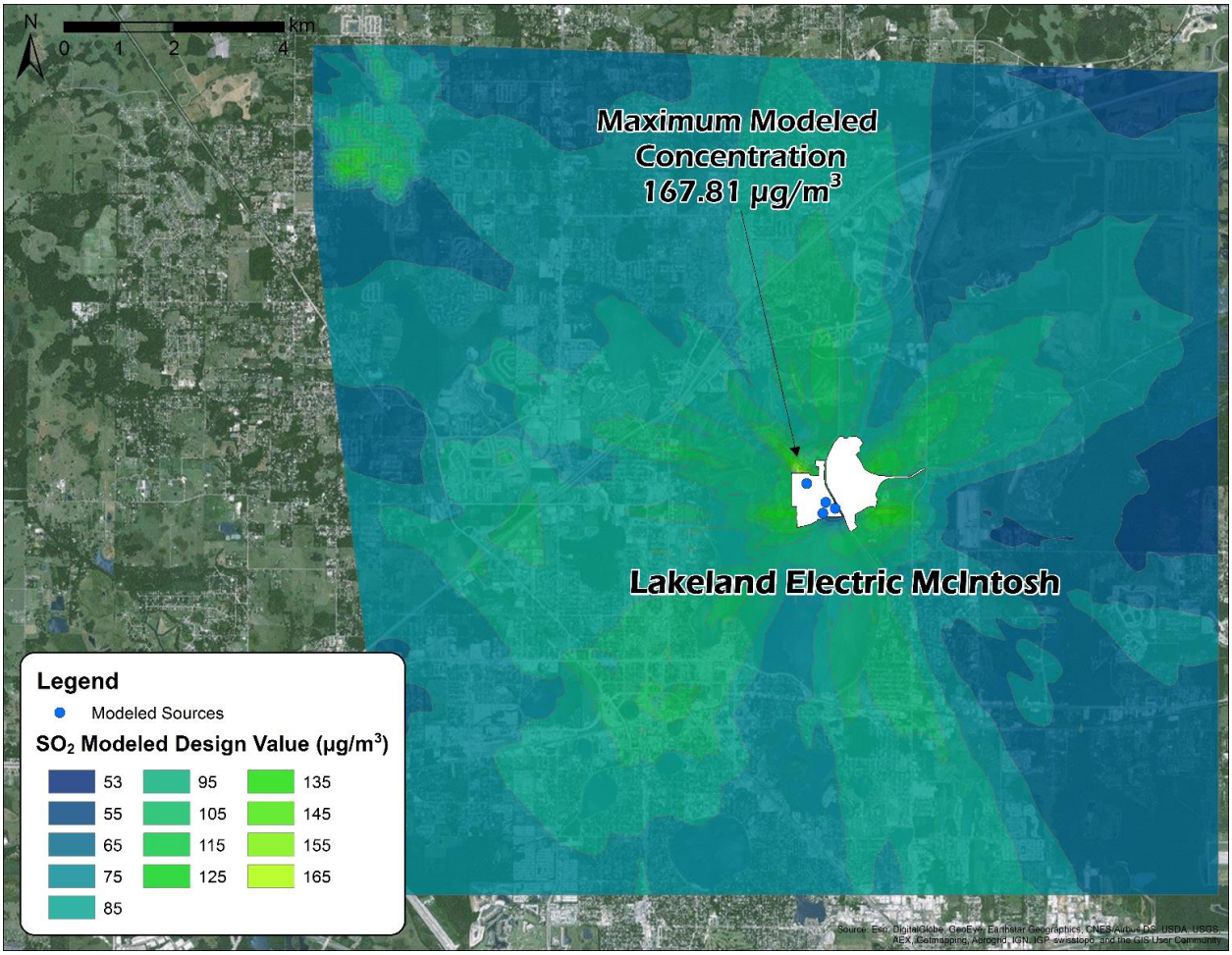
Table 28. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012- 2014	408848	3106897	167.81	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 167.81 $\mu g/m^3$, equivalent to 62.83 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual emissions from the facilities. Figure 22 below was included as part of the State's recommendation, and indicates that the predicted value occurred just north of the McIntosh facility. The State's receptor grid is also shown in the figure.

Figure 22. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Polk County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration.

3.5.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the Lakeland Energy Plant McIntosh facility. Given the criteria for selecting nearby sources, we believe that the decision to include three additional sources (Mosaic Bartow, Mosaic Plant City, and Wheelabrator Ridge Energy), and excluding all other sources from the modeling analysis was correct. A mix of actual emissions from the 2012-14 period along with permitted allowable emissions for some units were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the McIntosh facility.

3.6. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Polk 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.

3.7. Jurisdictional Boundaries in the Polk County Area

Florida did not provide any jurisdictional information for Hillsborough and Polk Counties. The EPA did not use any jurisdictional information in the intended designation action. This factor did not play a role in the EPA's analysis.

3.8. Other Information Relevant to the Designations for the Polk County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Polk County. In section 4.1 of Appendix K of its January 13, 2017, submission, Florida states that Mosaic Fertilizer is currently implementing SO_2 reduction projects at its New Wales, Bartow, and South Pierce facilities in connection with settlement discussions between Mosaic Fertilizer and the EPA, which are expected to be memorialized in a consent decree. Additionally, in section 4.1 of Appendix K of its January 13, 2017, submission, Florida states that Mosaic recently received a permit from the State authorizing upgrades to the catalysts in the five sulfuric acid plants at the New Wales facility. As stated in its January 13, 2017, submission, Florida expects these catalyst upgrades will enable the New Wales facility to

meet the new, significantly more stringent SO_2 emission limits that will be imposed by the anticipated consent decree, as stated in section 4.1 of Appendix K of its January 13, 2017, submission. Included in the permit is an expedited schedule for the implementation of these upgrades beginning in January 2017. In December 2016, the State finalized emission limits for the New Wales facility based on this work that will result in modeled attainment for the Polk County area.

3.9. The EPA's Assessment of the Available Information for the Polk County Area

The EPA has identified a NAAQS violation based on the modeling results submitted by Florida that generally followed the Modeling TAD, as detailed above in Section 3.3.

The EPA believes that our intended nonattainment area, bounded by the area of modeled violation in a portion of Polk County surrounding the Mosaic – New Wales facility (encompassing receptors with modeled nonattainment only) and eastern portion of Hillsborough County (based on modeled violations associated with the Mosaic – New Wales facility,) will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended nonattainment area. Additionally, not enough information is available for the EPA to determine the possibility of contribution from the Mosaic Bartow facility to the modeled violations near the Mosaic New Wales facility.

3.10. Summary of Our Intended Designation for the Polk 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 Hillsborough - Polk, Florida, area as nonattainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of the area of modeled violation in Polk County surrounding the Mosaic – New Wales facility (encompassing receptors with modeled nonattainment only) and eastern portion of Hillsborough County (based on modeled violations.) Specifically, the UTM coordinates for the vertices are: UTM Zone 17N, NAD 1983. The boundary is defined by:

Northwest Corner: 390550.78 E, 3084458.25 N
Northeast Corner: 400300.78 E, 3081958.25 N
Southeast Corner: 400300.78 E, 3074708.25 N
Southwest Corner: 390550.78 E, 3073458.25 N.

In addition, the EPA intends to designate portions of Hillsborough and Polk Counties associated with the Mosaic Bartow facility as unclassifiable for the 2010 SO_2 NAAQS due to the uncertainty regarding possible contribution from the Mosaic Bartow facility to the modeled violations near the Mosaic New Wales facility. The boundary is defined by starting with Northwest Corner and proceeding to the northeast:

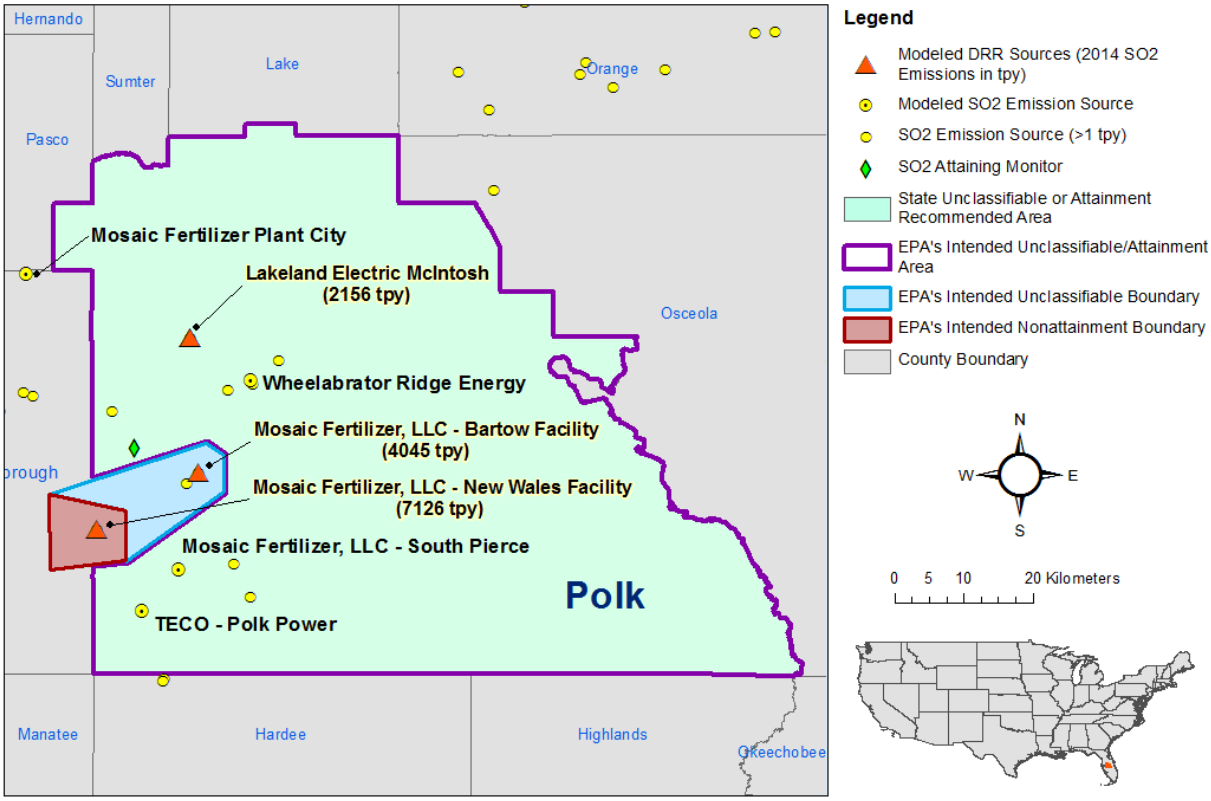
390550.78 E, 3084458.25 N
410655.34 E, 3091570.75 N

412905.34 E, 3089820.75 N
412905.34 E, 3084570.75 N
400300.78 E, 3074708.25 N
400300.78 E, 3081958.25 N.

EPA's intended partial county nonattainment and unclassifiable boundary is consistent with the approach Florida used in their recommendations for Hillsborough and Nassau partial county areas in the Round 1 designations in 2013. Figure 23 shows the boundary of this intended designated area.

Florida has recommended a designation of attainment or unclassifiable for Hillsborough and Polk Counties. EPA regulations for implementing the SO_2 NAAQS require Florida to characterize SO_2 air quality in each listed area. In considering Florida's recommendation, we have taken into account all available information, including any current (2014-2016) air monitoring data, and any air dispersion modeling analyses provided by Florida or by a third party. The air monitoring data are consistent with your recommendation. The air dispersion modeling data, however, show either that portions of Hillsborough and Polk Counties may be violating the 2010 primary SO_2 NAAQS or contain sources that may be contributing to air quality in a nearby area that may be violating the 2010 primary SO_2 NAAQS, which would require a modification of the recommended designation. We invite Florida to review the available information and further discuss this issue with the EPA in order to inform an appropriate final designation.

Figure 23. Boundary of the Intended Hillsborough - Polk, FL Nonattainment and Unclassifiable Area



4. Technical Analysis for the Citrus County Area

4.1. Introduction

The EPA must designate the Citrus County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Citrus County.

4.2. Air Quality Monitoring Data for the Citrus County Area

This factor considers the SO_2 air quality monitoring data in the area of Citrus County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in the AQS database and found the following nearby data:

- The Crystal River Preserve SO_2 monitor (AQS ID: 12-017-0006) is located at 28.9586436101, -82.6429652127 in Citrus County. The monitor is located 3.4 miles east of Duke Energy Florida Crystal River Power Plant (CRPP). Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent SO_2 levels are violating the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data from this monitor (2014-2016) indicate a violating 1-hr SO_2 design value of 81 ppb. This monitor was not located to characterize the maximum 1-hr SO_2 concentrations near CRPP or the area. Florida also provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area near CRPP under the DRR (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Citrus County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

4.3. Air Quality Modeling Analysis for the Citrus County Area Addressing Duke Energy Florida Crystal River Power Plant

4.3.1. Introduction

This section 4.3 presents all the available air quality modeling information for a portion of Citrus County that includes CRPP (This portion of Citrus County will often be referred to as "the Citrus County area" within this section 4.3.) This area contains the following SO_2 CRPP, principally the sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tpy:

- CRPP emitted 2,000 tons or more annually. Specifically, Crystal River Power Plant emitted 32,545.10 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list Florida has chosen to characterize it via modeling.

In its submission, Florida recommended that an area that includes the area surrounding CRPP, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties. The recommendation is 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 is modifying the State's recommendation for the area and intends to designate a portion of the area as nonattainment based on the 2014 – 2016 monitoring data. 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 on the western coast line of the State of Florida.

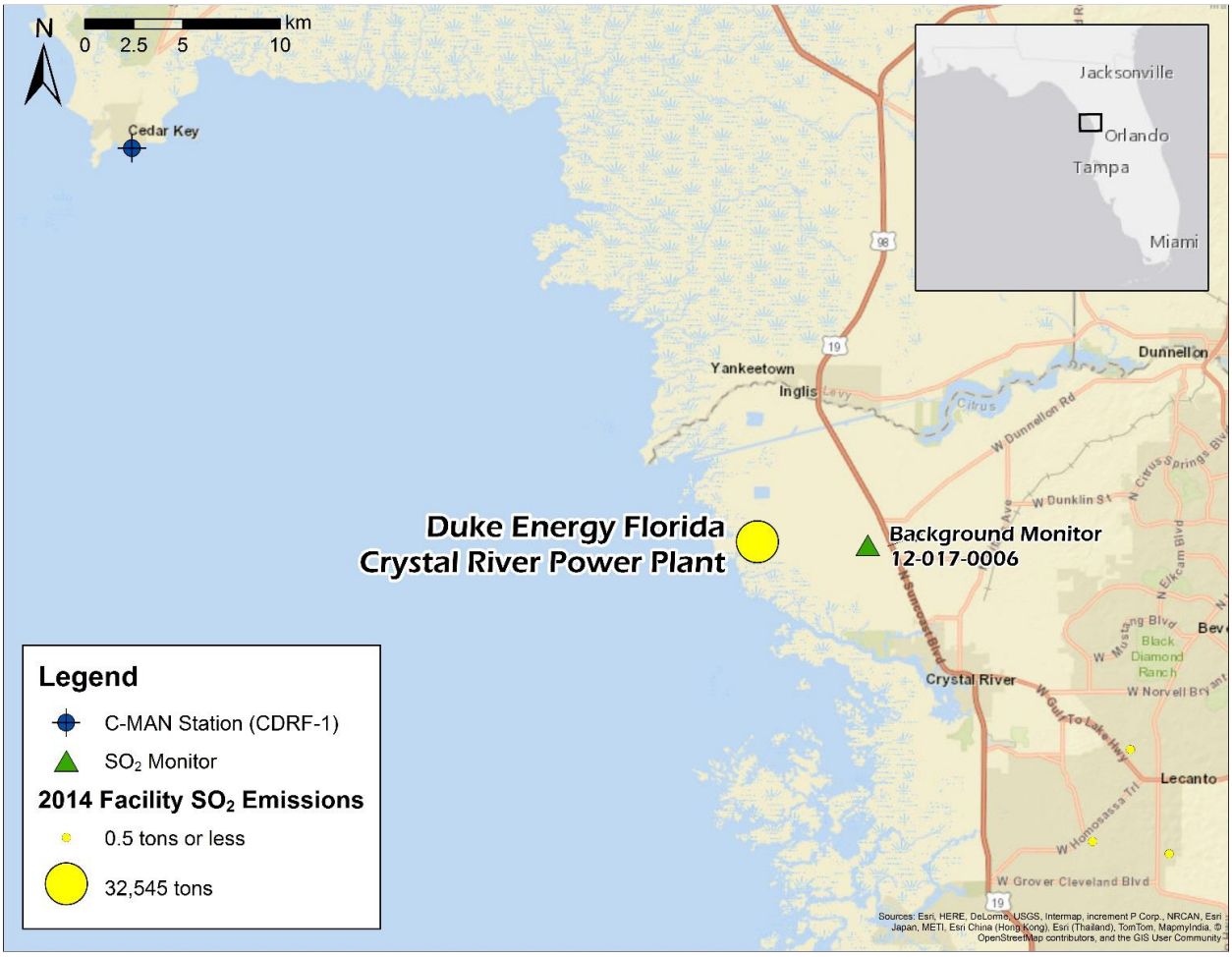
As seen in Figure 24 below, CRPP is located on the western coast line of Florida in the City of Crystal River. The facility is adjacent to Rocky Creek.

Also included in the figure are other nearby emitters of SO_2.[12] These are Precision Grading, Florida Gas Transmission Station 26, and Central Materials. The other sources near CRPP are within 35 km and still within Citrus County.

The EPA's intended nonattainment designation boundary for the Citrus County area is not shown in this figure, but is shown in a figure in the section below that summarizes our intended designation.

[12] All other SO_2 emitters of 0.5 tpy or less based on information provided by the State of Florida are shown in Figure 24. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source.

Figure 24. Map of the Citrus City, Florida Area Addressing CRPP. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two modeling assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 29. Modeling Assessments for the Citrus County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	1/13/2017	Citrus County Modeling Report	Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

4.3.2. Modeling Analysis Provided by the State

The State of Florida submitted modeling protocol documents on June 30, 2016, to the EPA for review. The State submitted the Citrus County Modeling Report on January 13, 2017, with minor changes from the protocol. There are no differences in the State's conclusions from the two documents. After a review of the Modeling Report, the EPA notified the State that they had deviated from the typical approach for modeling two of their coal units. The primary issue is that Florida adjusted to 2012-2014 actual hour emissions for coal-fired boiler units 1 & 2 to account for current operational changes, specifically that two units are currently burning low-sulfur coal. Florida reduced each hour of emissions in the 2012-2014 period by the average reduction resulting from the fuel switch to burning low-sulfur coal. The EPA believes that this use of "simulated actual emissions" is not consistent with a technical analysis to show that the area is attaining the NAAQS, and this issue was communicated to Florida. The EPA also suggested that the modeling be revised to either use three years of non-modified actual emissions or current allowable limits for Units 1 & 2. No additional modeling has been received from Florida to address these issues.

4.3.2.1.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

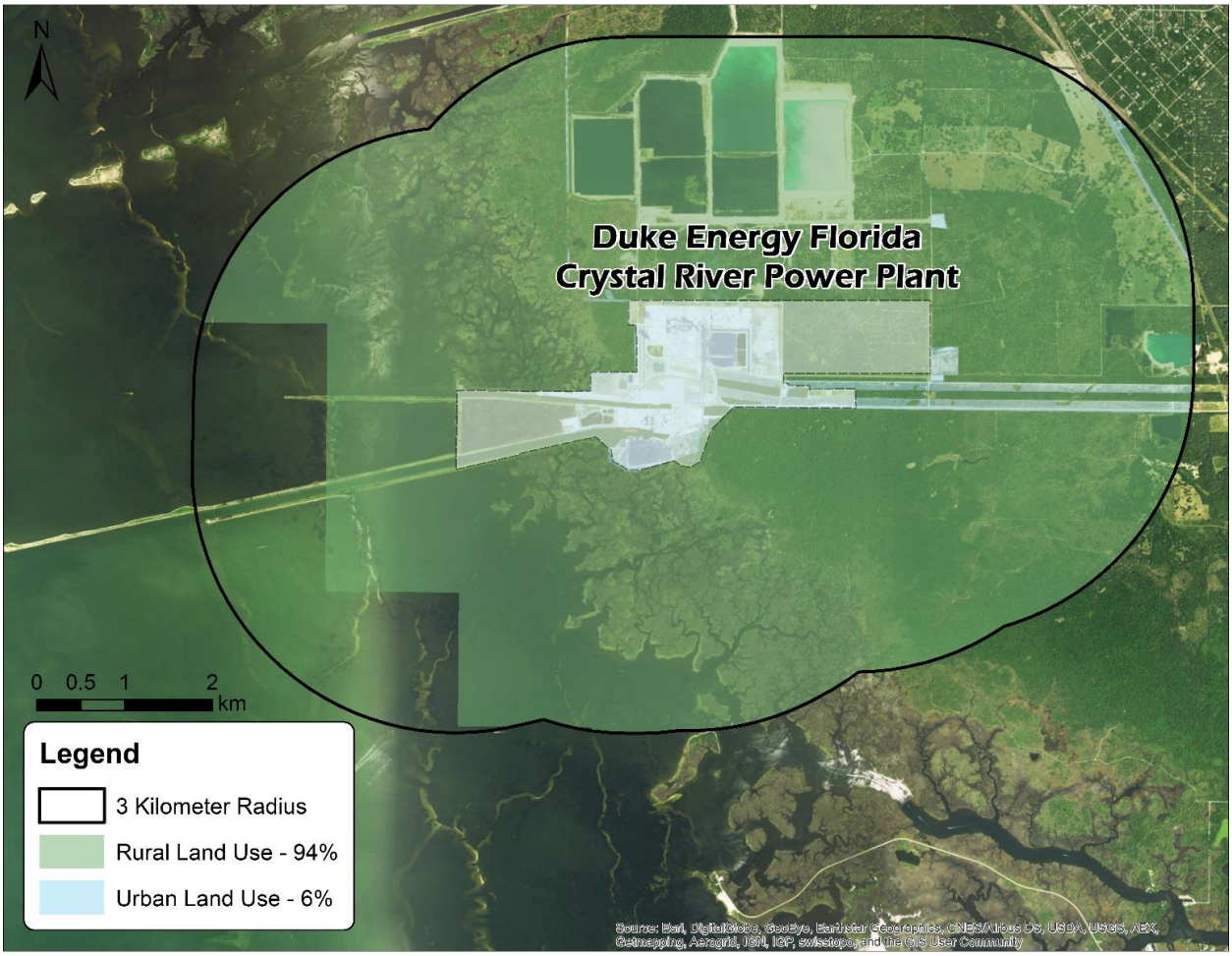
At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

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 SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode. AERMOD contains different dispersion coefficients for rural and urban settings. Appendix W outlines two methods for determining whether the area should be considered rural or urban. The State chose the land-use classification approach, by employing Auer's method. Rural land use constitutes a majority (94 percent) of the 3-km radius around CRPP as seen in Figure 25. Auer's method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used.

Figure 25. Land use around Crystal River Power Plant. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



From the above information the State chose to perform the modeling for the area of analysis in rural mode and the EPA agrees with Florida's assessment in this respect.

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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Citrus County area, the State has considered all emitters of SO_2 within 35 km of CRPP in any direction. All other sources within 35 km of CRPP emitted less than 1 ton of

SO_2 in 2014 and are represented in the added monitored background concentrations. The State determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. Florida also assessed other SO_2 emissions sources in the Citrus County area. Table 30 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 30. SO_2 Emissions Sources within 35 km of the Crystal River Power Plant. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from CRPP (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
017-0004	Duke CRPP	0	0	32,545.10	Yes
017-0364	Precision Grading	23	460	0.08	No
017-0035	Florida Gas Transmission Station 26	20	400	0.50	No
017-0021	Central Materials	25	500	0.14	No

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the CRPP.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The State developed a dense grid of receptors placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500-meter intervals. Receptors located within CRPP's fence line were removed and receptors were placed with 50-m spacing along the fence line. Receptor grid parameters are listed in Table 31.

Table 31. Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Units 4 & 5 Stack
Unit UTM Zone	17N
Unit UTM Easting (m)	334,780.00
Unit UTM Northing (m)	3,205,567.00
Actual Stack Height (m)	167.60
Expected Distance to Max Concentration (m)	1,676
20 Times Stack Height (m)	3,352
100 m Receptor Spacing - Extent from the Origin (m)	5,000
250 m Receptor Spacing - Extent from the Origin (m)	6,500
500 m Receptor Spacing - Extent from the Origin (m)	8,000
Plant Boundary Receptor Spacing (m)	50
Total Receptors	11,460

The receptor network contained 11,460 receptors, and the network covered the northeastern portion of Citrus County in Florida completely surrounding the facility.

Figures 26 and 27, included in the State's recommendation, represents the State's chosen area of analysis surrounding CRPP, 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 locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

Initial modeling indicated that high concentrations were found in areas of insufficiently dense receptor placement. Accordingly, the grid was expanded to fully resolve the highest concentrations. The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The Department chose not to employ this process, but instead included receptors in all areas that the State considered ambient air, within 8 km of CRPP. Figure 27 from the Florida Modeling Report shows CRPP fence line boundary. However, no information was provided in Florida's Modeling Report for the Citrus County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[13] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

[13] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 26. Area of Analysis for the Citrus County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

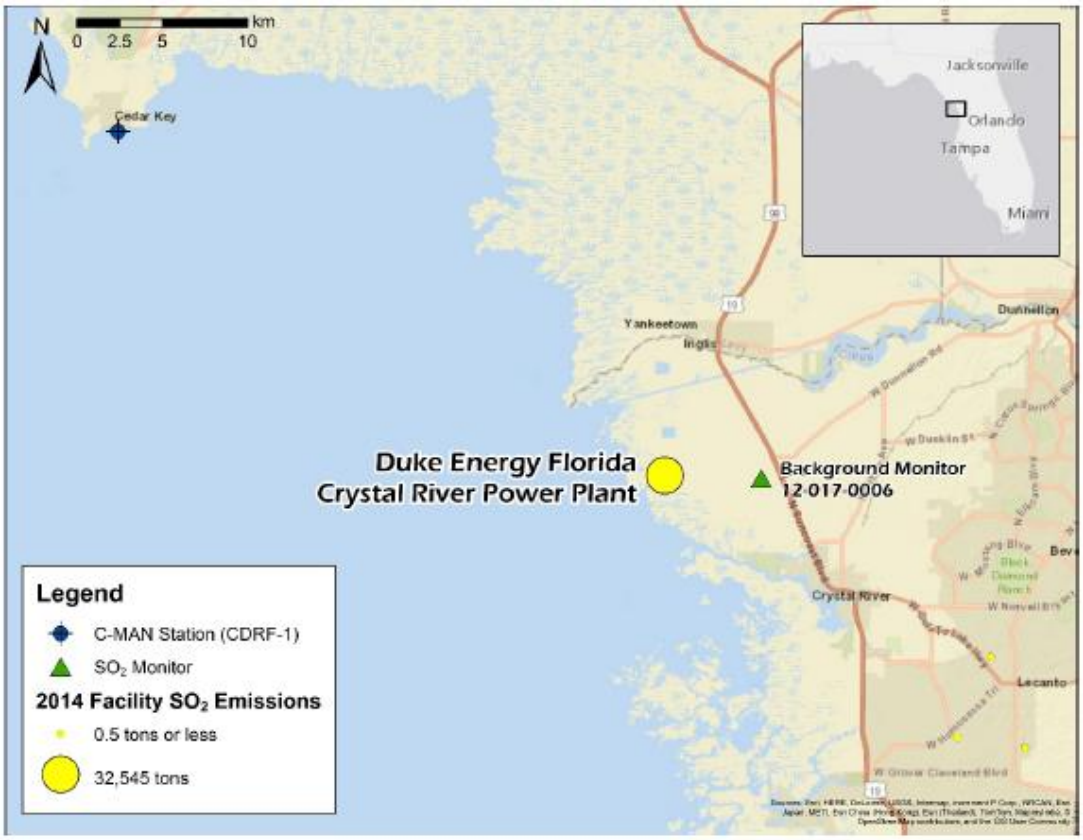
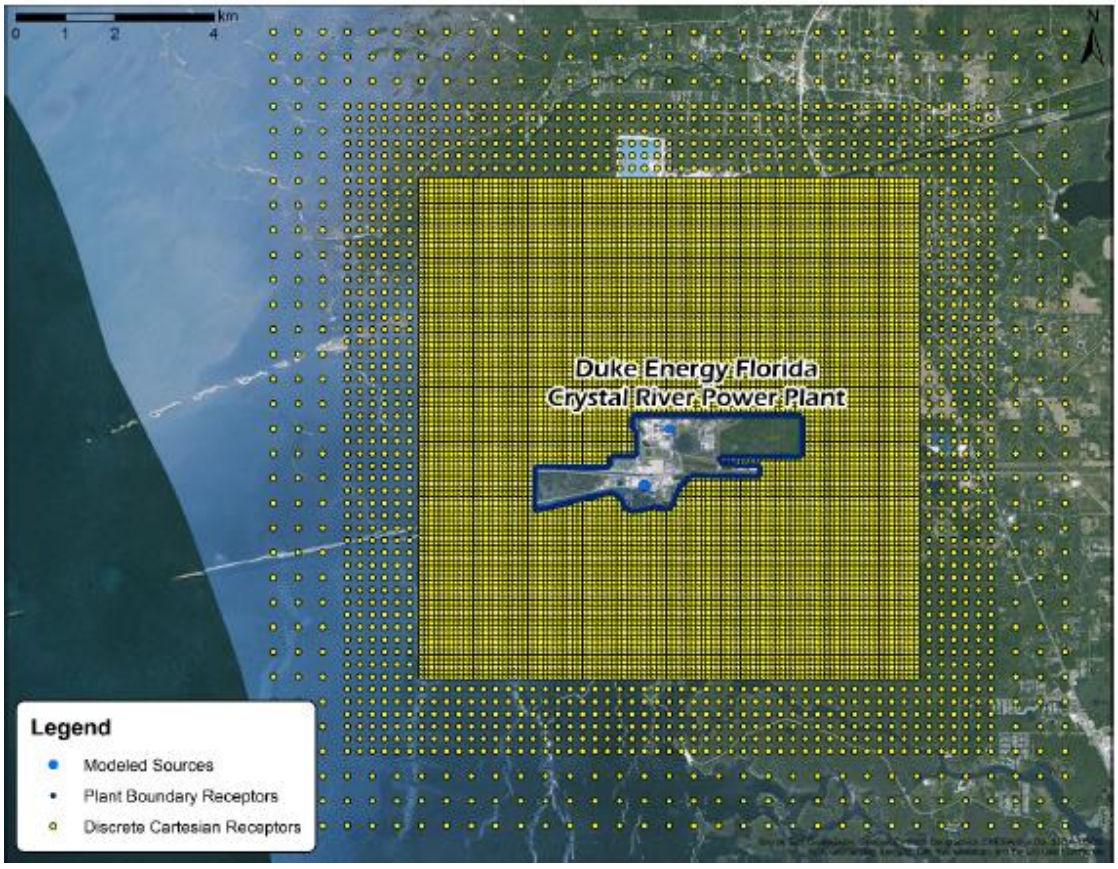


Figure 27. Receptor Grid for the Citrus County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



4.3.2.4.Modeling Parameter: Source Characterization

The State characterized this source 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 BPIPPRM was used to assist in addressing building downwash. The EPA agrees with Florida DEP's building downwash methodology associations for CRPP's sources and agrees with their source characterization for the area.

4.3.2.5. Modeling Parameter: Emissions

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).

As previously noted, the State included only CRPP as a modeled source within the 35 km area of analysis.

For CRPP, the State provided annual actual SO_2 emissions between 2012 and 2014. This information is summarized in Table 32. A description of how the State obtained hourly emission rates is given below this table.

Table 32. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Citrus County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
CRPP	15,822	16,520	19,324
Total Emissions from Facilities in the Area of Analysis	15,822	16,520	19,324

For CRPP, the actual hourly emissions data were obtained from CEMS for Units 4 and 5. However, for Units 1 and 2, the State asserts that sufficient data is not available to characterize the current emissions regime for Units 1 and 2 using actual hourly data. In order to resolve this matter, the State developed an emissions estimate for modeling purposes. Florida closely analyzed emissions data for Units 1 and 2 from the periods of 2012-2014 and 2016 and determined that the average SO_2 emission rate for Unit 1 decreased from 1.487 lb/MMBtu to 0.766 lb/MMBtu and Unit 2 decreased from 1.528 lb/MMBtu to 0.713 lb/MMBtu, when the fuel switched to lower sulfur coal was finalized in February 2016. The State omitted 2015 data from the averaging, claiming these data included long periods during which low-sulfur coal was burned for testing purposes. These average rates of decrease – 48.5 percent for Unit 1 and 53.3 percent for Unit 2 – were then applied to the emission rates for all hours operated over the period of 2012-2014 to create a file of simulated-actual, low-sulfur coal emissions.

The EPA considered Florida's use of adjusted 2012-2014 actual hourly emissions for coal-fired boiler units 1 & 2 to account for current operational changes. Florida reduced emissions for each hour in the 2012-2014 period by the average reduction resulting from the fuel switch to burning low-sulfur coal. The EPA communicated to Florida that the use of "simulated actual emissions" was not consistent with a technical analysis to demonstration that the area is attaining the NAAQS. We suggested that the modeling be revised to either use three years of non-modified actual emissions or current allowable limits for Units 1 & 2. No additional modeling has been received from Florida to address these issues.

4.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

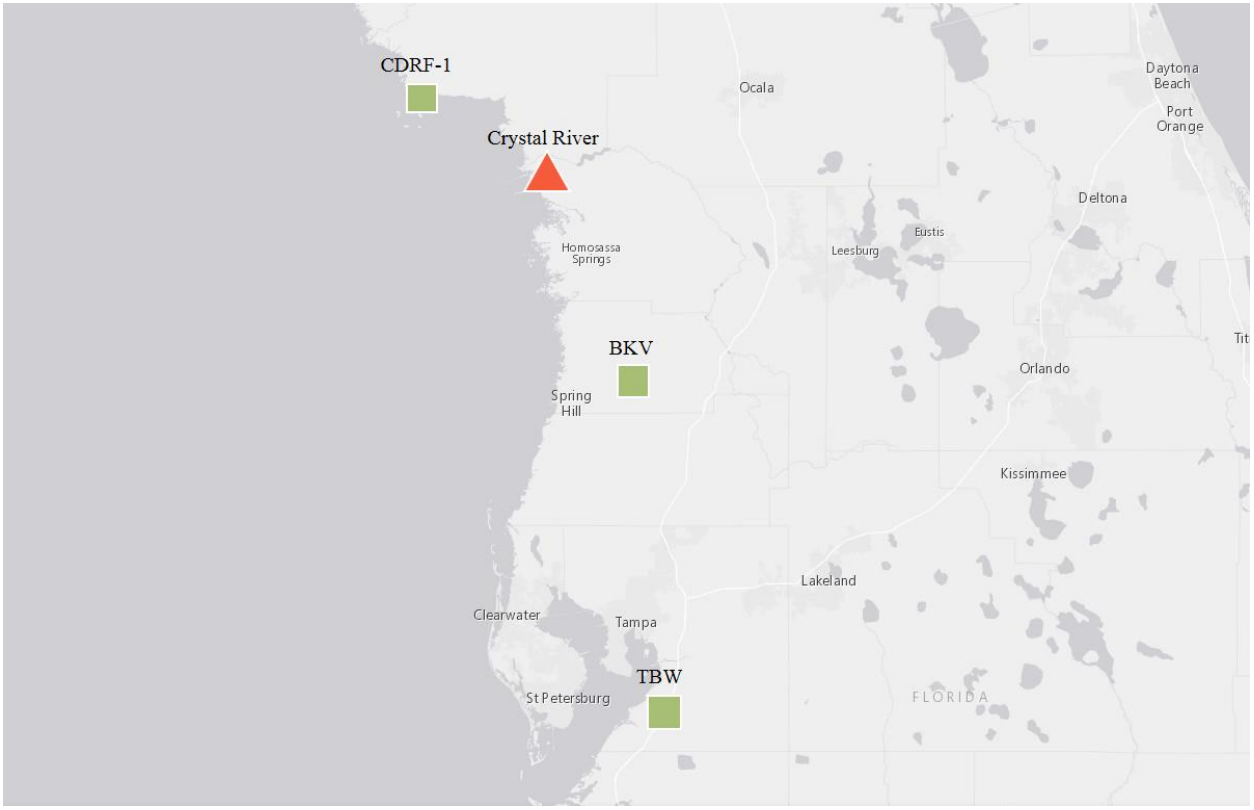
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 was 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 Citrus County, Florida, area, the State selected the surface meteorology from Cedar Key Coastal-Marine Automated Network (C-MAN) station (CDRF-1), operated by the National Data Buoy Center (NDBC). This land based station is located approximately 38 km northwest of CRPP in a similar coastal environment. CDRF-1 is a limited station that records only temperature, dew point, atmospheric pressure, and wind speed and direction. The Hernando County Airport (BKV) which is nearly 60 km southeast CRPP was an additional NWS data set used with ONSITE and SURFACE keywords to fill in missing data for CDRF-1. The coincident upper air observations from Ruskin, Florida, (TBW) at best represents meteorological conditions within the area of analysis.

The State used AERSURFACE version 13016 using data from CDRF-1 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. The surface roughness is sometimes referred to as “zo.” The state estimated surface roughness values for 12 spatial sectors out to 1 km at a seasonal temporal resolution for wet and average conditions.

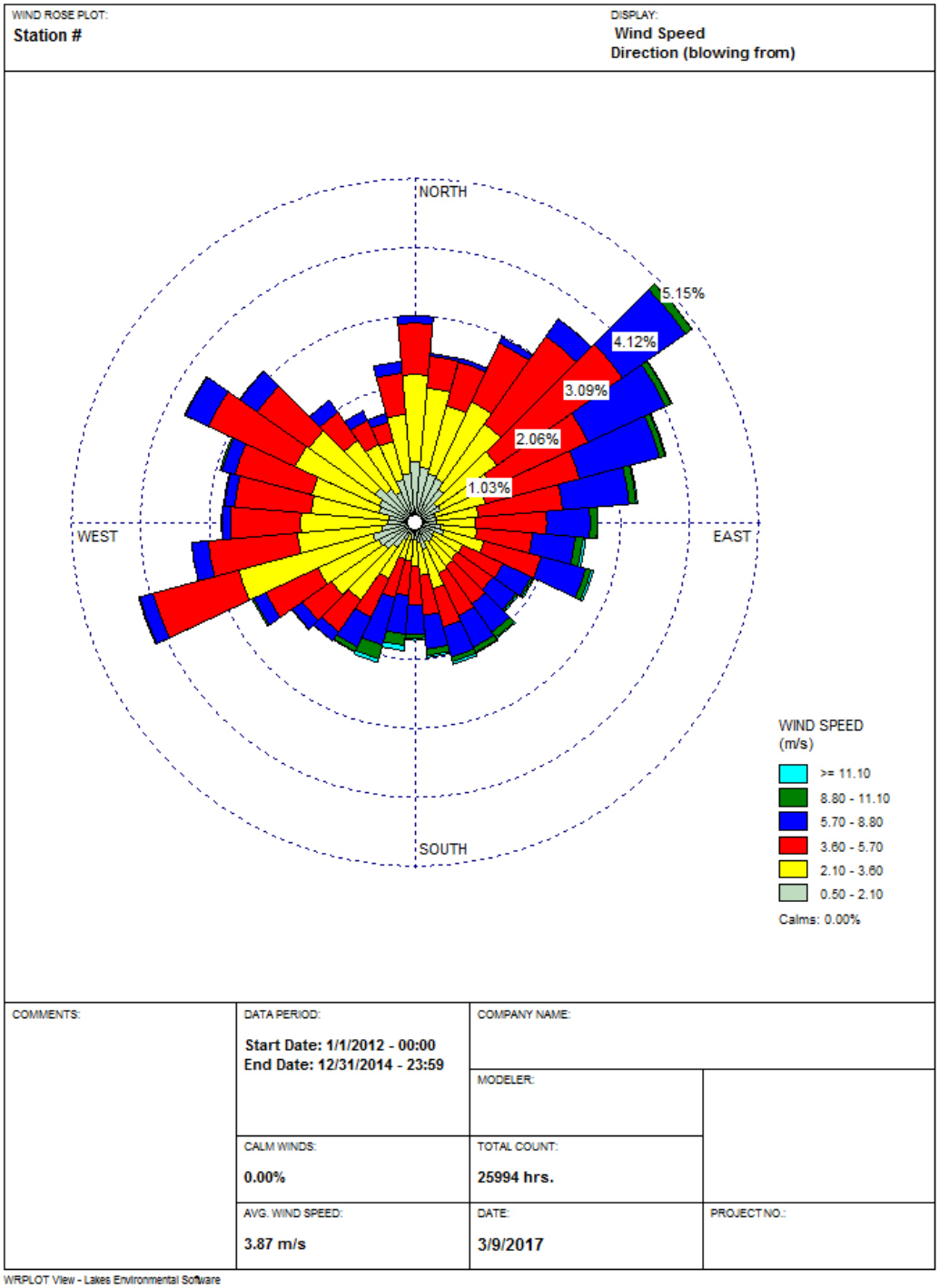
In the EPA generated figure below, the location of the NWS station CDRF-1 is shown relative to the area of analysis.

Figure 28. Area of Analysis and the NWS station in the Citrus County, Florida Area



The EPA generated a wind rose for the Cedar Key Coastal-Marine Automated Network (C-MAN) station (CDRF-1) for the 2012-14 period. In Figure 29, the frequency and magnitude of wind speed and direction are defined from where the wind is blowing. Analysis of the NWS data indicate winds predominately blow from the northeast, north, northwest, and west directions.

Figure 29. CDRF-1 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 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 Cedar Key Coastal-Marine Automated Network (C-MAN) station (CDRF-1) operated by the NDBC supplemental with along with the BKV dataset as NWS data using the ONSITE and SURFACE keywords. 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Cedar Key Coastal-Marine Automated Network (C-MAN) station located approximately 38 km northwest of CRPP in a similar coastal environment, with coincident upper air observations from Ruskin, Florida, (TBW) as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Crystal River Power Plant can be expected to the southwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Winter Have Municipal Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

The EPA concurs with Florida choice and processing method for their upper and surface meteorological data sets. These datasets address modeling protocol comments about meteorological representativeness that the EPA previously made during Fall of 2016. The EPA verified that the wind roses were used appropriately to explain what surface meteorology should be used justify representativeness around CRPP.

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

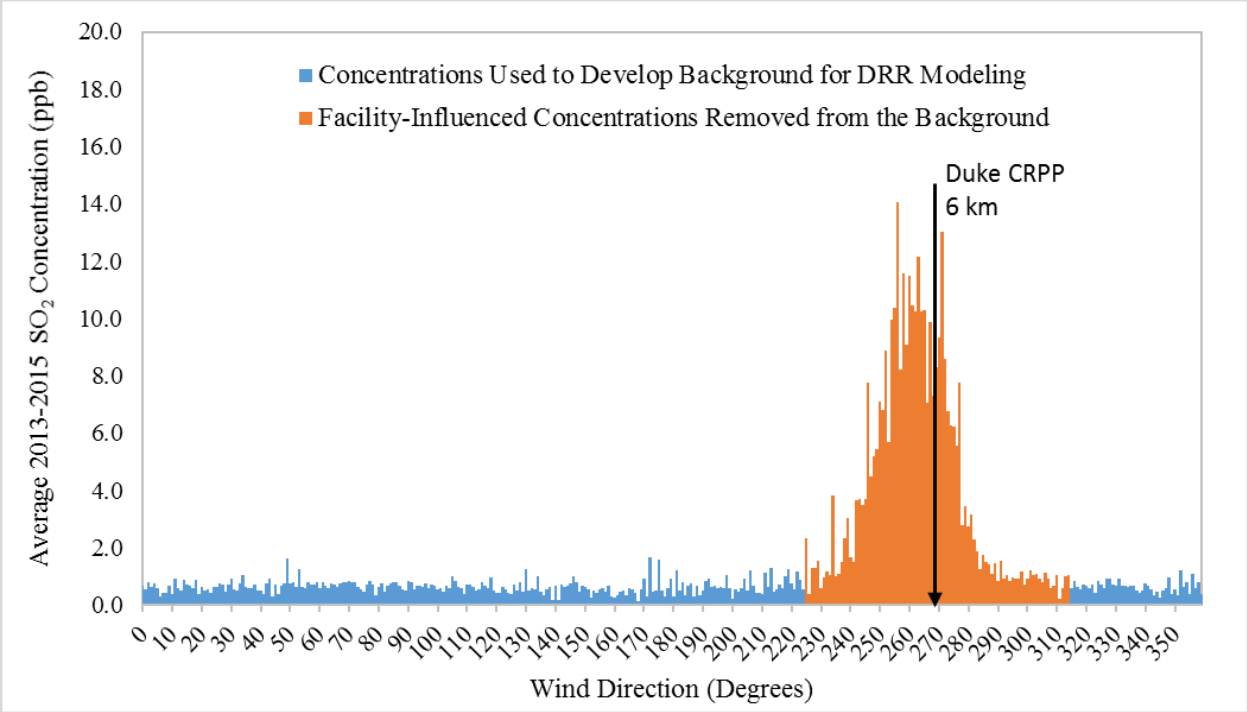
The terrain in the area of analysis is best described as flat. Florida ran AERMAP terrain program within AERMOD was used to specify terrain elevations for all the receptors.

While Citrus County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure all terrain changes were accounted for. The EPA agrees that this approach is acceptable.

4.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 99^{th} percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State chose to use a tier 2 approach. Data were obtained from 2013-2015 time period from the Crystal River Preserve monitor (AQS Site: AQS site ID # 12-017-0006), approximately 5.5 km east of CRPP facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Appendix W recommends filtering the data to remove measurements when the wind direction could transport pollutants from CRPP. In this case, any measurement recorded when the wind direction was from 225° to 314° was removed from the background calculation as shown in Figure 30.

Figure 30. 2013-2015 average SO_2 concentrations by wind direction for monitor 12-017-0006. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input into AERMOD with the BACKGRND SEASHR keyword (see below). The data used were obtained from the Florida Air Monitoring and Assessment System (FAMAS) for monitoring station No. 12-017-0006 for the period December 2013 to December 2015. The EPA guidance recommends using three years of concurrent monitoring data to develop the background concentrations but that was not possible in this case as the monitor did not begin operation until December 2013 and is the only monitor in the area. Table 33 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 33. Tier 2 Temporally Varying Background Concentrations from the Crystal River Preserve monitor (AQS Site: AQS site ID # 12-017-0006.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.00	1.50	1.50	2.00	12:00	1.67	1.50	10.50	2.50
1:00	0.67	1.50	1.50	2.00	13:00	1.33	1.50	10.00	2.50
2:00	0.67	1.50	1.50	2.00	14:00	1.00	2.00	1.50	3.50
3:00	0.67	1.50	1.50	2.00	15:00	1.67	2.00	7.50	2.00
4:00	0.67	1.50	1.50	2.00	16:00	1.00	1.50	1.50	2.00
5:00	0.67	1.50	1.50	2.00	17:00	0.67	1.50	1.50	2.00
6:00	1.00	2.00	1.50	2.50	18:00	0.67	1.00	4.00	2.00
7:00	0.67	1.50	1.50	2.00	19:00	0.67	1.50	2.50	2.50
8:00	0.67	2.50	2.00	2.00	20:00	1.00	7.00	2.00	3.50
9:00	1.00	2.50	7.50	2.50	21:00	0.67	3.50	1.50	2.50
10:00	2.00	5.50	4.50	3.50	22:00	1.33	2.50	3.50	3.00
11:00	2.00	2.00	3.00	3.00	23:00	1.33	1.50	1.50	2.00

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2013-2015 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

4.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Citrus County, Florida area of analysis are summarized below in Table 34.

Table 34. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Citrus County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	4
Modeled Structures	20
Modeled Fencelines	1
Total receptors	11,460
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Cedar Key Coastal-Marine(CDRF-1) Hernando County Airport (BKV)
NWS Station Upper Air Meteorology	Ruskin, Florida (TBW)
NWS Station for Calculating Surface Characteristics	Cedar Key Coastal-Marine(CDRF-1)
Methodology for Calculating Background SO_2 Concentration	12-017-0006, 2013-2015 Season by Hour option in AERMOD
Calculated Background SO_2 Concentration	Temporally Varying

The results presented below in Table 35 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

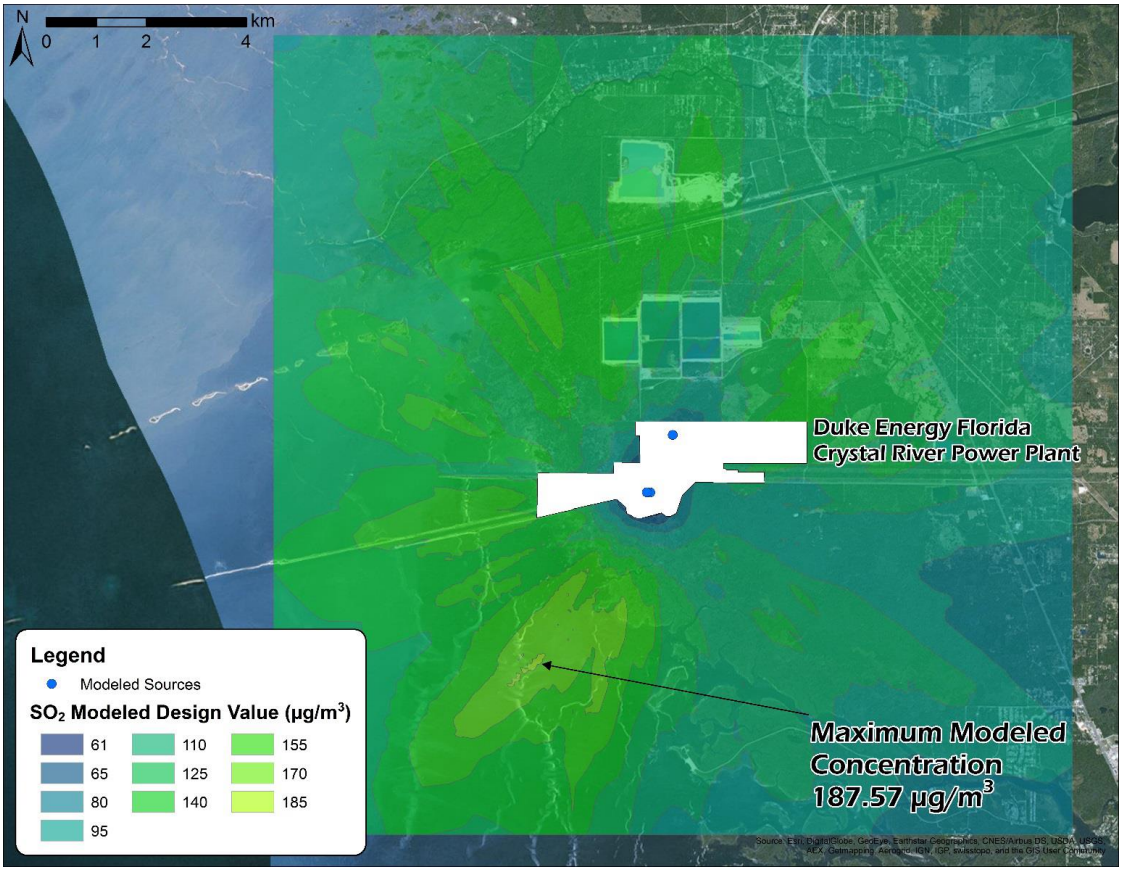
Table 35. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Citrus County, Florida Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	332080.00	3201067.00	187.57	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 187.57 µg/m^3, equivalent to 72 ppb. This modeled concentration included the background concentration of SO_2, but is based on the State's simulated expected future actual emissions from the facility. Figure 31 below was included as part of the State's recommendation, and indicates that the predicted value occurred southwest of CRPP. The extent of the State's receptor grid is also shown in the figure.

Figure 31. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Citrus County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is expected by the State to be violated in the future at the receptor with the highest modeled concentration. Additionally, based on the available information for the remaining areas in Florida, including monitoring and modeling, there are no current SO_2 nonattainment areas near Citrus County, Florida, and no expected nonattainment areas for this third round of designations near Citrus County, Florida. Therefore, the Citrus County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

4.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

With the exception of the hourly varying emissions used for CRPP, the EPA agrees with the modeling methodology used by Florida to characterize the area surrounding the facility. Given the criteria for selecting nearby sources, we believe that the decision to include only CRPP facility, and excluding all other sources from the modeling analysis was correct. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2013-2015 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment.

The EPA considered Florida's use of adjusted 2012-2014 actual hour emissions for coal-fired boiler CRPP's Units 1 & 2 to account for current operational changes. Florida reduced each hour of emissions in the 2012-2014 period by the average reduction resulting from the fuel switch to burning low-sulfur coal that occurred in 2015. The EPA communicated to Florida that its use of "simulated actual emissions" is not consistent with the technical demonstration necessary to show that this area is attaining the NAAQS. The EPA also suggested that the modeling be revised to either use three years of non-modified actual emissions or current allowable limits for Units 1 & 2. No additional modeling has been received from Florida to date, to address these issues.

The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. However, based upon the EPA's assessment and questions with the emissions used to model the emissions from CRPP, the EPA is unable to confirm that there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near CRPP.

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

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Citrus County. This factor, however, did play a significant role in the EPA's analysis. Since Florida recommended a designation of "attainment" or "unclassifiable" for Citrus County, the EPA determined that a boundary based on jurisdictions such as census block groups is appropriate for the area surrounding the source and monitor. Additionally, the EPA could not rely on modeling provided by Florida to inform the nonattainment boundary that used simulated actual emissions as that modeling submitted by the State did not show any areas of violation.

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

In its submission, Florida noted that the largest sources of SO_2 at CRPP, Units 1 and 2, have recently begun burning low-sulfur coal resulting in significant SO_2 emissions reductions. The switch from coal with an average sulfur content of 1.02 percent to coal with an average sulfur content of 0.41 percent in February 2016 has resulted in an SO_2 emission rate reduction of more than 50 percent. Florida stated that the recent significant change in emissions from Units 1 and 2 means that the actual emissions data from 2012-2014 are no longer representative of the ambient concentrations in the area around CRPP and should not be used to characterize the area. Both units have an electrostatic precipitator for controlling particulate matter emissions. The facility will continue to use the low-sulfur coal in Units 1 and 2 for the remainder of their lifespan (through 2018) for compliance with the EPA's MATS rule.

The State developed an emissions estimate for modeling purposes since the State believes that sufficient data was not available to characterize the current emissions regime for Units 1 and 2 using actual hourly data. The average rates of emissions decrease for each Unit were applied to the emission rates for all hours operated over the period of 2012-2014 to create a file of simulated-actual, low-sulfur coal. Florida then input this data file into AERMOD with all other parameters remaining unchanged. Additionally, the State made no adjustment to reflect the reduced dispatch schedule of these units, which they claim enhances the conservatism of the model.

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

Data collected by the Crystal River Preserve SO_2 monitor (AQS ID: 12-017-0006) in Citrus County is comparable to the 2010 SO_2 NAAQS, and indicates that the most recent SO_2 levels are violating the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data from this monitor (2014-2016) indicate a violating 1-hr SO_2 design value of 81 ppb. The monitor is located 3.4 miles east of CRPP. While the monitor has not been demonstrated to be located to characterize the maximum 1-hr SO_2 concentrations near CRPP or the area, it nevertheless shows violations of the 2010 SO_2 NAAQS.

Florida also provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area, however that modeling improperly utilized simulated actual emissions

that are neither representative of actual emissions nor federally enforceable and effective allowable emissions, or of corresponding estimated SO_2 air quality impacts. Therefore, the modeling is not reliable for designations purposes.

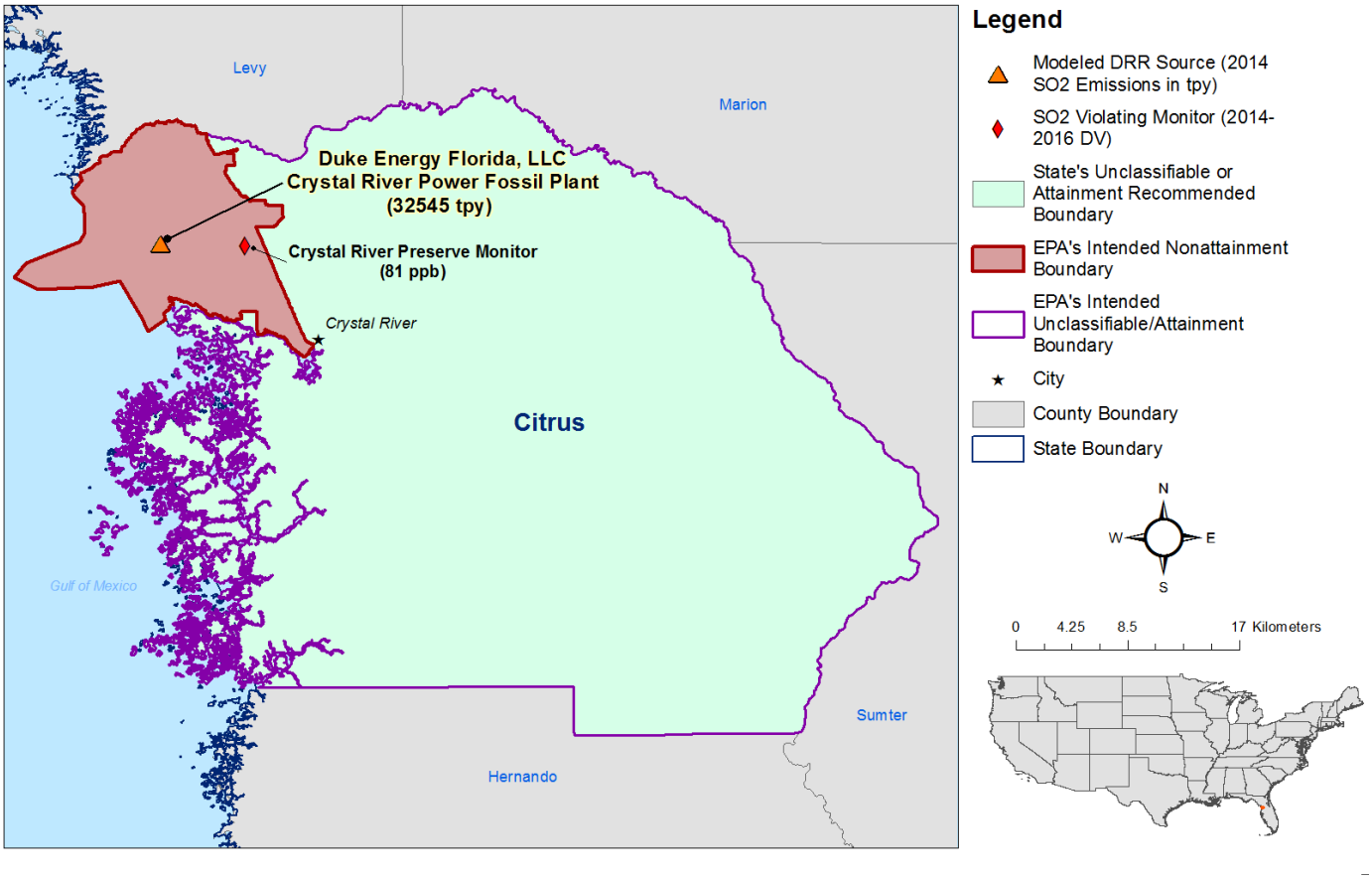
After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA has reached the conclusion that the area is violating the 2010 SO_2 NAAQS based on the available reliable monitoring data. Further, the EPA finds it appropriate to consider, in addition to the air quality monitoring data, sources of emissions and jurisdictional boundaries to inform a boundary for the nonattainment area.

The EPA believes that our intended nonattainment area, including census block groups that contain CRPP, the violating monitor, and the area in between the two, will have a clearly defined legal boundary, and we intend to find this boundary to be a suitable basis for defining our intended nonattainment area.

4.8. Summary of Our Intended Designation for the Citrus 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 a portion of Citrus County as nonattainment for the 2010 SO_2 NAAQS at this time, with the remainder of Citrus County being designated as unclassifiable/attainment. Specifically, the boundary is comprised of census block groups 4504004 and 4505002. Although the State recommended that the area surrounding CRPP be designated "attainment" or "unclassifiable," the EPA's intended partial county nonattainment boundary is consistent with the approach used in prior designations for areas without modeling suitable to inform the boundary. Figure 32 shows the boundary of this intended designated area.

Figure 32. Boundary of the Intended Citrus County Nonattainment Area



If, prior to the effective date of designations, the Citrus County SO_2 monitor produces a valid attaining design value for the 2015 – 2017 period and no other information indicates there is a NAAQS violation for the 2015 - 2017 period attributable to CRPP, then the EPA will change the designation of the area to unclassifiable. This is contingent on Florida early-certifying their data in advance of the effective date in early 2018 instead of the standard May 1, 2018 deadline. The unclassifiable designation would be consistent with designations for other areas around sources for which the EPA has no modeled violation. The designated area (to be determined) would be based on clearly defined, legal, jurisdictional boundaries that encompasses CRPP.

Alternatively, if, prior to the effective date of designations, the Citrus County SO_2 monitor produces a valid attaining design value for the 2015 – 2017 period, and credible modeling is provided for CRPP that indicates attainment for the current 3-year period, then the EPA will change the designation of the area to unclassifiable/attainment. The designated area would be Citrus County in its entirety.

Florida has recommended a designation of attainment or unclassifiable for the Citrus County area. EPA regulations for implementing the SO_2 NAAQS require Florida to characterize SO_2 air quality in each listed area. In considering Florida's recommendation, we have taken into account all available information, including any current (2014-2016) air monitoring data, and any air dispersion modeling analyses provided by Florida or a third party. The air monitoring data show a portion of Citrus County may be violating the 2010 primary SO_2 NAAQS, which would require a modification of the recommended designation. We invite Florida to review the available information and further discuss this issue with the EPA in order to inform an appropriate final designation.

5. Technical Analysis for the Duval County Area

5.1. Introduction

The EPA must designate the Duval County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Duval County.

5.2. Air Quality Monitoring Data for the Duval County Area

This factor considers the SO_2 air quality monitoring data in the area of Jackson County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

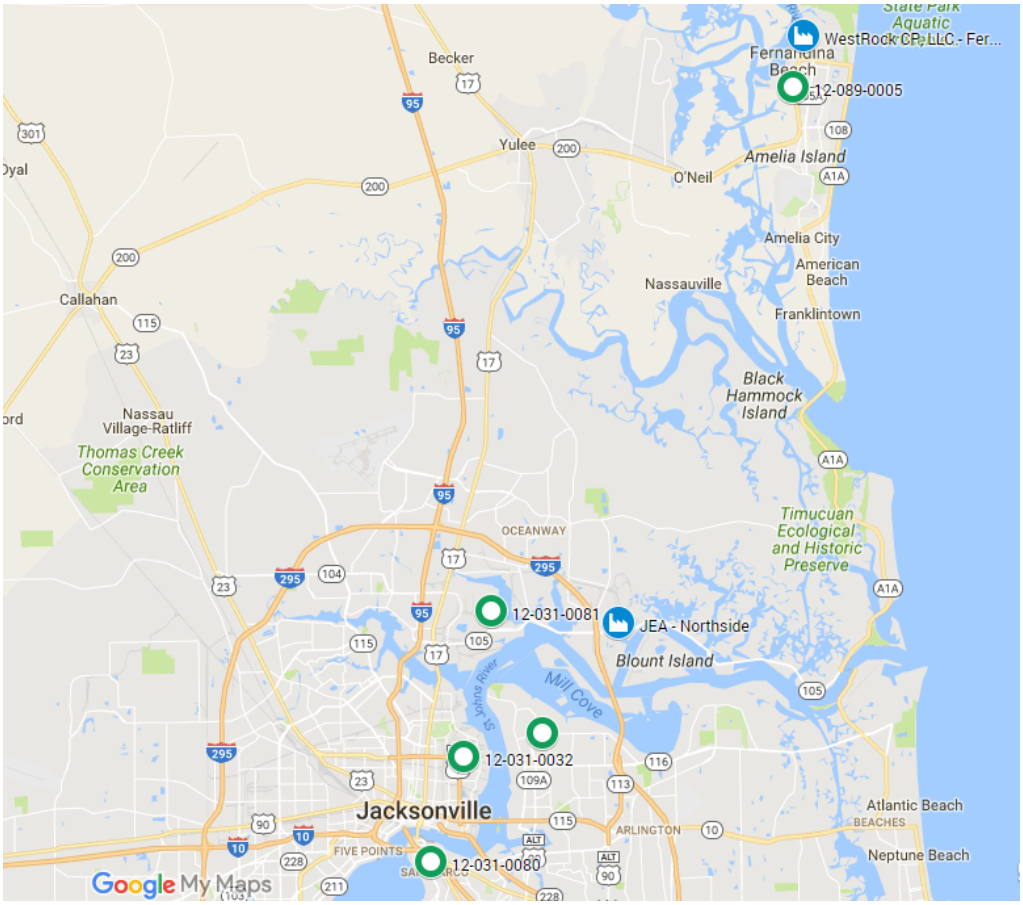
The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data summarized in the table below:

Table 36. SO_2 Monitoring Data in or Near Duval County

County	AQS Monitor ID	Monitor Location	2014-2016 SO_2 Design Value (ppb)
Duval	12-031-0032	30.35634, -81.6354	16
Duval	12-031-0080	30.30912, -81.6523	17
Duval	12-031-0081	30.42245, -81.621	20
Duval	12-031-0097	30.36746, -81.594	18
Nassau	12-089-0005	30.65855, -81.4632	51

The locations of the monitoring sites, relative to JEA Northside, are shown in the map below:

Figure 33. Duval County, Florida DRR Sources and Nearby Monitors



The Cedar Bay SO_2 monitor (AQS ID: 12-031-0081), the closest monitor to the source, is located 4.1 miles west of Jacksonville Electric Authority (JEA) Northside Generating Station (NGS). Data collected by all monitors in the table above are comparable to the NAAQS, and all indicate that the most recent monitored SO_2 levels are below the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data[14] from these monitors (2014-2016) indicate a maximum 1-hr SO_2 design value of 35 ppb in Duval County. However, none of these monitors were located to characterize the maximum 1-hr SO_2 concentrations near JEA Northside or the area and cannot be used to designate the area for the 2010 1-hr SO_2 NAAQS. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Duval County that could inform the intended designation action. The most recent SO_2 design

[14] Florida has certified its 2016 monitoring data, including the data from Duval County. The EPA Region 4 conducted a Technical Systems Audit of the Jacksonville air monitoring program in June 2017, and identified potential data quality issues with the SO_2 monitoring data collected at the Duval county monitoring sites. As a result, the EPA has requested the State and local agency to revalidate the 2014-2016 data from these monitors to ensure that quality assurance and data validation procedures were followed correctly.

values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

5.3. Air Quality Modeling Analysis for the Duval County Area Addressing Jackson Electric Authority

5.3.1. Introduction

This section 5.3 presents all the available air quality modeling information for a portion of Duval County that includes JEA NGS and St. Johns Power Park. This portion of Duval County will often be referred to as "the Duval County area" within this section 5.3. This area contains the following SO_2 sources, principally the sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The JEA owns and operates the combined NGS and St. Johns River Power Park (SJRPP) facility in Jacksonville, Florida. The JEA NGS/SJRPP facility emitted 2,000 tons or more annually. Specifically, JEA NGS/SJRPP emitted 20,978.32 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

- The Cedar Bay/Generating Plant (733 tons in 2014), Renessenz Jacksonville Facility (642 tons in 2014), Anchor Glass Jacksonville Plant (123 tons in 2014), and IFF Chemical Holdings (986 tons in 2014) each do not emit 2,000 tons or more annually, but were included in the modeling assessment.

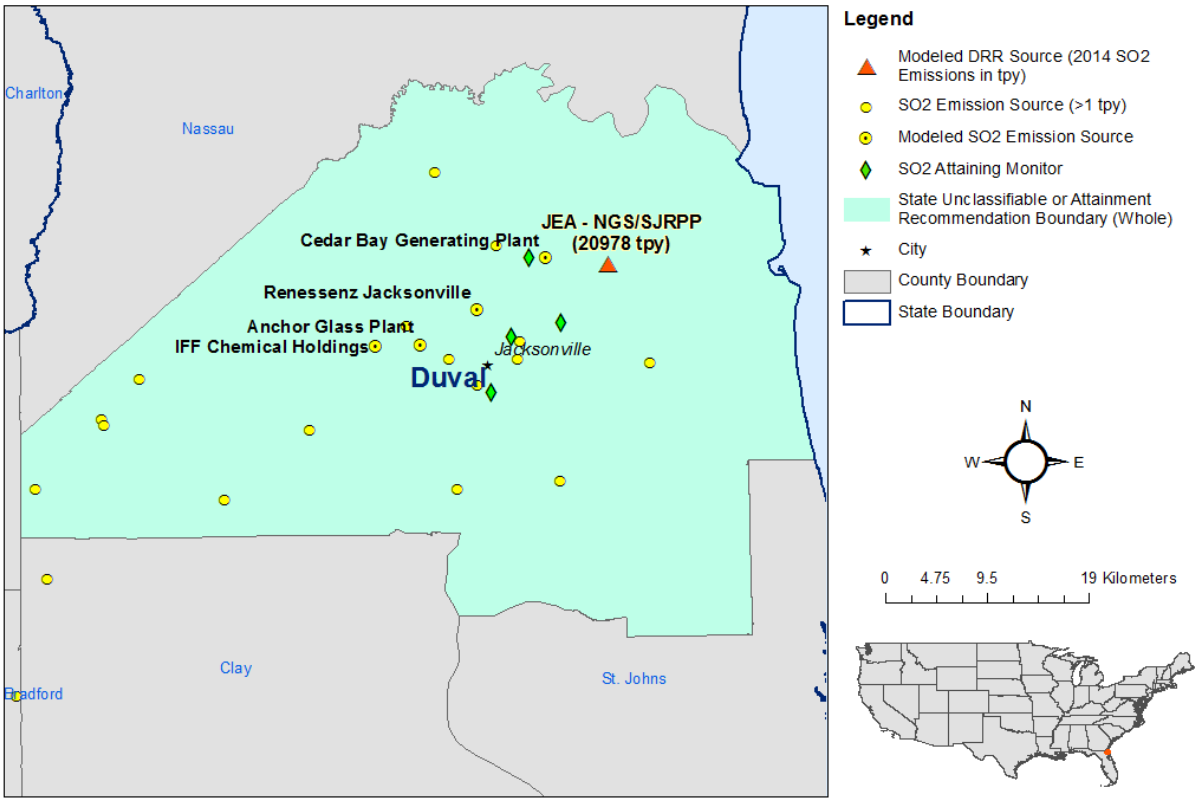
In its submission, Florida recommended that an area that includes the area surrounding the JEA NGS/SJRPP, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing a mixture of actual and allowable emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA intends to designate the area as unclassifiable/attainment. Our reasoning for this conclusion is explained in a later section, after all the available information is presented.

The area that the State has assessed via air quality modeling is located in the eastern coastal area of Duval County in the Jacksonville area.

As seen in Figure 34 below, the JEA NGS/SJRPP facility is located in Duval County. It is located north-east of the intersection of Routes 295 and 105 in Jacksonville, and is 8.5 miles from the Atlantic Ocean, on the north bank of a back channel of St. Johns River.

Also included in the figure are other nearby emitters of SO_2.[15]. These are Cedar Bay/Generating Plant, JEA Buckman, Renessenz Jacksonville Facility, Owens-Corning Jacksonville, Anchor Glass Jacksonville Plant, IFF Chemical Holdings, Duval Asphalt, Phillips Highway, Rayonier Performance Fibers, and WestRock Feranandina Beach. All sources are located in the Duval County area in the City of Jacksonville. Facilities are near the coastline of the Atlantic Ocean.

Figure 34. Map of the Duval County Area Addressing JEA NGS/SJRPP.



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 three different modeling assessments, including three assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received,

[15] All other SO_2 emitters of 2,000 tpy or more based on information provided by the State of Florida are shown in Figure 34. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 37. Modeling Assessments for the Duval County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida DEP	8/3/2017	Supplemental Modeling Report	Updated background concentration
Florida DEP	1/13/2017	Duval County Modeling Report	Report
Florida DEP	06/30/2016	Florida Modeling Protocol	Protocol

5.3.2. Modeling Analysis Provided by the State

5.3.2.1.Differences Between and Relevance of the Modeling Assessments Submitted by the State

The State submitted the DRR modeling protocol to the EPA staff in June 2016. After the review was conducted, the EPA staff identified no issues with the modeling protocol that was provided. The Duval County Modeling Report does not show any significant changes from the inputs, model versions, or assessments of the protocol. The conclusions provided in the protocol are similar to the modeling assessment in the report. The Duval County Modeling Report from the State is primarily used in this chapter, but other details from the protocol may be relevant.

5.3.2.2.Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203).

This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

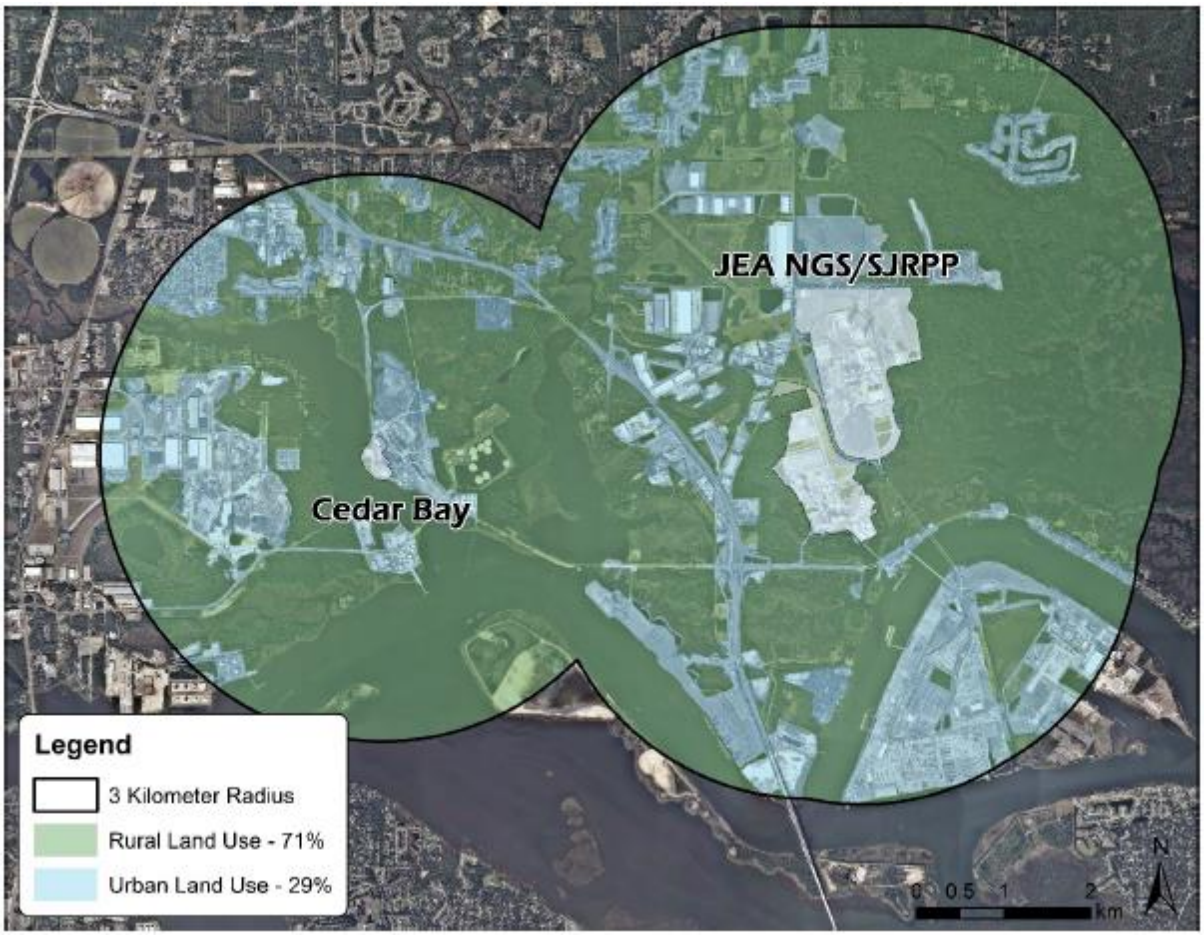
At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

5.3.2.3.Modeling Parameter: Rural or Urban Dispersion

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

AERMOD contains different dispersion coefficients for rural and urban settings. Appendix W outlines two methods for determining whether the area should be considered rural or urban. Florida chose to the land-use classification approach employing Auer's method. The method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. The land use in Duval county is mostly rural. Rural land use constitutes a majority (71 percent) of the combined 3-km radius around NGS/SJRPP and Cedar Bay. Figure 35 depicts the land use representation of the Auer method.

Figure 35. Land use for the JEA NGS/SJRPP Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA concurs with Florida's assessment of the land use for the Duval County facility and therefore agrees with the use of rural mode in AERMOD.

5.3.2.4. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The JEA NGS/SJRPP source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Duval County area, the State evaluated 9 other emitters of SO_2 within 35 km of JEA NGS/SJRPP in any direction for potential inclusion in the modeling analysis. Table 38 provided in Florida's Modeling Report identifies the other sources that were

considered for inclusion in the modeling analysis. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. All sources within 20 km of JEA NGS/SJRPP with 2014 emissions of at least 100 tpy were included in the modeling. The state evaluated all other sources within 35 km of JEA using the "20D[16]" technique. Based on this approach, Florida determined that four sources should be included in the modeling including: Cedar Bay, Renessenz, Anchor Glass, and IFF Chemical. The state asserted that WestRock was not chosen for inclusion in the analysis because it is a DRR-applicable source and will be included in the modeling for Nassau County. The EPA does not agree with the State's rationale for not including the Westrock facility in the modeling. However, based upon the distance from the Westrock facility to the JEA NGS/SJRPP facility (31 km), the EPA believes that emissions from the Westrock facility are unlikely to have a significant concentration gradient near JEA NGS/SJRPP. Therefore, any potential impacts from Westrock are accounted for using the representative background concentration.

Table 38. SO_2 Emissions Sources within 35 km of the JEA NGS/SJRPP Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from NGS/SJRPP (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
031-0045	JEA NGS/SJRPP Facility [a]	0	0	20,978.32	Yes
031-0337	Cedar Bay Generating Plant [a]	5	100	732.82	Yes
031-0166	JEA Buckman	11	220	37.05	No
031-0039	Renessenz Jacksonville Facility [a]	12	240	642.05	Yes
031-0050	Owens-Corning Jacksonville	12	240	45.91	No
031-0005	Anchor Glass Jacksonville Plant [a]	17	340	123.06	Yes
031-0071	IFF Chemical Holdings [a]	21	420	986.45	Yes
031-0043	Duval Asphalt Phillips Highway	21	420	8.81	No
089-0004	Rayonier Performance Fibers [b]	28	560	354.82	No
089-0003	WestRock Fernandina Beach [c]	31	620	3,477.17	Yes

a. Explicitly modeled facilities.
b. Rayonier is an explicitly modeled facility in the WestRock DRR report; **Appendix G** to this submittal.
c. WestRock is a DRR-applicable facility and is characterized in **Appendix G** to this submittal.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the JEA NGS/SJRPP facilities.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

[16] Using the 20D technique, if a facility being evaluated for potential inclusion in the modeling has emissions which exceed 20D (20 times the distance in km from JEA to the source under consideration) then the source is retained for potential inclusion in the modeling analysis. EPA's "Screening Threshold" Method for PSD Modeling Memo, 1985.

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

Based on this guidance from the Modeling TAD, the State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within NGS/SJRPP's fenceline were removed and receptors were placed with 50 m spacing along the fenceline. This grid placement was sufficient to fully resolve the maximum modeled concentrations in the Duval County modeling demonstration. Below in Table 39 that describes the states dense grid:

Table 39. Dense Receptor Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	SJRPP Boiler 1
Unit UTM Zone	17N
Unit UTM Easting (m)	447,087.08
Unit UTM Northing (m)	3,366,660.94
Actual Stack Height (m)	195.07
Expected Distance to Max Concentration (m)	1,951
20 Times Stack Height (m)	3,901
100 m Receptor Spacing - Extent from the Origin (m)	4,000
250 m Receptor Spacing - Extent from the Origin (m)	6,500
500 m Receptor Spacing - Extent from the Origin (m)	9,000
Plant Boundary Receptor Spacing (m)	50
Total Receptors	8,991

The receptor network contained 8,991 receptors, and the network covered the coastal northeastern portion of Duval County in Florida.

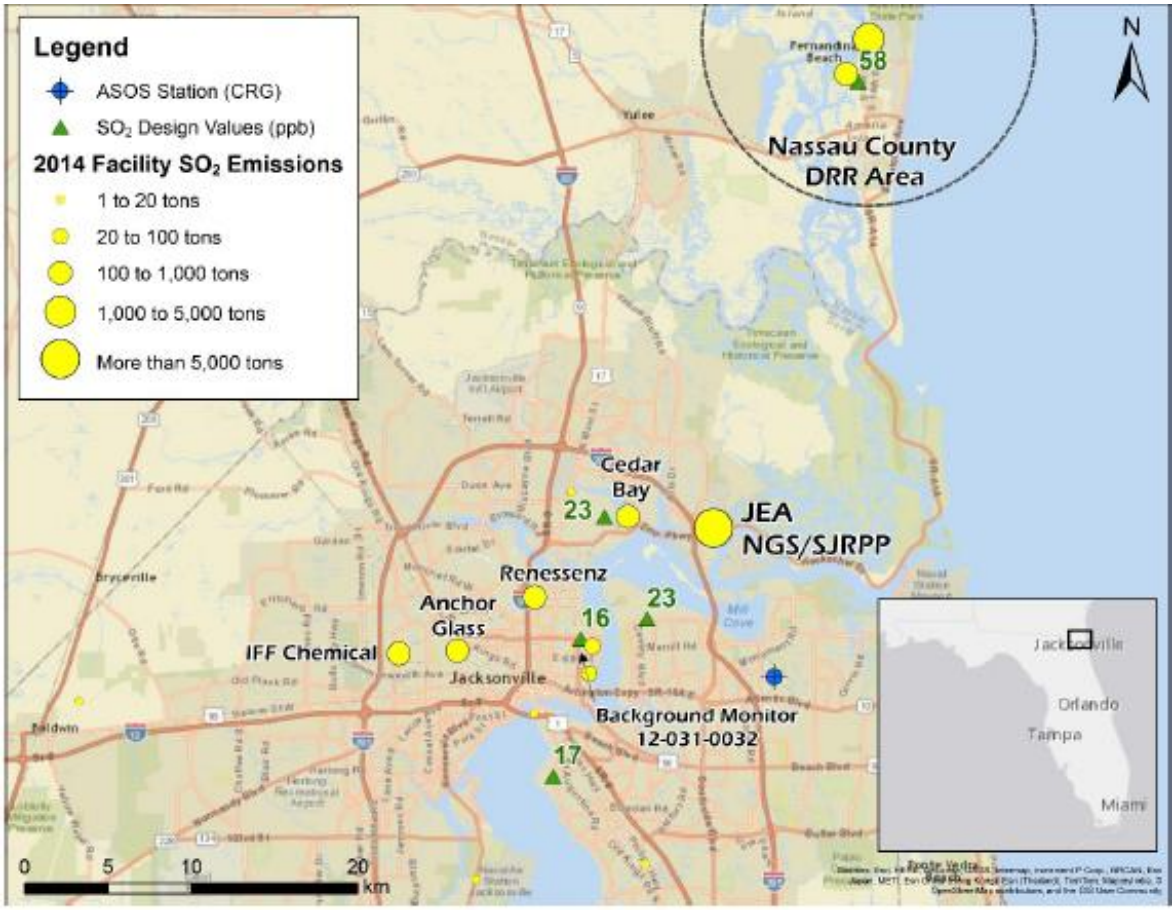
Figures 36 and 37, included in the State's recommendation, show the State's chosen area of analysis surrounding JEA NGS/SJRPP, as well as the receptor grid for the area of analysis.

Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The state chose not to employ this process and instead included receptors in all areas the State considered ambient air within 9 km of NGS/SJRPP. The state has placed receptors on a road between two facilities which is in ambient air. Figure 37 from the Florida Modeling Report shows the JEA NGS/SJRPP fence line boundary. However, no information was provided in Florida's Modeling Report for the Duval County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this

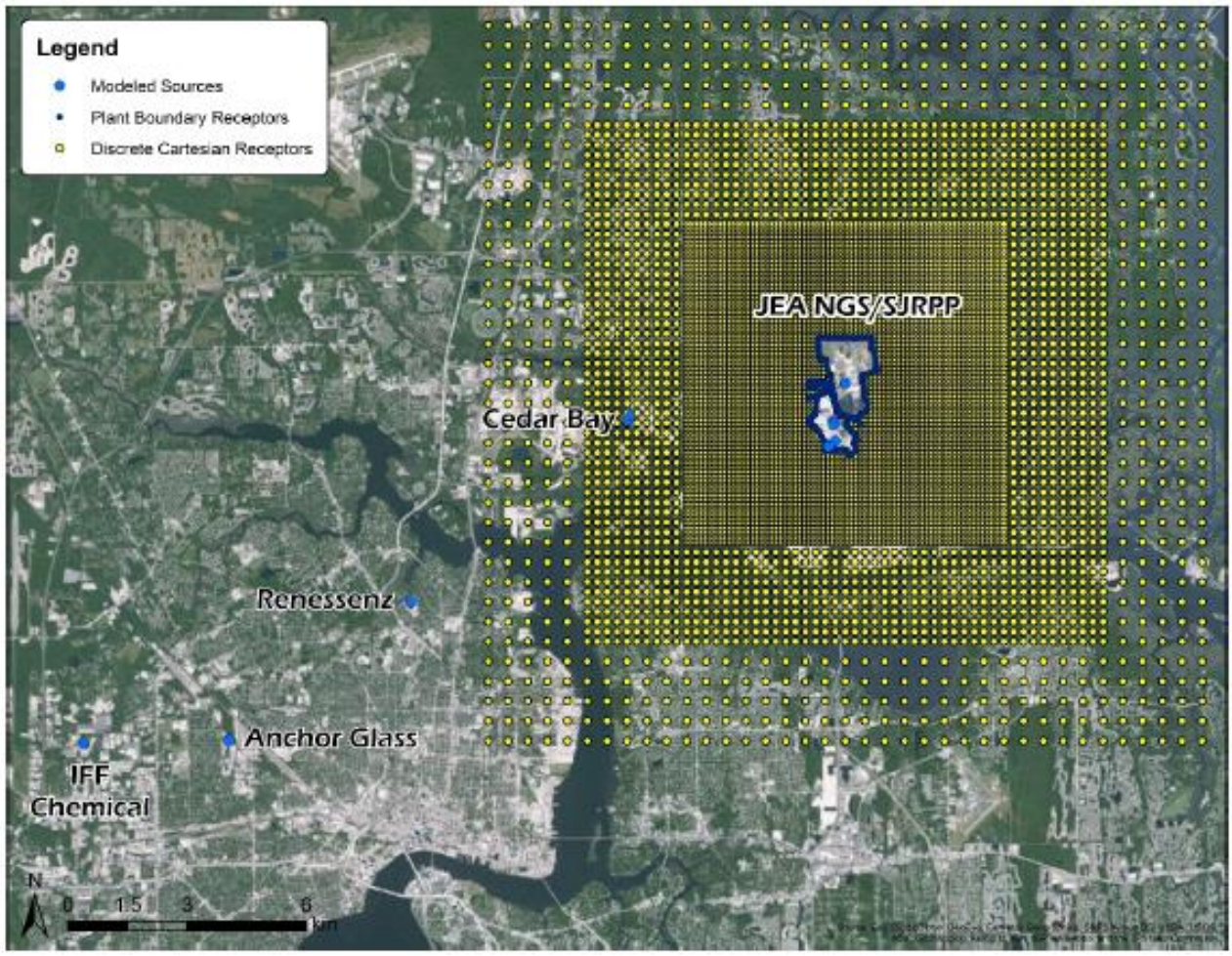
issue. Florida responded via email[17] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable. After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 36. Area of Analysis for the Duval County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[17] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 37. Receptor Grid for the Duval County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



5.3.2.5. Modeling Parameter: Source Characterization

Below is Table 40 that details the equipment used for the NGS/SJRPP facility with stack parameters and emission rates. SO_2 emissions from NGS/SJRPP are predominantly from four fossil fuel-fired electric generating boilers that operate mostly on coal. The two units at NGS are circulating fluidized bed (CFB) boilers that utilize limestone injection to the bed to eliminate most SO_2 emissions. The two units at SJRPP utilize flue-gas desulfurization (FGD) systems to scrub the plumes of SO_2 before the plumes leave the stacks. There are also four pre-NSPS simple-cycle combustion turbine (SCCT) peaker units at NGS that fire only fuel oil and have uncontrolled emissions. These units are rarely operated. Finally, there is also a pre-NSPS fossil fuel-fired electric generating boiler at NGS that fires mostly natural gas to control emissions. Given the low utilization of the peakers and the low sulfur content of natural gas, these five units typically constitute only about 1 percent of NGS/SJRPP's total SO_2 emissions. SO_2 emissions from all units are monitored by in-stack CEMS.

Table 40. Modeling Parameters for NGS/SJRPP Sources. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Unit Description	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Exit Temp (K)	SO_2 Emission Rate
SJRPP Boiler 1	195.07	6.79	CEMS	CEMS	CEMS
SJRPP Boiler 2	195.07	6.79	CEMS	CEMS	CEMS
NGS Boiler 1	150.88 [a]	4.57	CEMS	CEMS	CEMS
NGS Boiler 2	150.88 [a]	4.57	CEMS	CEMS	CEMS
NGS Boiler 3	91.44	4.72	46.54	397.70	CEMS
NGS SCCT 3	9.14	3.93	45.09	699.80	CEMS
NGS SCCT 4	9.14	3.93	45.09	699.80	CEMS
NGS SCCT 5	9.14	3.93	45.09	699.80	CEMS
NGS SCCT 6	9.14	3.93	45.09	699.80	CEMS

a. The calculated GEP stack height is 137.03 m.

The state characterized the NGS/SJRPP 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. Traditional allowable emissions modeling demonstrations require the use of the calculated GEP stack height for all sources in the model. The Modeling TAD also includes recommendations for modeling parameters that aim to replicate actual ambient concentrations of SO_2. As such, the use of actual stack heights is recommended if the source is characterized using actual hourly emissions data. The stacks for NGS Boilers 1 and 2 are the only stacks at NGS/SJRPP that exceed GEP height. 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 BPIPPRM was used to assist in addressing building downwash.

In addition to NGS/SJRPP, Florida determined that four sources should be included in the modeling: Cedar Bay, Renessenz, Anchor Glass, and IFF Chemical. The state chose to model the Renessenz facility with actual emissions and actual stack heights. The other three facilities were modeled using permitted allowable emissions. Florida appropriately followed the EPA's GEP policy in conjunction with allowable emissions limits.

The EPA agrees with Florida's method for characterizing the area. Florida's decision to model NGS/SJRPP and Renessenz using actual emissions, and Cedar Bay, Anchor Glass, and IFF Chemical with allowable emissions is acceptable. The use of actual stack heights for NGS/SJRPP and GEP stack height calculations for offsite sources is appropriate given the mixed use of actual and allowable emissions. Building downwash is also appropriately accounted for in the NGS/SJRPP modeling.

5.3.2.6. 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 JEA NGS/SJRPP and four other emitters of SO_2 within 35 km in the area of analysis. The State has chosen to model these facilities using a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The state has chosen to model the JEA NGS/SJRPP and Renessenz facilities using actual emissions. The Cedar Bay and IFF Chemical facilities were modeled at PTE. The facilities in the State's modeling analysis and their associated annual actual SO_2 emissions between 2012 and 2014 are summarized below.

For JEA NGS/SJRPP and Renessenz Jacksonville facilities, the State provided annual actual SO_2 emissions between 2012 and 2014. This information is summarized in Table 41. Additionally, Florida provided information to show that 2015 actual emissions of SO_2 at NGS/SJRPP were more than 70 percent less than in 2014. A description of how the State obtained hourly emission rates is given below this table.

Table 41. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Duval County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
JEA NGS/SJRPP	13,835	16,456	20,978
Renessenz Jacksonville Facility	193	419	646
Total Emissions from All Modeled Facilities in the State's Area of Analysis	14,028	16,875	21,624

For the JEA NGS/SJRPP facility, the actual hourly emissions data were obtained from CEMS for the period 2012-2014. For the Renessenz facility, the actual emissions were derived from hourly and daily fuel usage and monthly average vapor incineration.

The Cedar Bay, Anchor Glass, and IFF Chemical facilities were modeled at the PTE rates shown below. The hourly equivalent PTE values were converted to tpy by multiplying the permit limits by 8,760 hours per year.

Table 42. SO_2 Emissions based on PTE from Facilities in the Area of Analysis for the Duval County Area

Facility Name	SO_2 Emissions (tpy)
	PTE
Cedar Bay Generating Plant	5,046
Anchor Glass Jacksonville Plant	354
IFF Chemical Holdings	1,669
Total PTE Emissions from All Modeled Facilities in the State's Area of Analysis	7,069

For the permitted allowable emissions limits that have averaging times greater than a 1-hour average (e.g., 30-day average limits), Florida appropriately converted the limits to 1-hour average limits using the procedures contained in the EPA's April 23, 2014, "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions." The PTE in tons per year for each of these facilities provided in the table above was determined by the EPA by multiplying the maximum allowable hourly permitted emission rates (PTE) in pounds per hour for each unit by 8,760 hours in a year and dividing by 2000 pounds per ton. The facilities were modeled using maximum allowable emissions and corresponding stack parameters consistent with the GEP Policy. Emissions were assumed to be the same in each modeled year.

The EPA agrees with Florida's use of actual emissions for the JEA NGS/SJRPP and Renessenz Jacksonville facilities, and with the use of permit allowable (PTE) emissions for The Cedar Bay, Anchor Glass, and IFF Chemical facilities. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

5.3.2.7. Modeling Parameter: Meteorology and Surface Characteristics

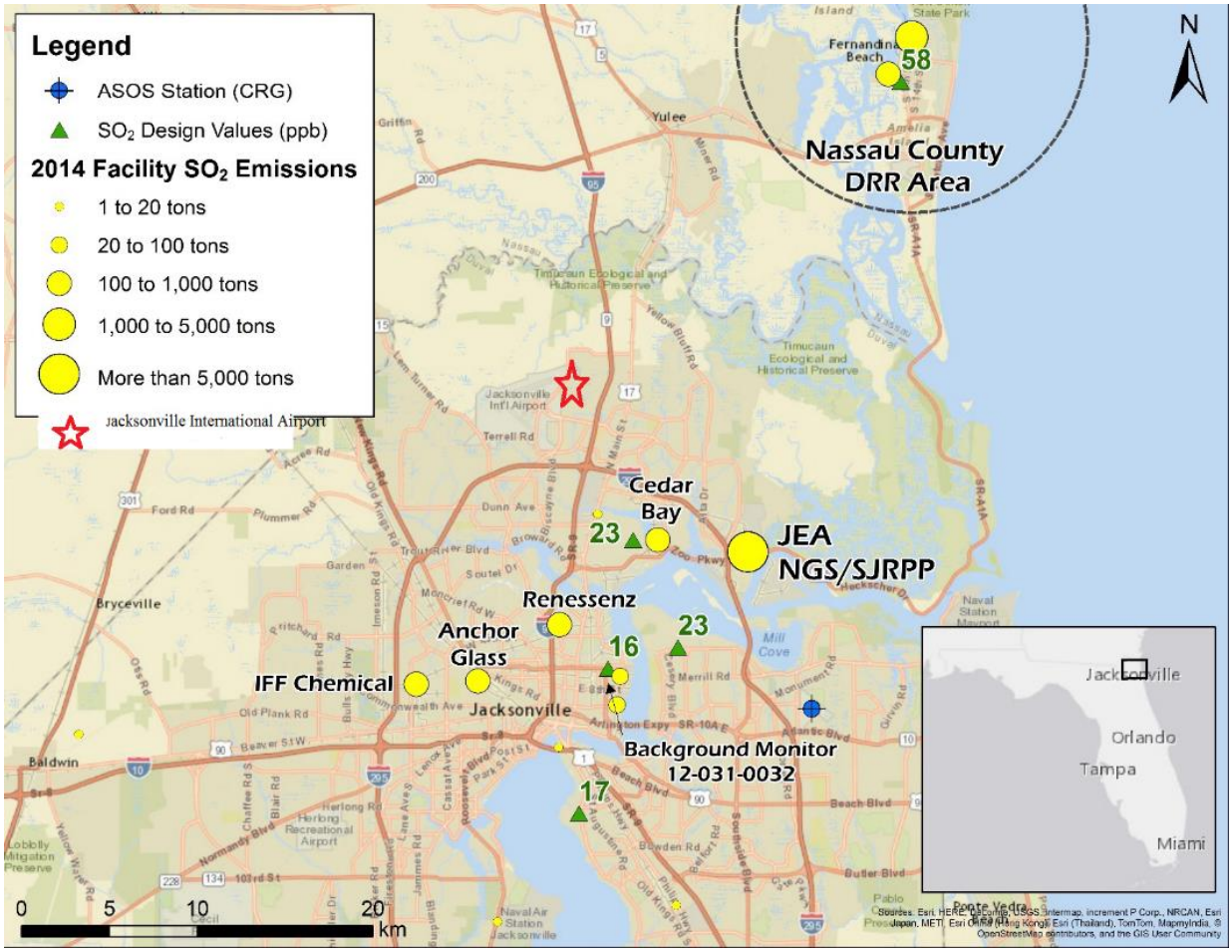
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Duval County, Florida, area, the State selected the surface meteorology from Jacksonville's Craig Municipal Airport, located approximately 10 km southeast of the JEA NGS/SJRPP facility, and coincident upper air observations from Jacksonville International Airport as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from Jacksonville's Craig Municipal 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

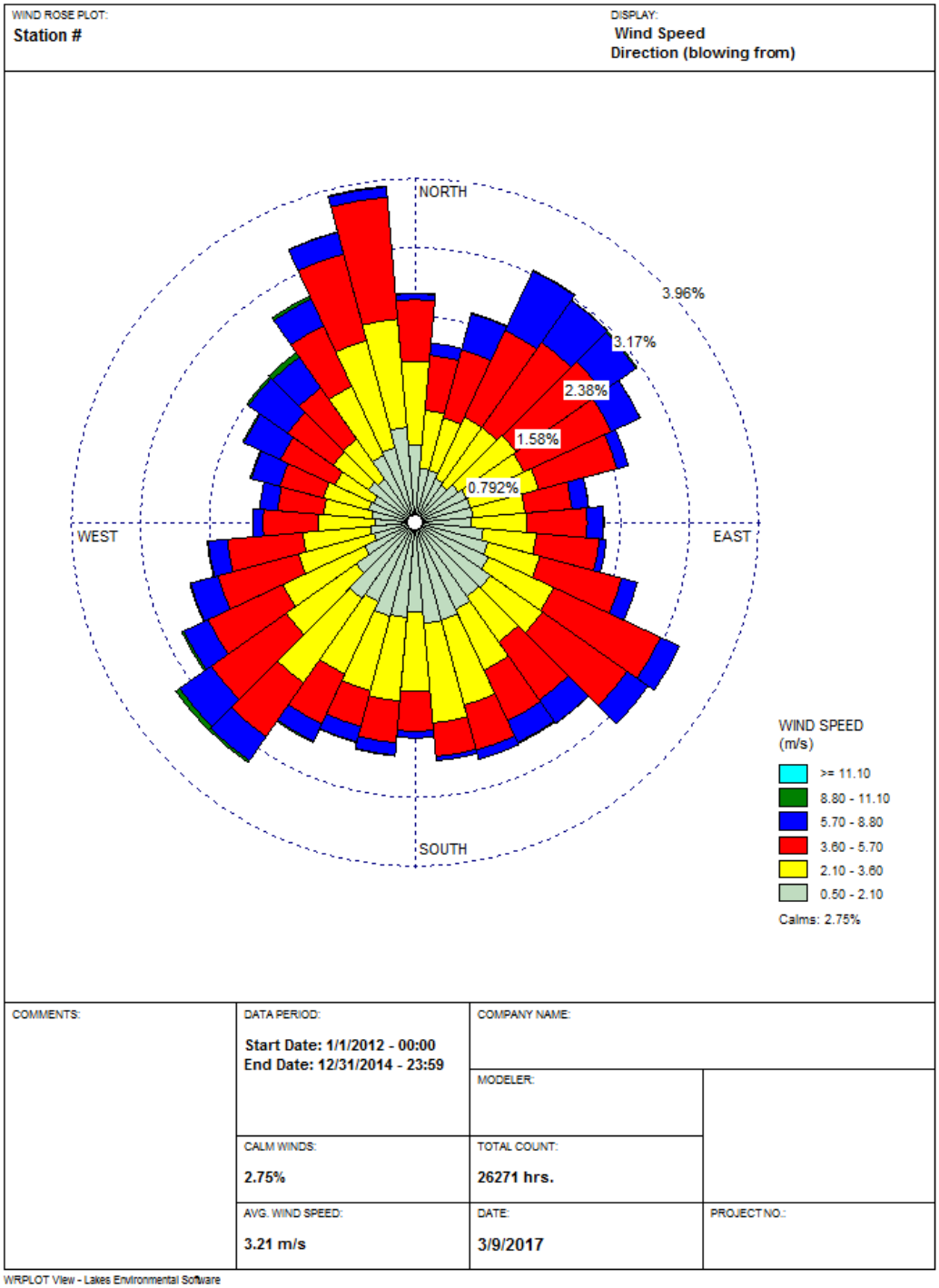
In the figure below, generated by the EPA and Florida, the location of these NWS stations are shown relative to the area of analysis.

Figure 38. Area of Analysis and the NWS stations in the Duval County, FL Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a wind rose for the Craig Municipal Airport for the 2012-14 period. In Figure 39, 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 predominantly blow from the north, northeast, southeast and southwest directions.

Figure 39. Craig Municipal Airport 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 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 Jacksonville's Craig Municipal Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Jacksonville's Craig Municipal Airport, located approximately 10 km southeast of the JEA NGS/SJRPP facility, and coincident upper air observations from Jacksonville International Airport as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from NGS/SJRPP can be expected to the northeast of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Jacksonville's Craig Municipal Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

5.3.2.8. 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. Even though Duval County, Florida, is flat, Florida choose to use 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 1992 National Land Cover Dataset.

While Duval County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

5.3.2.9. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose to use a tier 1 approach. Data were obtained from 2012-2014 time period from the Winter Park monitor (AQS Site: AQS site ID # 12-095-2002), approximately 200 km south of the JEA NGS/SJRPP facility. The Winter Park monitor was chosen due to its location in a similar urban area and its large distance from any major source of SO_2 making it well placed for estimating background concentrations of SO_2 in Florida's urban areas. The 2012-2014 design value for this monitor was 5 parts per billion (ppb) or 13.1 $\mu g/m^3$. This value was added to the model results at all receptors and for all hours using the tier 1 approach.

Florida's January 13, 2017, Modeling Report included data for 2012-2014 from the Kooker Park SO_2 monitor operated by the City of Jacksonville. These data were used to develop a background concentration that was added to the modeling results to account for all sources not explicitly included in the modeling demonstration. A recent audit of the Duval County monitoring network performed by the EPA has, however, revealed potential data quality issues for 2014. Florida, in consultation with the EPA, submitted a supplemental modeling demonstration for Duval County. This supplemental demonstration incorporates a background concentration from a monitor not affected by the potential data quality issues. With the exception of the substituted background data, the updated modeling demonstration is identical to Florida's original submittal on January 13, 2017.

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is representative of urban area background concentrations and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

5.3.2.10. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Duval County, Florida area of analysis are summarized below in Table 43.

Table 43. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Duval County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	6
Modeled Stacks	9
Modeled Structures	20
Modeled Fencelines	2
Total receptors	8,991
Emissions Type	Mixed/Hybrid
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Jacksonville's Craig Municipal Airport
NWS Station Upper Air Meteorology	Jacksonville International Airport
NWS Station for Calculating Surface Characteristics	Jacksonville's Craig Municipal Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site #12-095-2002, "Tier 1" approach
Calculated Background SO_2 Concentration	13.1μg/m^3

The results presented below in Table 44 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

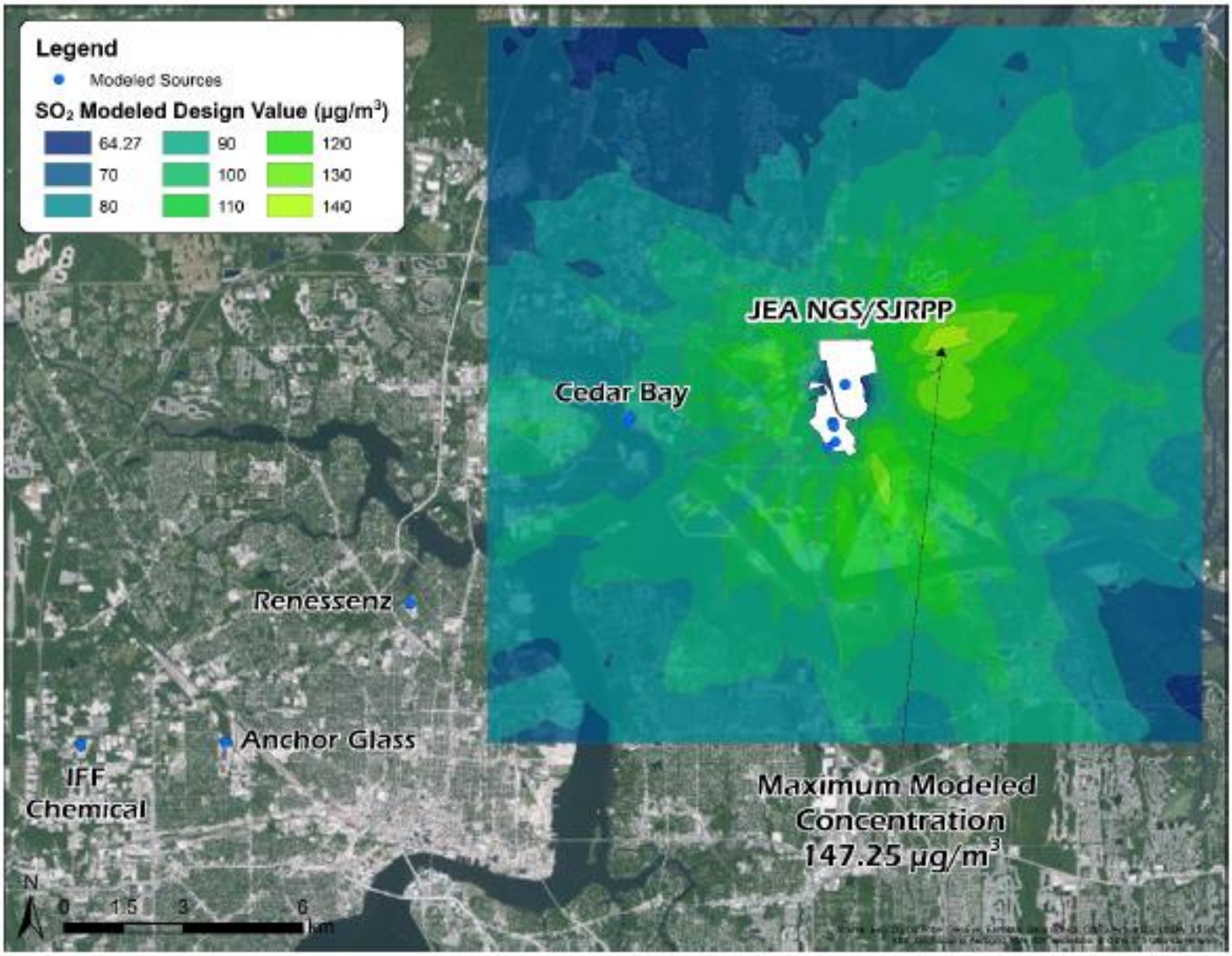
Table 44. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Duval County Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration (μg/m^3)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	447,087.08	3,366,660.94	147.25	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 μg/m^3 conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 147.25 µg/m^3, equivalent to 56.22 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual and PTE emissions from the facilities. Figure 40 below was included as part of the State's recommendation, and indicates that the predicted value occurred on Florida's eastern coastal area. The State's receptor grid is also shown in the figure.

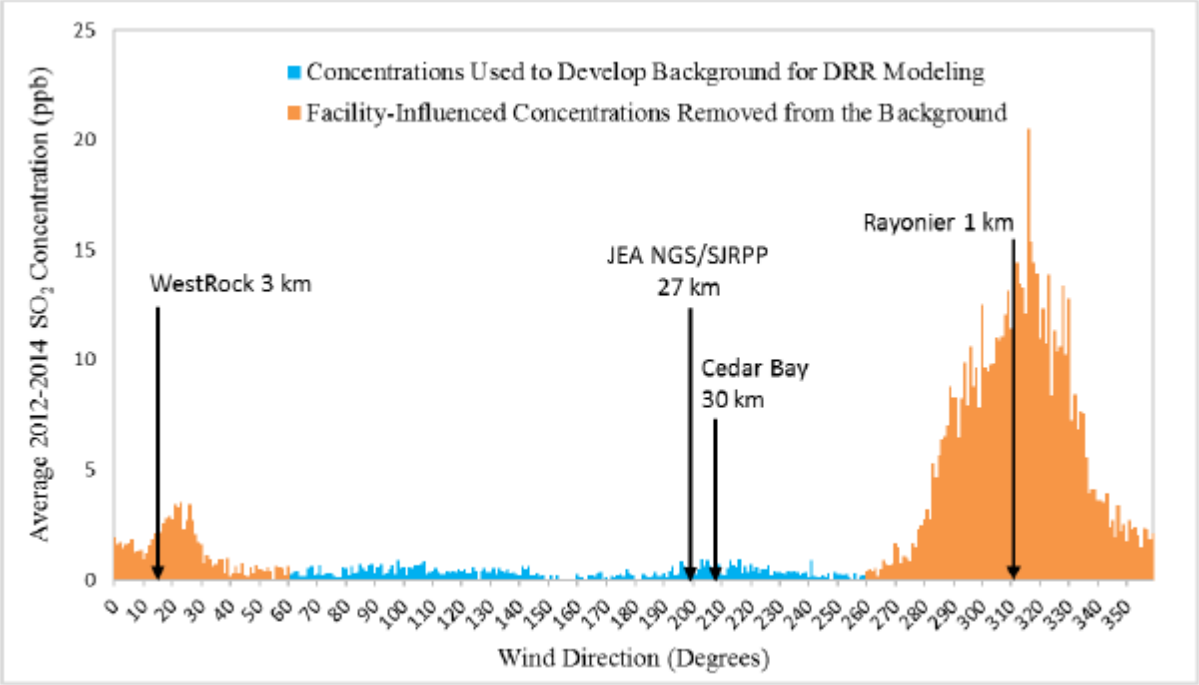
Figure 40. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Duval County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration.

The State's modeling report for the Duval County area does not address whether emissions from the JEA NGS/SJRPP facilities have the potential to contribute to violations in the existing Nassau County nonattainment area located approximately 30 km from JEA NGS/SJRPP. However, in the State's modeling report for the Nassau County area, Florida provided an analysis of the monitoring data from the ambient monitor located inside the nonattainment boundary to show a very small impact at the monitor when the winds blow from the direction of the JEA NGS/SJRPP facilities. Figure 41 from Florida's Nassau County Modeling report provides this demonstration.

Figure 41. 2012-2014 average SO_2 concentrations by wind direction for Fernandina Beach monitor (AQS Site: AQS site ID # 12-089-0005.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA agrees with Florida's assessment. Additionally, we note that the Fernandina Beach monitor is now showing attainment of the 1-hour SO_2 NAAQS and the EPA recently approved Florida's attainment demonstration SIP submittal for the Nassau County area[18] (see the discussion in the Nassau County area later in this chapter for additional information). Therefore, the EPA believes that the JEA NGS/SJRPP facilities are not contributing to any violations of the 1-hour SO_2 NAAQS.

[18] 82 FR 30749 (July 3, 2017).

5.3.2.11. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the JEA NGS/SJRPP facilities. Given the criteria for selecting nearby sources, we believe that the decision to include four additional facilities (Cedar Bay, Renessenz, Anchor Glass, and IFF Chemical), and excluding all other sources from the modeling analysis was correct. A mix of actual emissions from the 2012-14 period along with permitted allowable emissions for some units were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the JEA NGS/SJRPP facilities. Additionally, the EPA believes that the JEA NGS/SJRPP facilities are not contributing to any violations of the 1-hour SO_2 NAAQS.

5.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Duval 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.

5.5. Jurisdictional Boundaries in the Duval County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Duval County. This factor did not play a significant role in the EPA's analysis.

5.6. Other Information Relevant to the Designations for the Duval County Area

Florida indicates that it expects that the ambient concentrations and emissions of SO_2 in Duval County will continue to fall as they have for at least the past decade. In 2015 emissions of SO_2 at NGS/SJRPP were more than 70% less than in 2014.

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Duval County. The State anticipates that the implementation of a variety of national rules and regulations (particularly the MATS) and economic forcing will result in the maintenance or even further reduction of these lower levels of SO_2 emissions ensuring continued compliance with the NAAQS. In addition, the Cedar Bay facility permanently cease operations in December 2016.

5.7. The EPA's Assessment of the Available Information for the Duval County Area

The EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the EPA believes that the JEA NGS/SJRPP facilities are not contributing to any violations of the 1-hour SO_2 NAAQS.

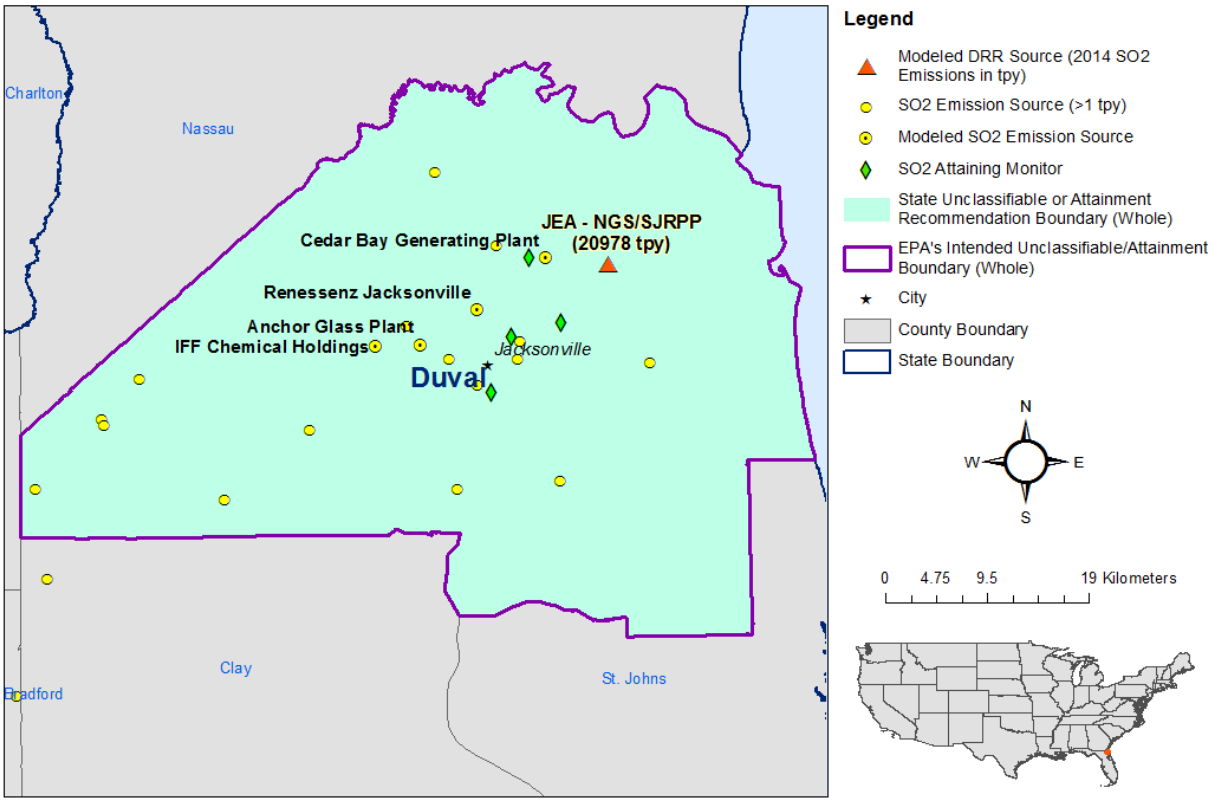
The EPA believes that our intended unclassifiable/attainment area, bounded by Duval County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

5.8. Summary of Our Intended Designation for the Duval 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 Duval County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of Duval County (in its entirety.) Although the State recommended that the area surrounding the JEA NGS/SJRPP facility be designated "attainment" or "unclassifiable," the EPA's intended whole county boundary is consistent with the approach used in prior designations for counties with no monitored or modeled violation.

Figure 42 shows the boundary of this intended designated area.

Figure 42. Boundary of the Intended Duval County Unclassifiable/Attainment Area



6. Technical Analysis for the Escambia County Area

6.1. Introduction

The EPA must designate the Escambia County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Escambia County.

6.2. Air Quality Monitoring Data for the Escambia County Area

This factor considers the SO_2 air quality monitoring data in the area of Escambia County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data:

- The Ellyson Industrial Park SO_2 monitor (AQS ID: 12-033-0004) is located at 30.525367, -87.20355 in Escambia County. The monitor is located in Ferry Pass, Florida, 3.2 miles southeast of Crist Electric Generating Station. Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent monitored SO_2 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 SO_2 design value of 16 ppb. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations near Crist Electric Generating Station or the area so it cannot be used to designate the area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Escambia County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

6.3. Air Quality Modeling Analysis for the Escambia County Area Addressing Crist Electric Generating Station

6.3.1. Introduction

This section 6.3 presents all the available air quality modeling information for a portion of Escambia County that includes Crist Electric Generating Station. (This portion of Escambia County will often be referred to as "the Escambia County area" within this section 6.3). This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The Crist Electric Generating Station (Crist) emitted 2,000 tons or more annually. Specifically, Crist Electric Generating Station emitted 2,819.60 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

- The International Paper Pensacola facility emitted 127.13 tons of SO_2 in 2014. The total emissions from this facility was under 2,000 tpy and was not listed under the DRR. Florida, however, included the International Paper Pensacola facility in their modeling of Crist Electric Generating Station because the State automatically included all sources within 20 km of any DRR source that had 2014 SO_2 emissions of at least 100 tons.

Because we have available results of air quality modeling in which these sources are modeled together, the area around this group of sources is being addressed in this section with consideration given to the impacts of all these sources.

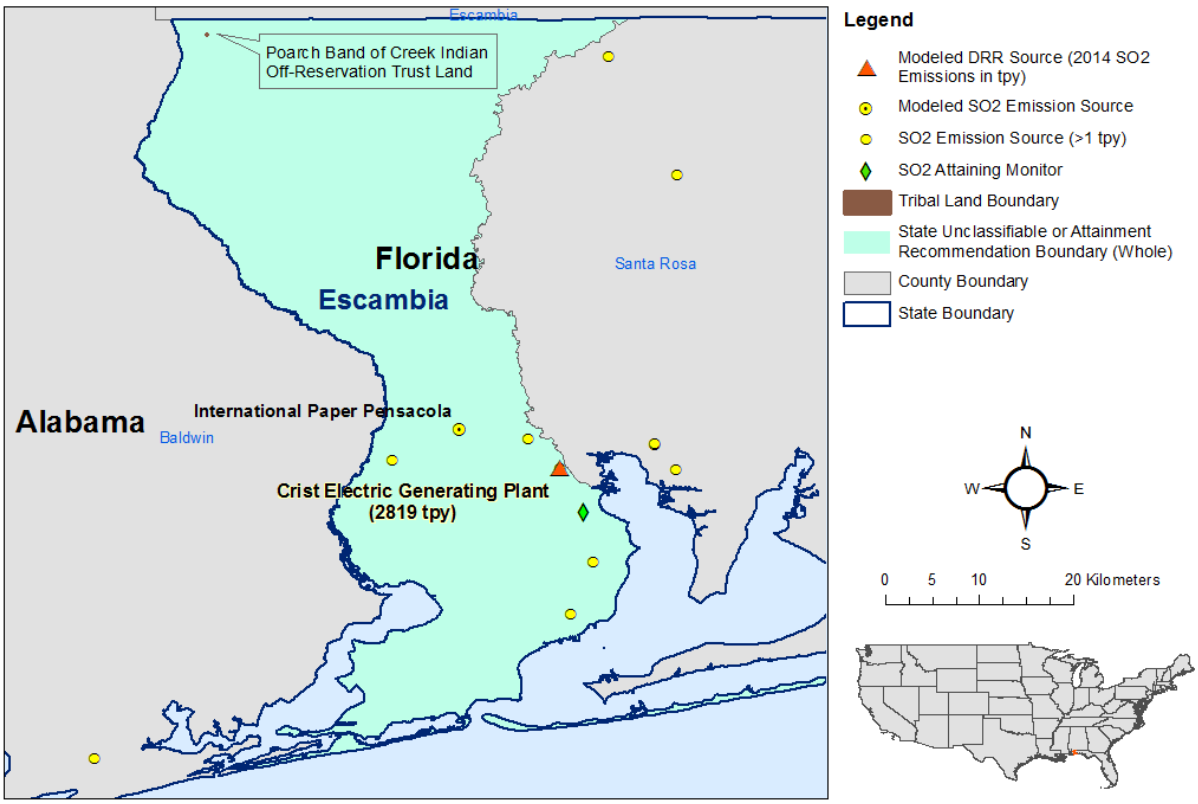
In its submission, Florida recommended that an area that includes the area surrounding the Crist Electric Generating Station, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. 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 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 Escambia County near Escambia Bay.

As seen in Figure 43 below, the Crist facility is located northwestern portion of Florida near Escambia Bay.

Also included in the figure are other nearby emitters of SO_2.[19] These are Ascend Performance Materials, Gulf Power Pea Ridge Plant, Taminco US Pace Plant, International Paper Pensacola, Santa Rosa Energy Center, Gulf Power Perdido Landfill, and Petro Blackjack Jay Facility. All of the non-modeled sources are within 35 km of the DRR source. Sources are located in the Pensacola area near Escambia Bay.

Figure 43. Map of the Escambia County Area Addressing Crist. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the

[19] All other SO_2 emitters of 2,000 tpy or more based on information provided by the State of Florida are shown in Figure 43. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 45. Modeling Assessments for the Escambia County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida DEP	01/13/2017	Escambia County Modeling Report	
Florida DEP	06/30/2016	Florida Modeling Protocol	Protocol

6.3.2. Modeling Analysis Provided by the State

The State submitted the DRR modeling protocol to the EPA staff in June 2016. After the review was conducted, the EPA staff identified no issues with the modeling protocol that was provided. The Escambia County Modeling Report does not show any significant changes from the inputs, model versions, or assessments of the protocol. The conclusions provided in the protocol are similar to the modeling assessment in the report. The Escambia County Modeling Report from the State is primarily used in this chapter, but other details from the protocol may be relevant.

6.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the

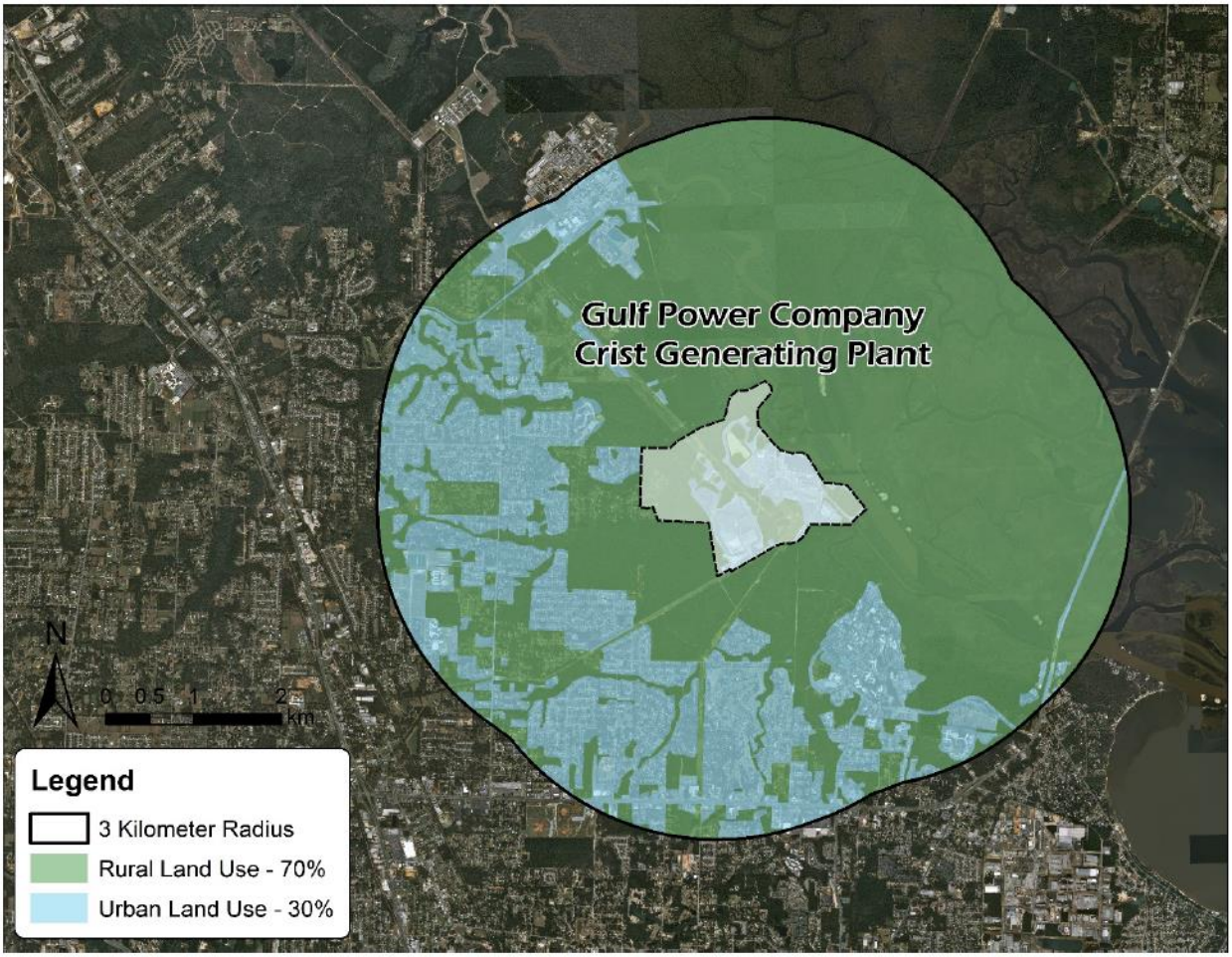
State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

6.3.2.2. Modeling Parameter: Rural or Urban Dispersion

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

AERMOD contains different dispersion coefficients for rural and urban settings. Appendix W outlines two methods for determining whether the area should be considered rural or urban. Florida chose the land-use classification approach employing Auer's method. The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. Florida has determined that the land use consists of rural land use constitutes a majority (70 percent) of the 3-km radius around Crist. Figure 44 depicts the land use representation of the Auer method.

Figure 44. Land use for the Crist Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA agrees that the area surrounding the source can be classified as rural, consistent with the Auer method for determining land use classification detailed in Section 6.3 of the Modeling TAD.

6.3.2.3. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Escambia County area, the State has included one other emitter of SO_2

within 35 km of Crist in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to Crist, the other emitter of SO_2 included in the area of analysis are: International Paper Pensacola facility. Florida also assessed other SO_2 emissions sources in the Escambia County area. Table 46 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 46. SO_2 Emissions Sources within 35 km of the Big Bend Station. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from Crist (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
033-0045	Gulf Power Crist Plant [a]	0	0	2,819.60	Yes
033-0040	Ascend Performance Materials	5	100	15.72	No
113-0173	Gulf Power Pea Ridge Plant	8	160	2.58	No
113-0004	Taminco US Pace Plant	9	180	10.67	No
033-0042	International Paper Pensacola [a]	10	200	127.13	No
113-0168	Santa Rosa Energy Center	11	220	1.06	No
033-0286	Gulf Power Perdido Landfill	16	320	1.66	No
113-0014	Petro Blackjack Jay Facility	33	660	24.35	No

a. Explicitly modeled facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the Crist.

No other sources beyond 35km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

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

Based on this guidance, the State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within Crist's fence line were removed and receptors were placed with 50 m spacing along the fence line. Receptor grid parameters are listed in Table 47.

Table 47. Dense Receptor Grid Parameter. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Boilers 4-7 Combined FGD Stack
Unit UTM Zone	16N
Unit UTM Easting (m)	478,250.42
Unit UTM Northing (m)	3,381,610.45
Actual Stack Height (m)	149.40
Expected Distance to Max Concentration (m)	1,494
20 Times Stack Height (m)	2,988
100 m Receptor Spacing - Extent from the Origin (m)	3,000
250 m Receptor Spacing - Extent from the Origin (m)	5,500
500 m Receptor Spacing - Extent from the Origin (m)	8,000
Plant Boundary Receptor Spacing (m)	50
Total Receptors	5,596

The receptor network contained 5,596 receptors, and the network covered the northwestern portion of Florida along the eastern side of the Escambia Bay.

Figures 45 and 46, included in the State's recommendation, show the State's chosen area of analysis surrounding the 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 locations that would be considered ambient air relative to each modeled facility, including other facilities' property. The State chose not to employ the process in the Modeling TAD described in Section 4.2 regarding the removal of receptors as not being feasible locations for placing a monitor. They instead included receptors in all areas the State considered ambient air within 8 km of Crist. Figure 46 from the Florida Modeling Report shows the Crist fence line boundary. However, no information was provided in Florida's Modeling Report for the Escambia County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[20] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

[20] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 45. Area of Analysis for the Escambia County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

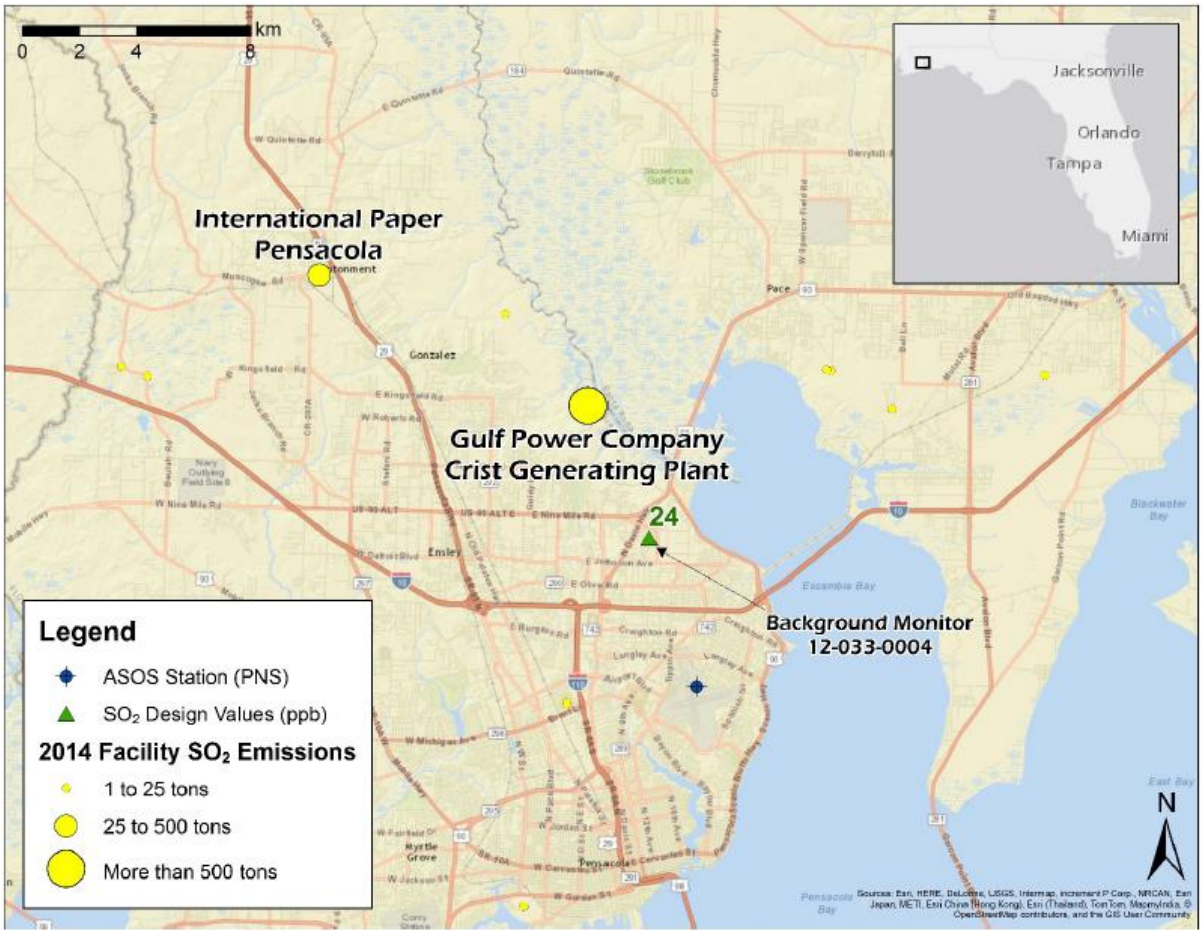
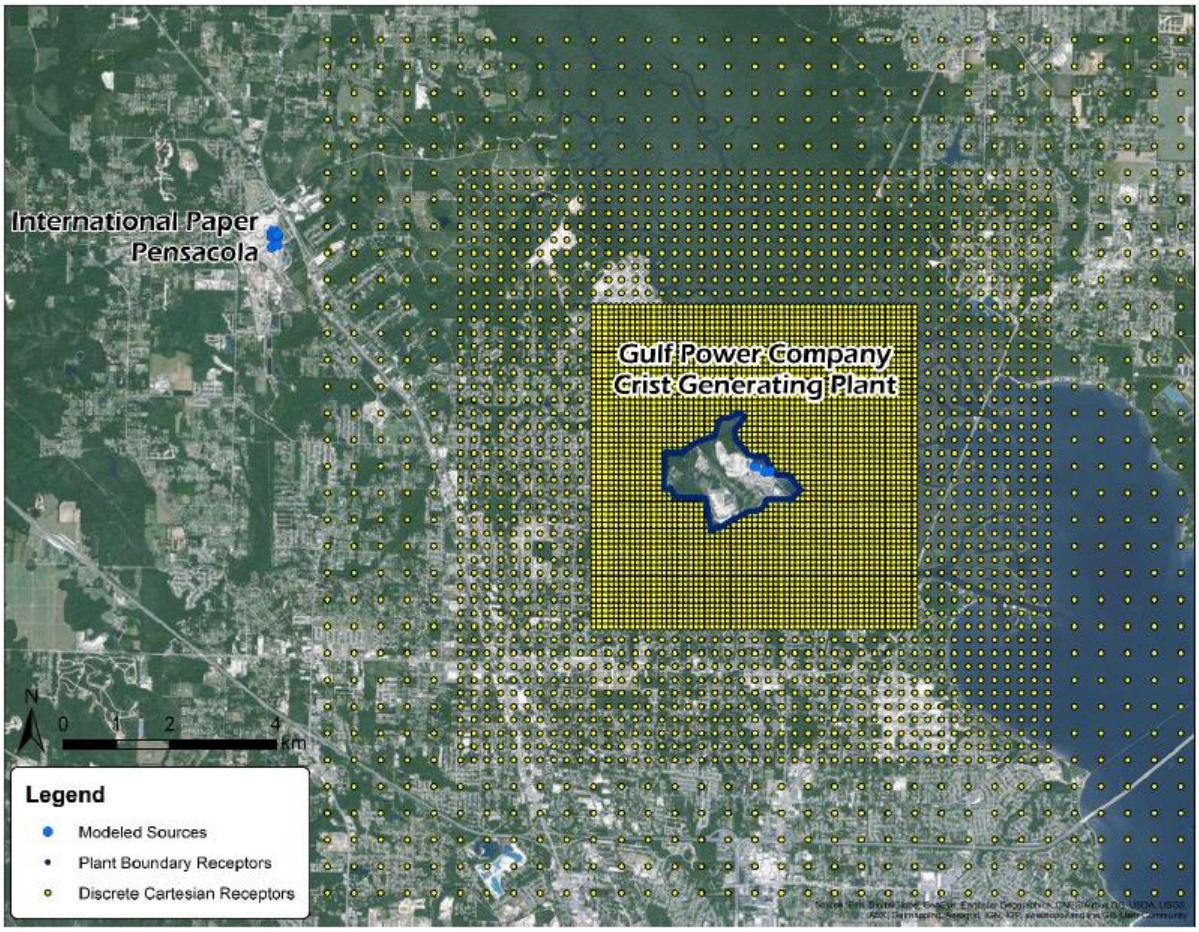


Figure 46. Receptor Grid for the Escambia County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



6.3.2.4.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 state used the Q/D >20 metric within 35 km to identify all possible facilities that had the potential to be included in the modeling. The nearby facilities evaluated in this report were: Ascend Performance Materials, Gulf Power Pea Ridge Plant, Taminco US Pace Plant, International Paper Pensacola, Santa Rosa Energy Center, Gulf Power Perdido Landfill, and Petro Blackjack Jay Facility. A Q/D value was then developed for each facility on the list, where Q represents the 2014 actual SO_2 tpy emissions totals, and D represents the distance between the two facilities. If the Q/D metric yielded a value of greater than 20, the facility was retained and additional QA/QC was performed on a unit by unit basis. Using this methodology, no additional facilities were identified; however, the State included International Paper Pensacola since it is

located approximately 10 km to the northwest of Crist and the State asserted it is the only other source of SO_2 that has the potential to cause a concentration gradient in the area of interest.

The State characterized these 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 BPIPPRM was used to assist in addressing building downwash.

The EPA has concluded that this component of the modeling analysis was performed in a manner consistent with the SO_2 Modeling TAD.

6.3.2.5. 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 SO_2 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 SO_2 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 Crist and one other emitter of SO_2 within 35 km in the area of analysis. The State has chosen to model the Crist and International Paper Pensacola facilities using actual emissions. The facilities in the State's modeling analysis and their associated annual actual SO_2 emissions between 2012-2014 are summarized below.

For Crist and International Paper Pensacola, the State provided annual actual SO_2 emissions between 2012-2014. This information is summarized in Table 48. A description of how the State obtained hourly emission rates is given below this table. The State also evaluated 2015 emissions from Plant Crist and determined that 2015 emissions of SO_2 at Crist were 65 percent less than 2014.

Table 48. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Escambia County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Gulf Power Crist Plant	947	1,962	3,086
International Paper Pensacola Facility	147	123	127
Total Emissions from All Modeled Facilities in the State's Area of Analysis	1,069	2,083	3,227

For Crist, the actual hourly emissions data were obtained from CEMS. For the International Paper Pensacola facility, the actual emissions were obtained from a mixture of CEMS and derived hourly values based on fuel usage and emission factors CEMS data was recorded for two of the facility's power boilers. The remaining units, which included a thermal oxidizer, lime kiln, recovery boilers and smelt dissolving tanks, estimated actual hourly using fuel throughput or heat input data and a variety of emission factors.

The EPA agrees with Florida's use of actual emissions for the Crist and International Paper Pensacola facilities. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

6.3.2.6 Modeling Parameter: Meteorology and Surface Characteristics

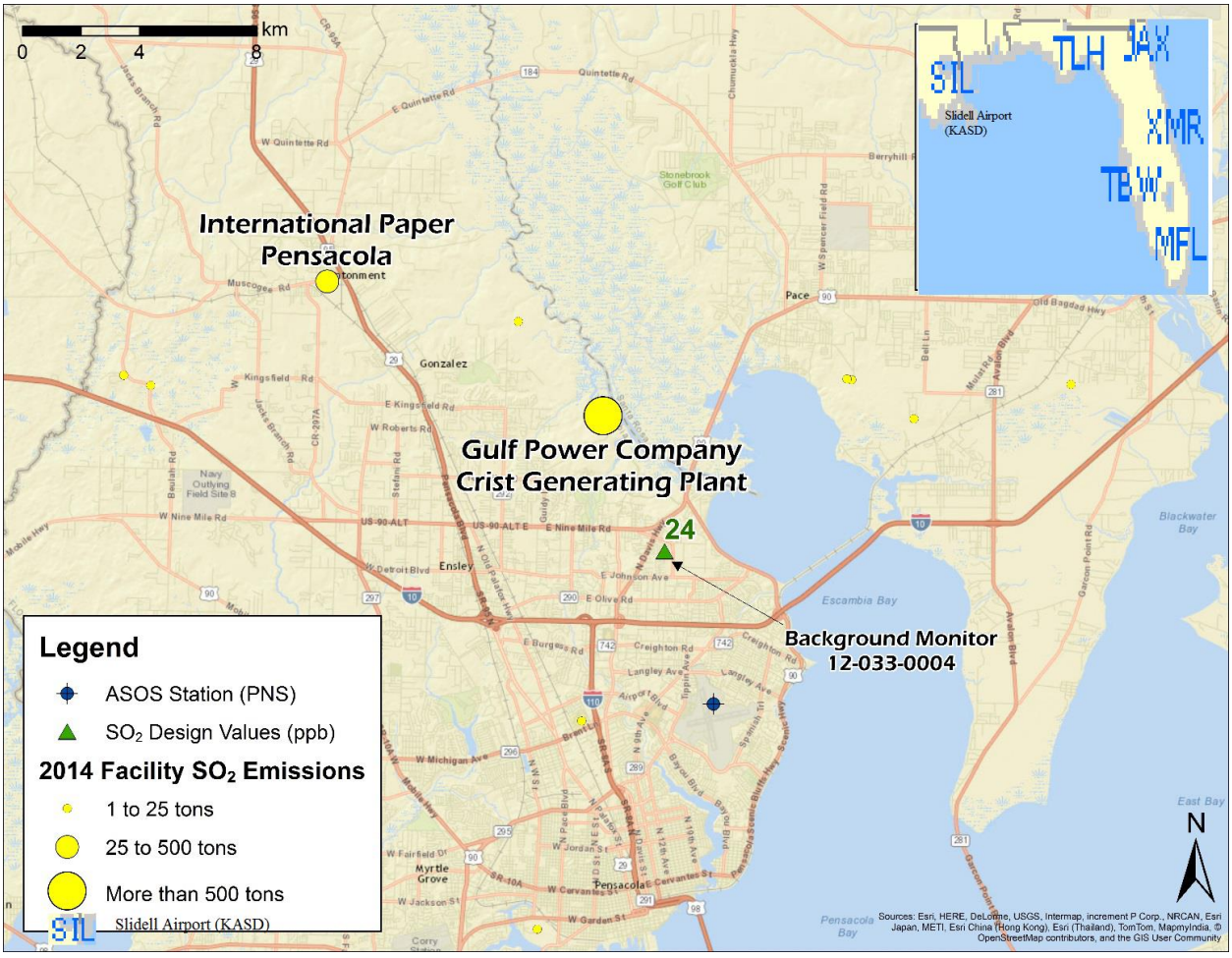
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Escambia County area, the State selected the surface meteorology Pensacola International Airport, located approximately 10 km southeast of the Crist Electric Generating facility, and coincident upper air observations from Slidell, Louisiana as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from Pensacola International 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 “zo.” The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

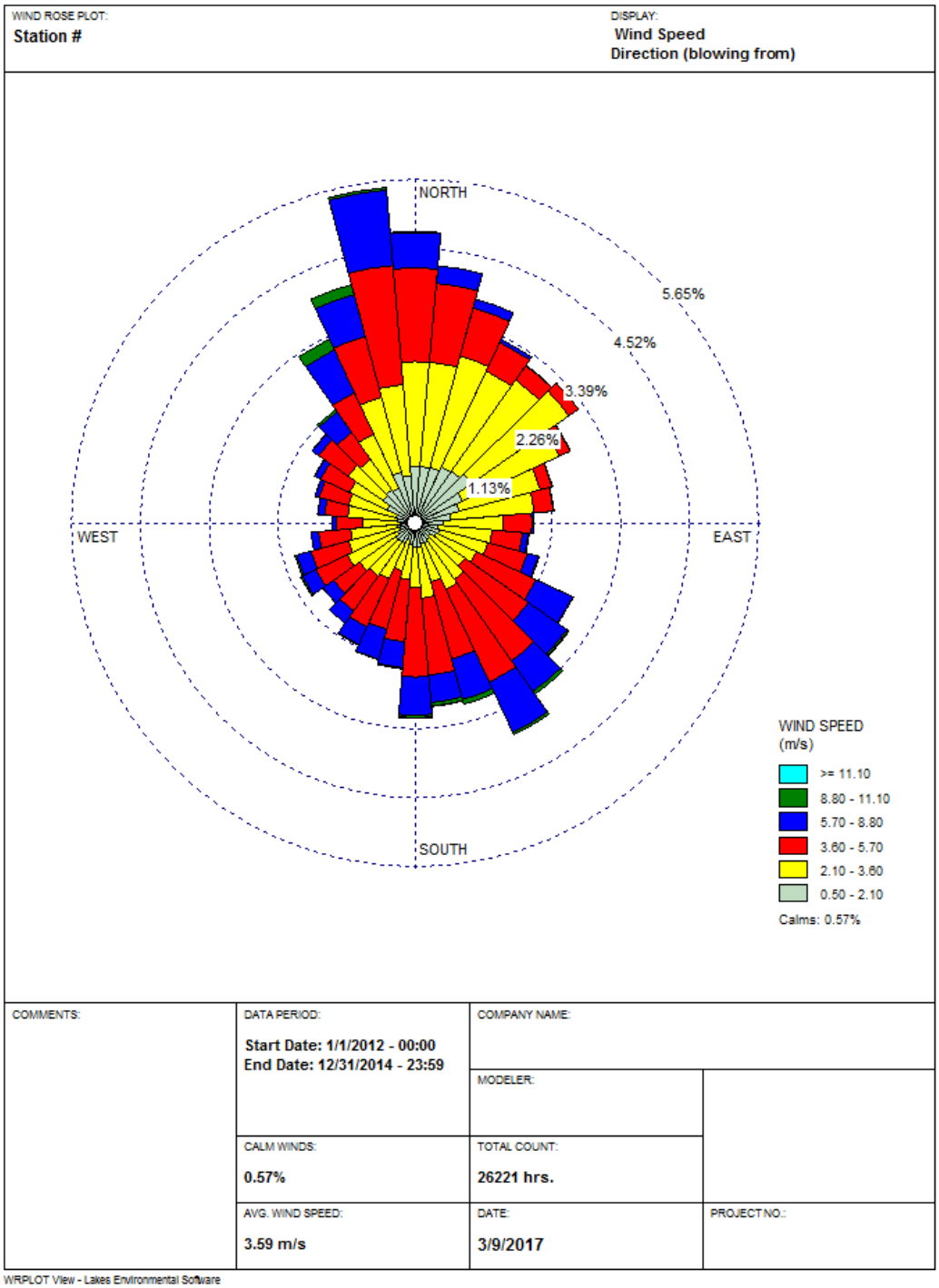
In the figure below, the locations of these NWS stations is shown relative to the area of analysis.

Figure 47. Area of Analysis and the NWS stations in the Escambia County Area of Analysis and the NWS stations in the Escambia County, FL Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Pensacola International Airport for the 2012-2014 period. In Figure 48, 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 predominately blow from the north, northeast and southeast directions.

Figure 48. Pensacola International Airport 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 DRR modeling TAD and Appendix W 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 Pensacola International Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology Pensacola International Airport, located approximately 10 km southeast of the Crist Electric Generating facility, and coincident upper air observations from Slidell, Louisiana as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Crist Electric Generating facility can be expected to the south of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Pensacola International Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

6.3.2.6. 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. 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 1992 National Land Cover Dataset.

While Escambia County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

6.3.2.7. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 99^{th} percentile monitored concentrations by hour of day and season or month. Data were obtained from 2012-2014 time period from the Ellyson Industrial Park monitor (AQS Site: AQS site ID # 12-033-0004), approximately 5.0 km southeast of the Crist facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the background concentration data to remove measurements when the wind direction could transport pollutants from either the Crist or International Paper – Pensacola facilities. In this case, any measurement recorded when the wind direction was from 290° to 19° (between WNW and NNE) was removed from the background calculation. Finally, Florida used the 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. See Table 49 for the hourly values modeled and sorted by season.

Florida use of the "tier 2" method and AERMOD's SO command BACKGRND SEASHR keyword was correctly used in DRR modeling for the Crist facility.

Table 49. 2012-2014 SO_2 background concentrations (ppb) by hour-of-day by season for the Escambia County DRR modeling demonstration. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.00	1.33	2.00	1.33	12:00	2.67	1.67	2.33	5.67
1:00	1.33	1.00	1.67	1.33	13:00	2.00	1.67	2.33	4.00
2:00	1.33	1.00	1.67	1.33	14:00	2.33	2.00	2.00	2.33
3:00	1.33	1.00	1.67	1.33	15:00	2.33	1.33	2.33	2.33
4:00	1.33	1.00	2.00	1.33	16:00	1.67	2.00	2.33	1.67
5:00	1.33	1.00	2.00	1.33	17:00	1.67	1.67	2.67	2.00
6:00	1.33	1.67	2.00	1.33	18:00	2.33	1.67	2.00	2.33
7:00	2.00	2.33	2.67	2.33	19:00	8.00	2.00	4.33	3.67
8:00	2.33	3.33	3.33	2.00	20:00	2.33	1.33	2.33	2.33
9:00	4.33	3.00	3.00	3.00	21:00	1.67	1.00	1.67	1.33
10:00	3.67	3.33	3.33	3.00	22:00	1.67	1.00	1.67	1.33
11:00	3.33	2.33	2.67	3.00	23:00	2.00	1.33	2.00	1.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

6.3.2.8. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Escambia County, Florida area of analysis are summarized below in Table 50.

Table 50. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Escambia County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	2
Modeled Stacks	3
Modeled Structures	13
Modeled Fencelines	1
Total receptors	5,596
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Pensacola International Airport
NWS Station Upper Air Meteorology	Slidell, Louisiana
NWS Station for Calculating Surface Characteristics	Pensacola International Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site # 12-033-0004, Tier 2 based on temporally varying approach.
Calculated Background SO_2 Concentration	2.619 – 20.95 $\mu g/m^3$

The results presented below in Table 51 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

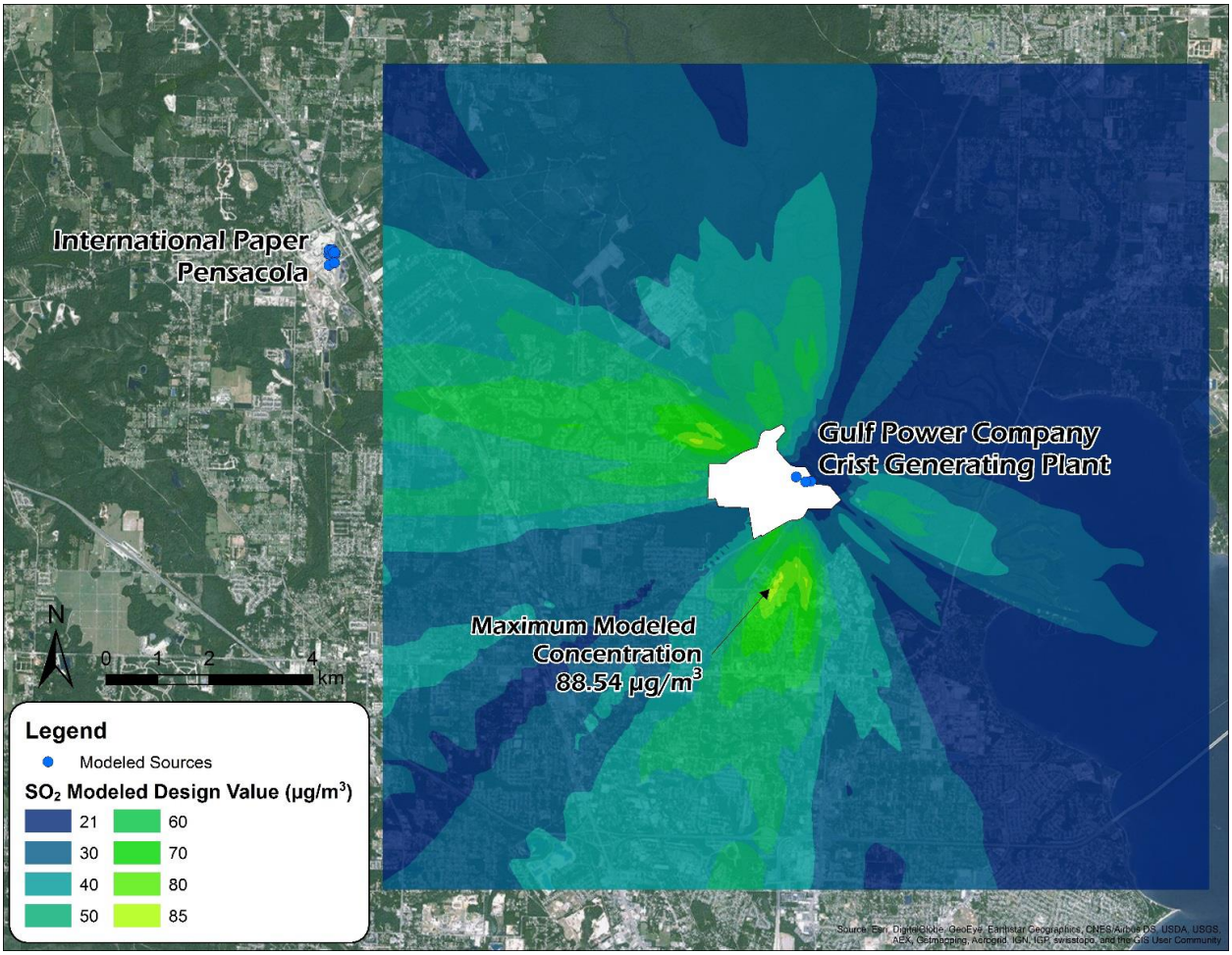
Table 51. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Escambia County Area

Averaging Period	Data Period	Receptor Location 16N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	477,850.41	3,379,510.50	88.54	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 88.54 $\mu g/m^3$, equivalent to 33.8 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual emissions from the facilities. Figure 49 below was included as part of the State's recommendation, and indicates that the predicted value occurred to south-southeast of the Gulf Power Crist Plant DRR source. The extent of the State's receptor grid is also shown in the figure.

Figure 49. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Escambia County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Additionally, based on the available information for the remaining areas in Florida, including monitoring and modeling, there are no current SO_2 nonattainment areas near Hamilton County, Florida, and no expected nonattainment areas for this third round of designations. Therefore, the Hamilton County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

6.3.2.9. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the Crist Electric Generating Station. Given the criteria for selecting nearby sources, we believe that the decision to include one additional facilities (International Paper Pensacola), and excluding all other sources from the modeling analysis was correct. Actual emissions from the 2012-14 period were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the Crist Generating Station. Additionally, the EPA believes that Crist Generating Stations is not contributing to any violations of the 1-hour SO_2 NAAQS.

6.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Escambia 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.

6.5. Jurisdictional Boundaries in the Escambia County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Escambia County. This factor did not play a significant role in EPA's analysis.

6.6. Other Information Relevant to the Designations for the Escambia County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Escambia County. The State anticipates that the implementation of a variety of national rules and regulations (particularly the MATS) and economic forcing will result in the maintenance or even further reduction of these lower levels of SO_2 emissions ensuring continued compliance with the NAAQS.

6.7. The EPA's Assessment of the Available Information for the Escambia County Area

EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the EPA believes that Crist Generating Stations is not contributing to any violations of the 1-hour SO_2 NAAQS.

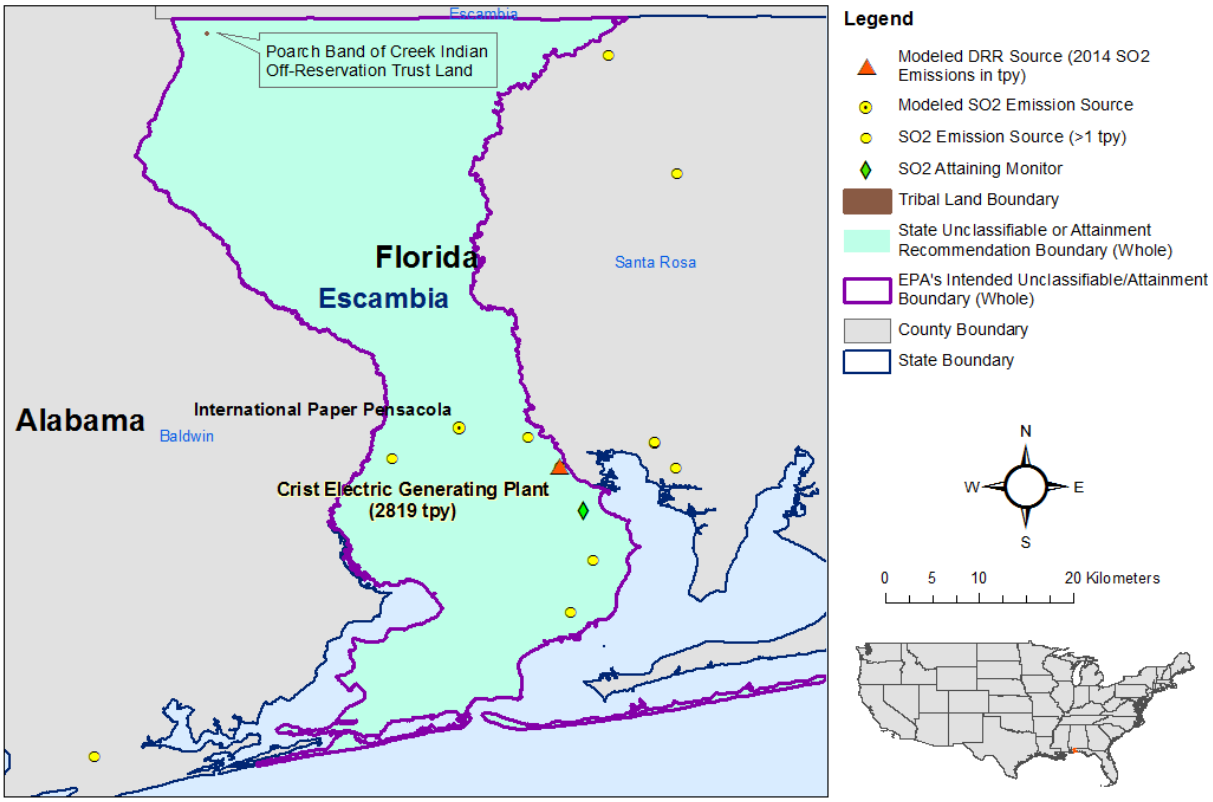
The EPA believes that our intended unclassifiable/attainment area, bounded by Escambia County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

6.8. Summary of Our Intended Designation for the Escambia 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 Escambia County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of Escambia County (in its entirety.) Although the State recommended that the area surrounding the Crist facility be designated "attainment" or "unclassifiable," the EPA's intended whole county boundary is consistent with the approach used in prior designations for counties with no monitored or modeled violation.

Figure 50 shows the boundary of this intended designated area.

Figure 50. Boundary of the Intended Escambia County Unclassifiable/Attainment Area



7. Technical Analysis for the Hamilton County Area

7.1. Introduction

The EPA must designate the Hamilton County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Hamilton County.

7.2. Air Quality Monitoring Data for the Hamilton County Area

This factor considers the SO_2 air quality monitoring data in the area of Hamilton County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data:

- The White Springs SO_2 monitor (AQS ID: 12-047-0015) is located at 30.411339, -82.783484 in Hamilton County. The monitor is located in White Springs, Florida, 2.1 miles southeast of PCS White Springs. Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent monitored SO_2 levels are below the 1-hr NAAQS based on incomplete data. The monitor did not produce a valid design value based on the most recent three years of data (2014-2016), because the data collected in 2016 was invalidated due to data quality findings in a Technical Systems Audit performed by the EPA. For 2014-2016, the monitor indicates an invalid, incomplete 1-hr SO_2 design value of 16 ppb. For 2013-2015, the monitor collected a valid 1-hr SO_2 design value of 19 ppb. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations near PCS White Springs or the area so it cannot be used to designate the area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Hamilton County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

7.3. Air Quality Modeling Analysis for the Hamilton County Area Addressing White Springs Agricultural Chemicals Suwannee River/Swift Creek Complex

7.3.1. Introduction

This section 7.3 presents all the available air quality modeling information for a portion of Hamilton County that includes PCS White Springs. (This portion of Hamilton County will often be referred to as "the Hamilton County area" within this section 7.3). This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The PCS White Springs facility emitted 2,000 tons or more annually. Specifically, PCS White Springs emitted 2,487.19 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

- The PCS Suwannee River Plant facility did not emit 2,000 tons or more annually and is not on the SO_2 DRR Source list, but was included in the modeling assessment. The Suwannee River Plant on the east side of the PCS White Springs Suwannee River/Swift Creek Complex mostly shutdown in 2014. Despite the fact that these units have not operated for over two years, Florida chose to include them in the modeling demonstration at their maximum permitted short-term emission rates, equivalent to 1225 tons per year.

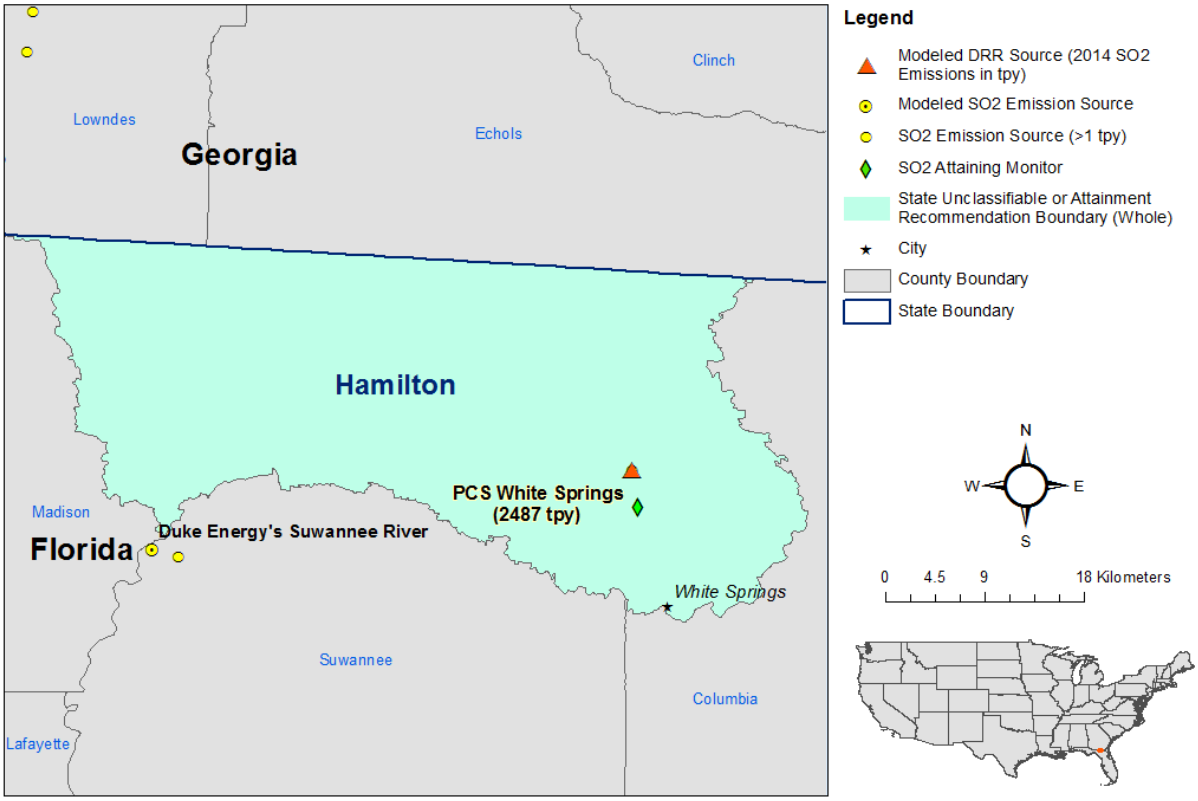
In its submission, Florida recommended that an area that includes the area surrounding the PCS White Springs, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing a mixture of actual and allowable emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA 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 the northern portion of Florida near the Florida/Georgia border. The area is in Hamilton County, specifically White Springs.

As seen in Figure 51 below, the PCS White Spring facility is located just east of US 41, approximately 10 miles northwest of White Springs, Florida.

Also included in the figure are other nearby emitters of SO_2 (the unmarked yellow dots on the map).[21] These are Duke Energy Suwannee Rive Plant, Pilgrim's Pride Live Oak Feed Mill and Pilgrim's Pride Live Oak Poultry Plant These facilities are within 35 km of the modeled facility residing within the city of White Springs.

Figure 51. Map of the Hamilton County, Florida Area Addressing PCS White Spring. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two different modeling assessments, including two assessments from the State and zero assessments from other parties. To avoid confusion in

[21] All other SO_2 emitters of 2,000 tpy or more based on information provided by the State of Florida are shown in Figure 51. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 52. Modeling Assessments for the Hamilton County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	01/13/2017	Florida Modeling Report	Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

7.3.2. Modeling Analysis Provided by the State

7.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

7.3.2.2. 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 SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 sources. Section 6.3 of the Modeling TAD

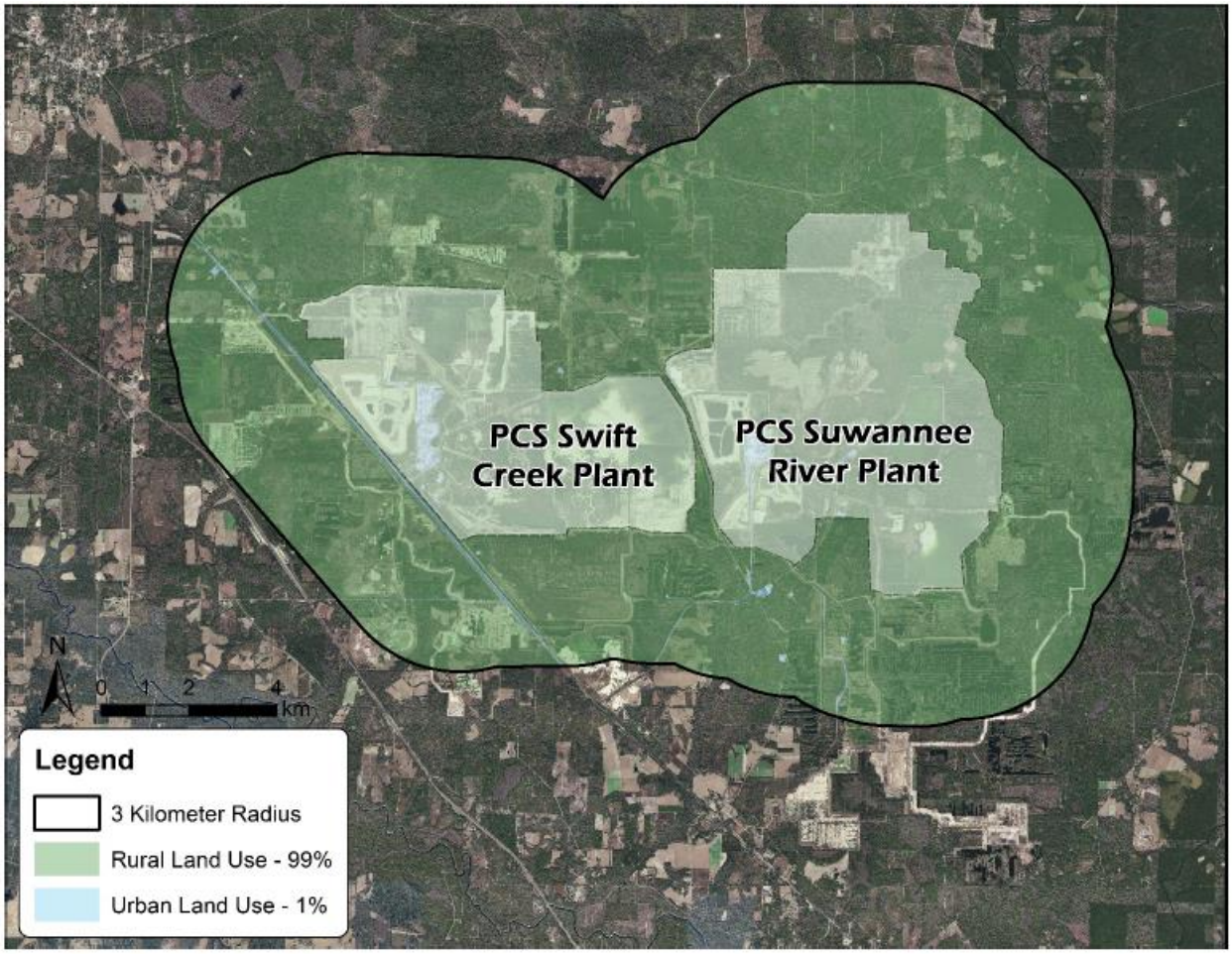
details the procedures used to determine if a source is urban or rural based on land use or population density.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. Florida utilized the Auer method and determined the land use of to be PCS White Springs is rural. Rural land use constitutes a majority (98 percent) of the 3-km radius around PCS.

Figure 52 depicts the land use representation of the Auer method.

Figure 52. Land use for the PCS White Springs Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA agrees that the area surrounding the source can be classified as rural, consistent with the Auer method for determining land use classification detailed in Section 6.3 of the Modeling TAD.

7.3.2.3. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The sources of SO_2 emissions subject to the DRR in this area are described in the introduction to this section. For the Hamilton County, Florida area, the State has included one other emitter of SO_2 within 35 km of PCS White Springs in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to PCS White Springs, the other emitters of SO_2 included in the area of analysis are: PCS Suwannee River Plant. Florida also assessed other SO_2 emissions sources in the Hamilton County area. Table 53 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 53. SO_2 Emissions Sources within 35 km of the PCS White Springs Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from PCS (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
047-0002	PCS White Springs	0	0	2,487.19	Yes
121-0007	Pilgrim's Pride Live Oak Feed Mill	21	420	0.01	No
121-0018	Pilgrim's Pride Live Oak Poultry Plant	30	600	5.50	No
121-0003	Duke Energy Suwannee River Plant	32	640	3.33	No

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the PCS White Springs facility.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

Based on this guidance, the State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of

receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within the PCS fenceline were removed and receptors were placed with 50 m spacing along the fenceline. Given the significant amount of contiguous mining land owned by PCS (the property boundaries encompass an area nearly 20 km across), this receptor spacing was not considered to be sufficient because it did not span the entire length of the property boundary. The receptor grid was then expanded to include all areas within 14 km of the largest emissions units at the PCS Swift Creek Plant. Receptor parameters are depicted in Table 54.

Table 55. Dense Receptor Grid for the PCS White Springs Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Sulfuric Acid Plant E
Unit UTM Zone	17N
Unit UTM Easting (m)	321,089.70
Unit UTM Northing (m)	3,370,331.20
Actual Stack Height (m)	59.50
Expected Distance to Max Concentration (m)	595
20 Times Stack Height (m)	1,190
100 m Receptor Spacing - Extent from the Origin (m)	3,500
250 m Receptor Spacing - Extent from the Origin (m)	7,000
500 m Receptor Spacing - Extent from the Origin (m)	14,000
Plant Boundary Receptor Spacing (m)	50
Total Receptors	8,164

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

The receptor network contained 8,164 receptors, and the network covers the area around PCS in Hamilton County.

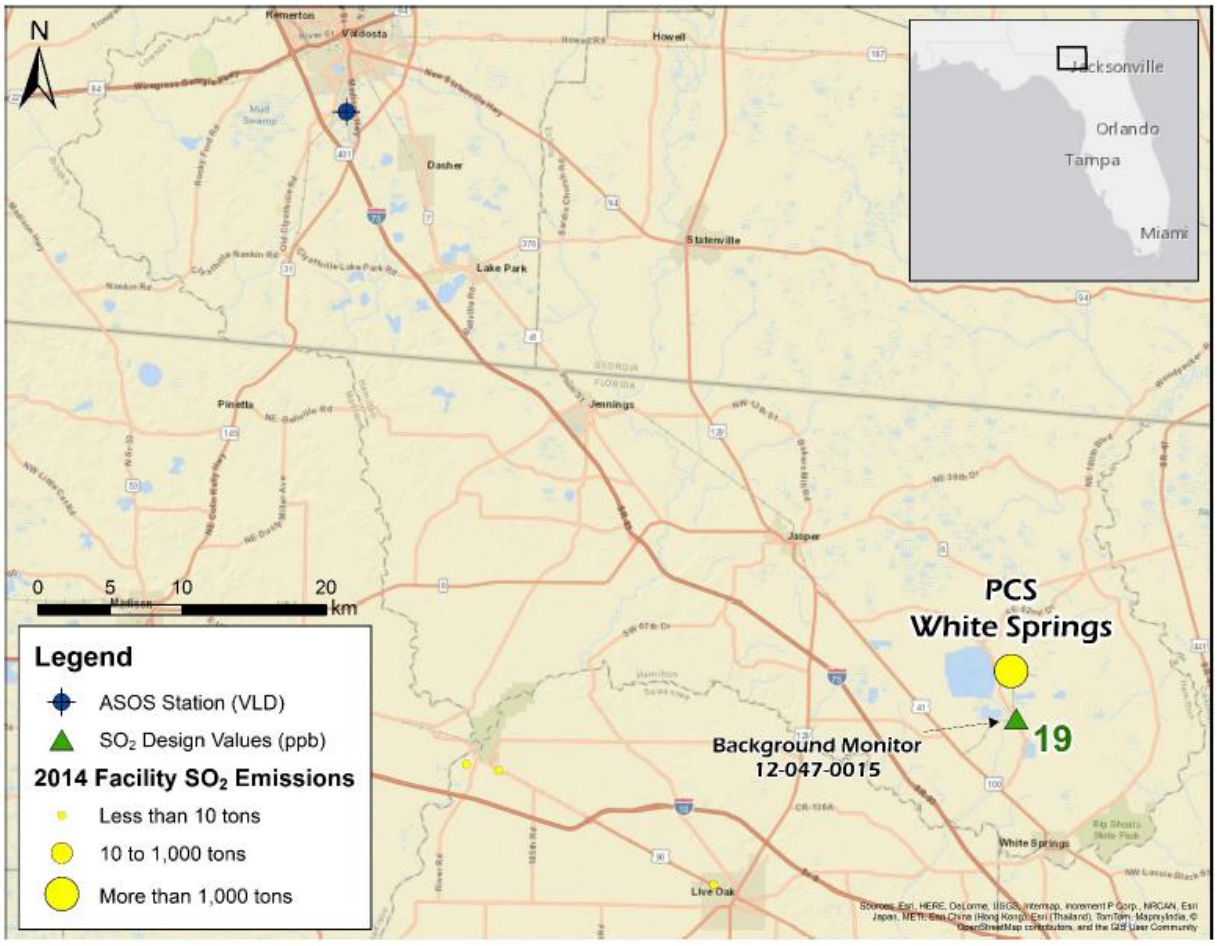
Figures 53 and 54, included in the State's recommendation, show the State's chosen area of analysis surrounding the PCS White Springs as well as the receptor grid for the area of analysis.

Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property with the exceptions of locations described in Section 4.2 of the Modeling TAD as not being feasible locations for placing a monitor. The state also did not place receptors in other locations that it considered to not be ambient air relative to each modeled facility. Figure 54 from the Florida Modeling Report shows the PCS White Springs fence line boundary. However, no information was provided in Florida's Modeling Report for the Hamilton County area to document that public access to the facility property is prevented by

a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[22] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Both the PCS White Springs Swift Creek Plant and Suwannee River Plant are owned and operated by PotashCorp. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries for both facilities is acceptable.

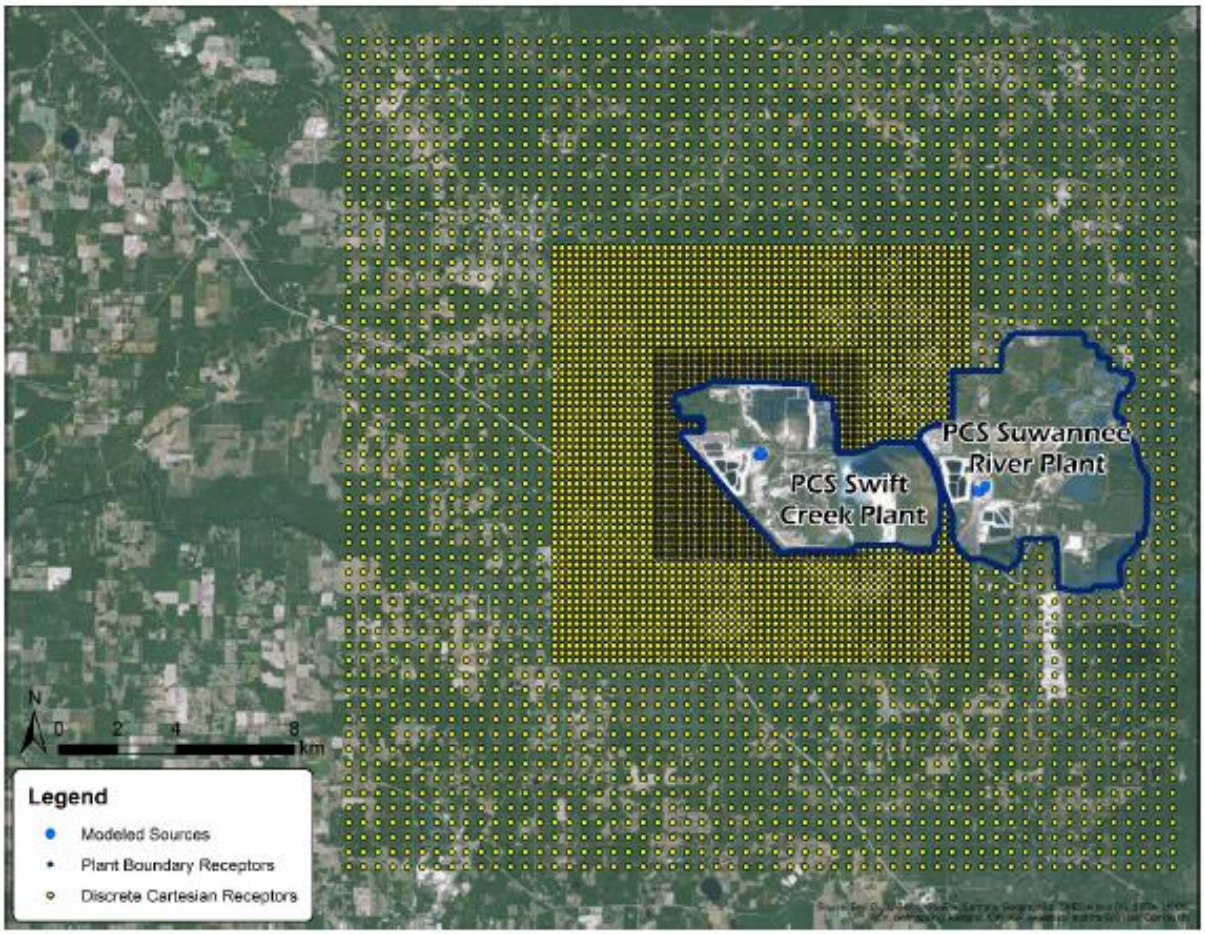
After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 53. Area of Analysis for the Hamilton County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[22] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 54. Receptor Grid for the Hamilton County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



7.3.2.4. Modeling Parameter: Source Characterization

The state used the Q/D >20 metric within 35 km to identify all possible facilities that had the potential to be included in the modeling. A Q/D value was then developed for each facility on the list, where Q represents the 2014 actual SO_2 tpy emissions totals, and D represents the distance between the two facilities. If the Q/D metric yielded a value of greater than 20, the facility was retained and additional QA/QC was performed on a unit by unit basis. Using this methodology, no additional facilities were identified. The state elected to include PCS Suwannee River Plant since although the main sources of SO_2 at this facility are shut down, they still remain permitted. The state chose to include them in the modeling demonstration at their maximum permitted short-term emission rates given their current permitted status.

The EPA reviewed all the other sources of SO_2 emissions in the area and determined that due to their distance from the PCS White Springs facility and their levels of emissions, they are not likely to have significant concentration gradients or impact the area near PCS White Springs.

Any potential impacts from the sources not explicitly modeled are accounted for in the analysis using representative background monitoring data from the Simmons monitor located approximately 8.5 km southwest of the facility.

The state characterized these 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 for the PCS White Springs sulfuric acid plants (SAP E & F) which are the primary source of SO_2 emissions. The remaining sources at PCS and the Suwannee River Plant were modeled with allowable emissions and actual stack heights because for each stack, the actual stack heights were less than the GEP formula height. 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees with Florida's method for characterizing the area. The use of actual stack heights for PCS White Springs and the Suwannee River Plant is appropriate. For sources that used allowable emissions, the actual stack heights are less than the GEP formula height and therefore are appropriate. Building downwash is also appropriately accounted for in the PCS White Springs modeling.

7.3.2.5. 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 sources.

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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 PCS and one other emitter of SO_2 within 35 km in the area of analysis. The State has chosen to model these facilities using a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The facilities in the State's modeling analysis and their associated annual actual SO_2 emissions between 2012 and 2014 or PTE rates are summarized below.

For PCS the State provided annual actual SO_2 emissions between 2012 and 2014 for their two sulfuric acid plants (SAP E & F) which are the primary source of SO_2 emissions. All other sources from PCS, as well has units from the Suwannee River Plant used maximum permitted short-term emission limits. This information is summarized in Table 56. A description of how the State obtained hourly emission rates is given below this table.

Table 56. Actual SO_2 Emissions in 2014 from Facilities in Hamilton County, Florida Area

	SO_2 Emissions (tpy)		
Facility Name	**2012**	**2013**	**2014**
PCS White Springs (SAP E & F)	3,921	3,763	2,487
Total Emissions from All Modeled Facilities in the State's Area of Analysis	3,921	3,763	2,487

For PCS White Springs, the actual hourly emissions data were obtained from CEMS for SAP E & F.

The remaining units at PCS as well the Suwannee River facility were modeled at the PTE rates shown below. The hourly equivalent PTE values were converted to tpy by multiplying the permit limits by 8,760 hours per year.

Table 57. SO_2 Emissions based on PTE from Facilities in the Area of Analysis for the Hamilton County Area

Facility Name	**SO_2 Emissions (tpy)** **PTE**
PCS White Springs	11
Suwannee River Plant	1,276
Total PTE Emissions from All Modeled Facilities in the State's Area of Analysis	1,287

The Suwannee River Plant on the east side of the PCS White Springs Suwannee River/Swift Creek Complex mostly shutdown in 2014. Despite the fact that these units have not operated for over two years, Florida chose to include them in the modeling demonstration at their maximum permitted short-term emission rates given their current permitted status.

The EPA agrees with Florida's use of actual emissions for the PCS White Springs sulfuric acid plants (SAP E & F), and with the use of permit allowable (PTE) emissions remaining PCS White Springs and Suwannee River sources. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

7.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

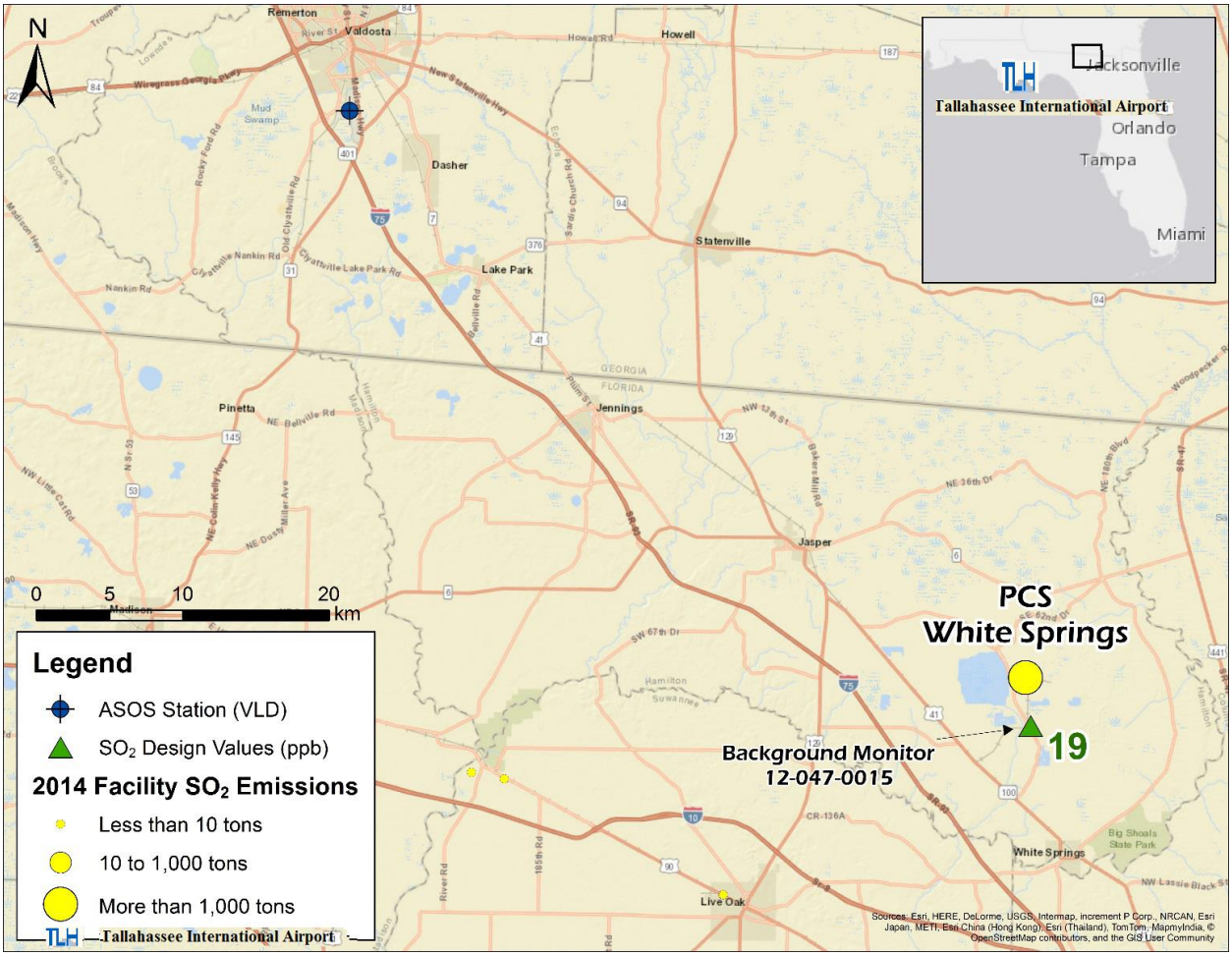
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Hamilton County, Florida, area, the State selected the surface meteorology from Valdosta Regional Airport, located approximately 53 km northwest of the PCS White Springs facility, and coincident upper air observations from Tallahassee, Florida, as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from Valdosta 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

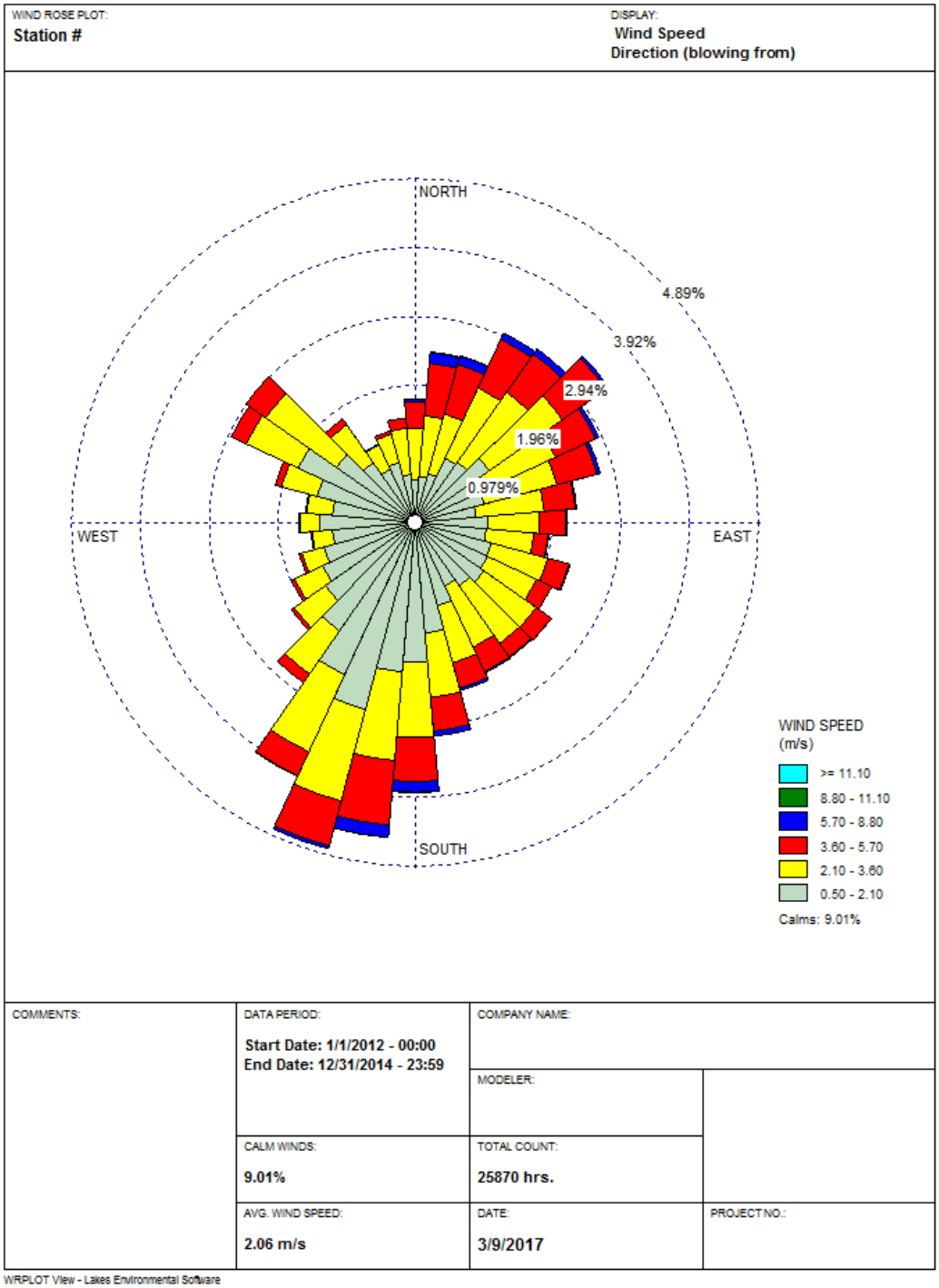
In the figure below, generated by the EPA and Florida, the location of this NWS stations is shown relative to the area of analysis.

Figure 55. Area of Analysis and the NWS stations in the Hamilton County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Valdosta Regional Airport for the 2012-14 period. In Figure 56, 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 predominantly blow from the northeast, and south-southwest directions.

Figure 56. Valdosta Regional Airport 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 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 Valdosta Regional Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Valdosta Regional Airport, located approximately 53 km northwest of the PCS White Springs facility, and coincident upper air observations from Tallahassee, Florida, as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from PCS White Springs can be expected to the northwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Valdosta Regional Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

7.3.2.7. 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. 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 1992 National Land Cover Dataset.

While Hamilton County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

7.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose to use a tier 2 approach. Data were obtained from January 2014 – December 2015 time period from the White Springs monitor (AQS Site: AQS site ID # 12-047-0015), approximately 9.0 km southeast of the PCS White Springs facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from PCS. Consequently, any measurement recorded when the wind direction was from 256° to 344° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. See Table 58 for the hourly values modeled and sorted by season.

The modeling TAD recommends using three years of concurrent monitoring data to develop the background concentrations but Florida deemed that approach inappropriate for this situation as monitoring values decreased drastically in 2014 with the shutdown of the PCS Suwannee River Plant located approximately 3 km from the monitor. As such, all available monitoring data that were not influenced by the closed plant, 2014-2015, were used to develop the background concentrations.

Table 58. 2014-2015 SO_2 Background Concentrations (ppb) by Hour-of-Day by Season for the Hamilton County DRR Modeling Demonstration. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.50	0.00	0.00	0.00	12:00	2.50	2.00	2.00	1.00
1:00	1.50	0.00	0.00	0.00	13:00	4.00	3.50	0.50	0.50
2:00	1.00	0.00	0.00	0.00	14:00	2.00	2.50	1.50	0.00
3:00	1.50	1.00	1.00	0.00	15:00	1.50	1.50	0.50	0.00
4:00	1.00	3.00	1.00	0.00	16:00	0.50	1.00	0.50	0.00
5:00	1.50	3.50	5.50	0.00	17:00	0.50	1.00	1.00	0.00
6:00	1.00	1.50	5.50	0.00	18:00	0.00	0.50	0.50	0.00
7:00	2.00	2.00	4.00	0.00	19:00	0.50	0.00	1.50	0.50
8:00	1.00	2.00	4.00	0.50	20:00	1.00	0.00	1.00	1.00
9:00	2.50	3.00	3.00	0.50	21:00	1.50	0.00	0.50	0.00
10:00	2.50	3.50	3.00	1.00	22:00	1.00	0.00	0.50	0.50
11:00	4.00	2.50	3.50	0.50	23:00	2.50	0.00	0.00	0.00

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2014-2015 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

7.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Hamilton County area of analysis are summarized below in Table 59.

Table 59. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Hamilton County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	2
Modeled Stacks	8
Modeled Structures	17
Modeled Fencelines	2
Total receptors	8164
Emissions Type	Mixed/Hybrid
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Valdosta Regional Airport
NWS Station Upper Air Meteorology	Tallahassee, Florida
NWS Station for Calculating Surface Characteristics	Valdosta Regional Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site # 12-047-0015, Tier 2 based on periods used in temporally varying approach
Calculated Background SO_2 Concentration	0 – 14.45 $\mu g/m^3$

The results presented below in Table 60 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

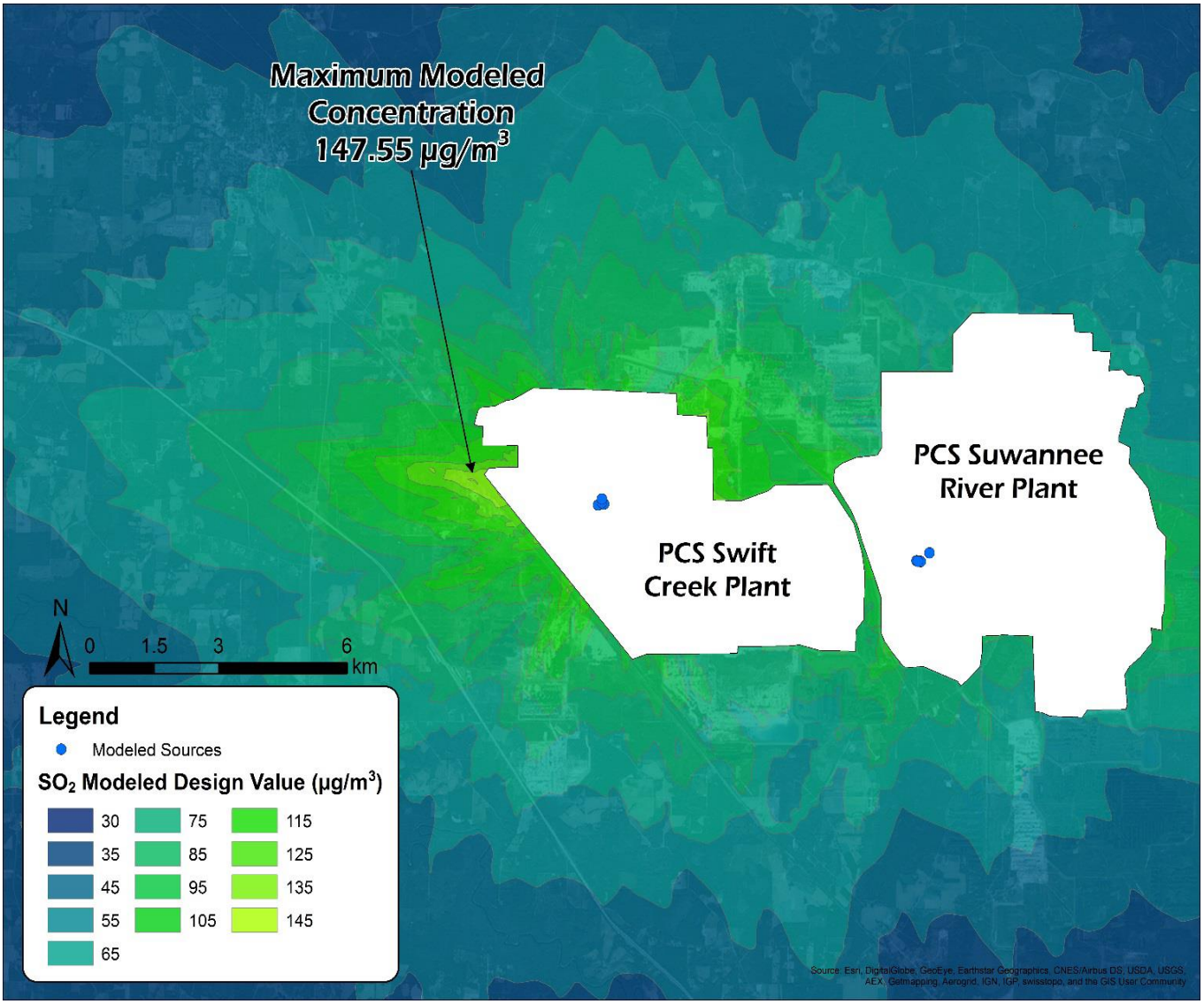
Table 60. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Hamilton County, Florida Area

		Receptor Location 17N		**99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)**	
Averaging Period	**Data Period**	**UTM/Latitude**	**UTM/Longitude**	**Modeled concentration (including background)**	**NAAQS Level**
99th Percentile 1-Hour Average	2012-2014	323,425.50	3,372,203.12	147.55	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 147.55 $\mu g/m^3$, equivalent to 56.34 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual emissions from the facility/facilities. Figure 57 below was included as part of the State's recommendation, and indicates that the predicted value occurred slightly north of west of the PCS Swift Creek Plant. The State's receptor grid is also shown in the figure.

Figure 57. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Hamilton County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Additionally, based on the available information for the remaining areas in Florida, including monitoring and modeling, there are no current SO_2 nonattainment areas near Hamilton County, Florida, and no expected nonattainment areas for this third round of designations. Therefore, the Hamilton County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

7.3.2.10 The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the PCS White Springs facility. Given the criteria for selecting nearby sources, we believe that the decision to include one additional facility (PCS Suwannee River Plant), and excluding all other sources from the modeling analysis was correct. Actual emissions for the PCS White Springs Swift Creek Plant from the 2012-14 period and permitted allowable emissions from the PCS Suwannee River Plant were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2014-2015 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the PCS White Springs facility. Additionally, the EPA believes that PCS White Springs is not contributing to any violations of the 1-hour SO_2 NAAQS.

7.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Hamilton 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.

7.5. Jurisdictional Boundaries in the Hamilton County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Hamilton County. This factor did not play a significant role in the EPA's analysis.

7.6. Other Information Relevant to the Designations for the Hamilton County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Hamilton County. The State anticipates that SO_2 concentrations in Hamilton County will continue to decrease as they have since the shutdown of the Suwannee River Plant. The facility's SO_2 emissions declined by more than 50% from 2013 to 2015 and fell below 2,000 tons in 2015. In addition, the State notified the EPA in its January 13, 2017, submission, that the facility is scheduled to implement a significant SO_2 emissions reduction project over the next three years as part of a consent decree with the EPA. Given these factors, the State is confident that the downward trend of SO_2 emissions and concentrations in Hamilton County will continue into the foreseeable future.

7.7. The EPA's Assessment of the Available Information for the Hamilton County Area

The EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the EPA believes that PCS White Springs is not contributing to any violations of the 1-hour SO_2 NAAQS.

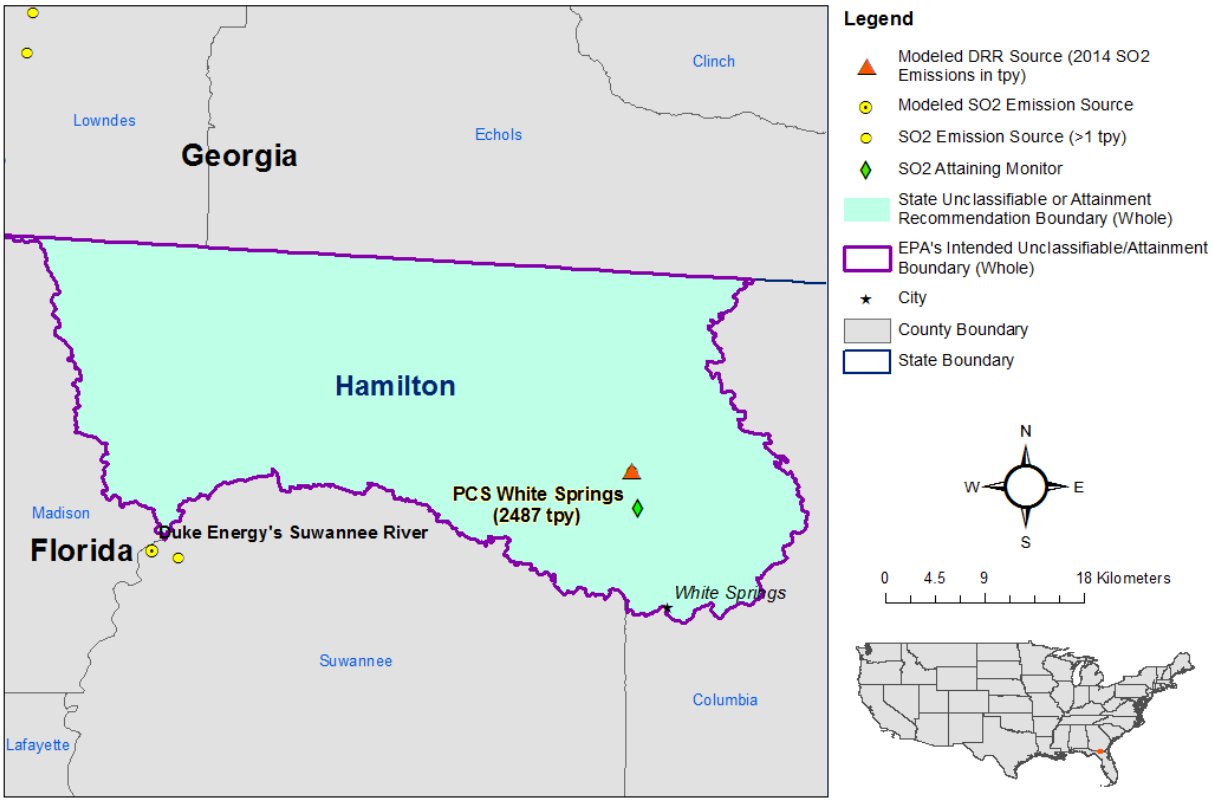
The EPA believes that our intended unclassifiable/attainment area, bounded by Hamilton County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

7.8. Summary of Our Intended Designation for the Hamilton 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 Hamilton County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of Hamilton County (in its entirety.) Although the State recommended that the area surrounding the PCS White Springs facility be designated "attainment" or "unclassifiable," the EPA's intended whole county boundary is consistent with the approach used in prior designations for counties with no monitored or modeled violation.

Figure 58 shows the boundary of this intended designated area.

Figure 58. Boundary of the Intended Hamilton County Unclassifiable/Attainment Area



8. Technical Analysis for the Hillsborough County Area

8.1. Introduction

The EPA must designate the remaining undesignated portion of Hillsborough County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Hillsborough County.

8.2. Air Quality Monitoring Data for the Hillsborough County Area Addressing Tampa Electric Company - Big Bend Station

This factor considers the SO_2 air quality monitoring data in the area of Hillsborough County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as "attainment" or "unclassifiable" for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

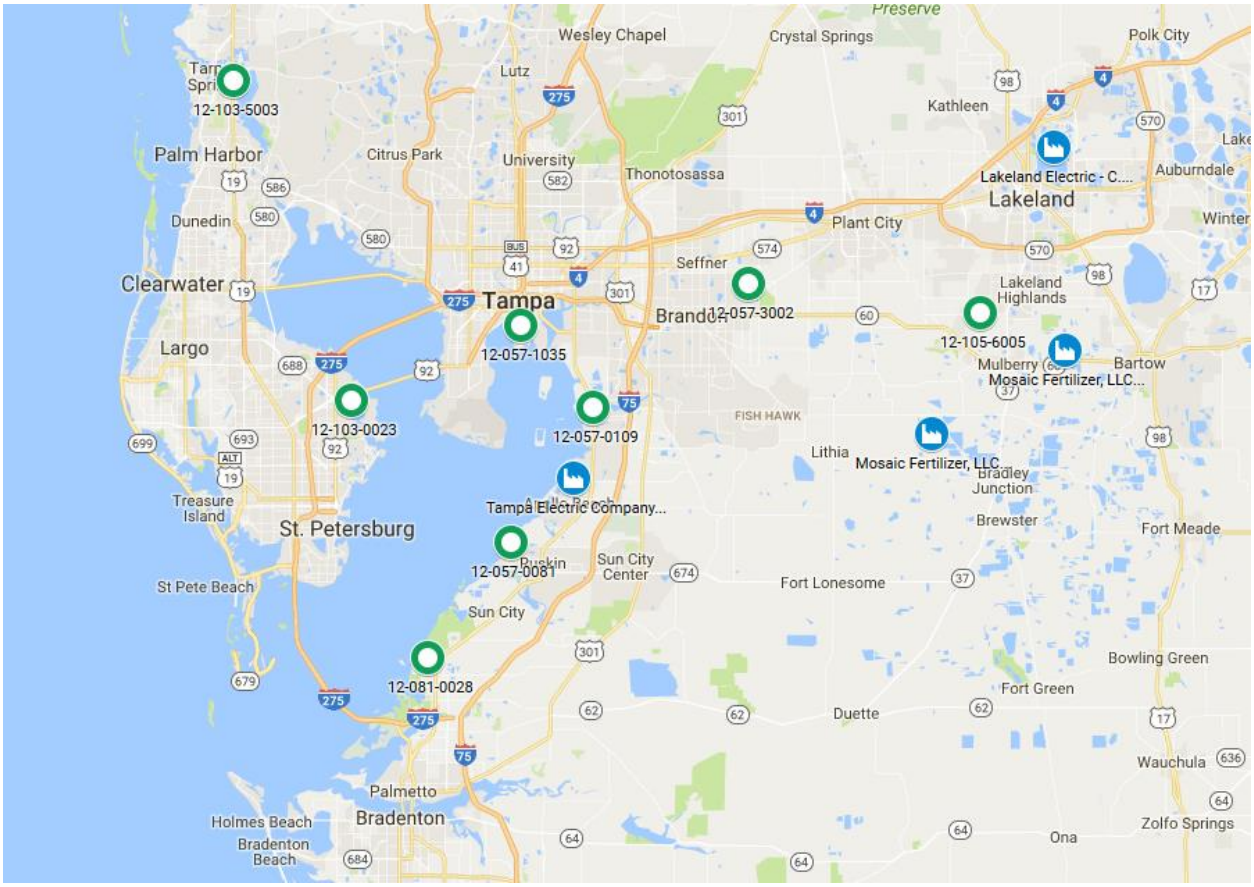
The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data summarized in the table below:

Table 61. SO_2 Monitoring Data in or Near Hillsborough County

County	AQS Monitor ID	Monitor Location	2014-2016 SO_2 Design Value (ppb)
Hillsborough	12-057-0081	27.74003, -82.46515	16
Hillsborough	12-057-0109	27.85669, -82.38348	66
Hillsborough	12-057-1035	27.92836, -82.45454	19
Hillsborough	12-057-3002	27.96565, -82.23040	13
Pinellas	12-103-0023	27.86363, -82.62315	7
Pinellas	12-103-5003	28.14167, -82.73972	4
Polk	12-105-6005	27.93975, -82.00008	23

The locations of the monitoring sites, relative to Tampa Electric Company (TECO) Big Bend Station, are shown in the map below:

Figure 59. Map of Nearby Monitors for the Hillsborough County Area



The Simmons Park (AQS ID: 12-057-0081) and East Bay (AQS ID: 12-057-0109) SO_2 monitors, the closest monitors to the source, are located 5.3 miles southwest and 4.4 miles northeast of TECO Big Bend Station, respectively. Data collected by all monitors in the table above are comparable to the NAAQS, and all indicate that the most recent monitored SO_2 levels are below the 1-hr NAAQS. The most recent three years of complete, quality-assured, certified data from these monitors (2014-2016) indicate a maximum 1-hr SO_2 design value of 66 ppb in Hillsborough County. However, none of these monitors were located to characterize the maximum 1-hr SO_2 concentrations near TECO Big Bend Station or in this remaining portion of Hillsborough County. Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below). The East Bay monitor is located near the Mosaic Fertilizer, LLC Riverview Facility, and is in a 1-hr SO_2 NAAQS nonattainment area which was designated during Round 1 of the 1-hr SO_2 NAAQS designations.

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Hillsborough County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

8.3. Air Quality Modeling Analysis for the Hillsborough County Area Addressing Tampa Electric Company

8.3.1. Introduction

This section 9.3 presents all the available air quality modeling information for a portion of Hillsborough County that includes TECO Big Bend Station. (This portion of Hillsborough County will often be referred to as "the Hillsborough County area" within this section 9.3). This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The TECO Big Bend Station and Mosaic Riverview facilities emitted 2,000 tons or more annually. Specifically, Big Bend Station emitted 11,156.71 tons of SO_2 and Mosaic Riverview emitted 2,209.13 tons of SO_2 in 2014. The Big Bend Station source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling. Mosaic Riverview is located in the existing Hillsborough Nonattainment area designated in 2013 and thus is not on the SO_2 DRR Source list.

- The Envirofocus facility does not emit 2,000 tons or more annually and is not on the SO_2 DRR Source list, but was included in the modeling assessment. In 2014 the Envirofocus facility emitted 164.96 tpy of SO_2, and is located approximately 19 km from the Big Bend Station facility.

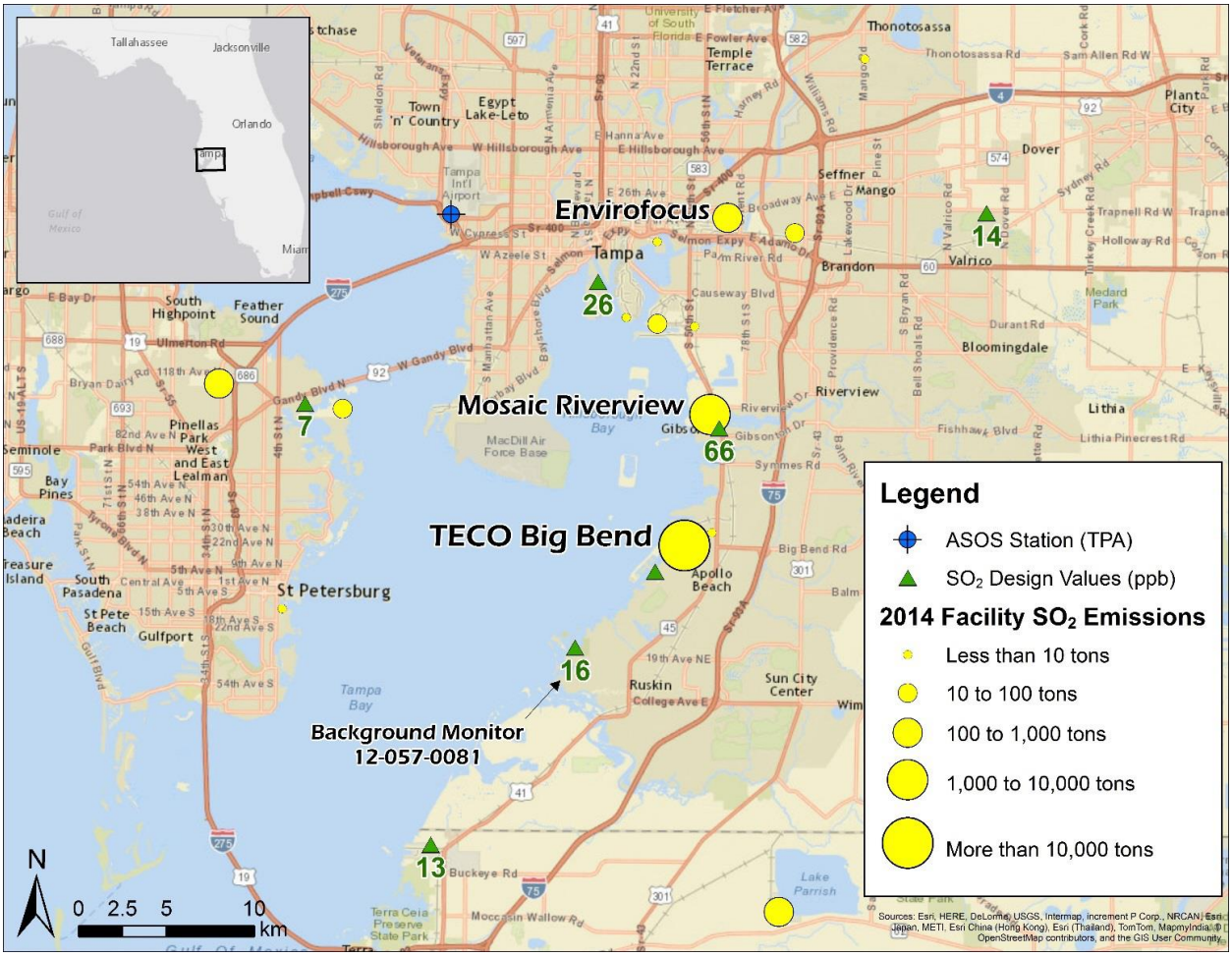
In its submission, Florida recommended that an area that includes the area surrounding the Big Bend Station , specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing permitted allowable emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA 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 the western coastal area of Tampa Bay. It should be noted that Big Bend Station lies just outside of the existing Hillsborough County SO_2 nonattainment area that was designated in Round 1 of the designations for the 2010 1-hour SO_2 NAAQS. As seen in Figure 60 below, the Big Bend Station facility is located in the Tampa area between Tampa Bay and Hillsborough Bay.

The figure also includes nearby emitters of SO_2, within 35 km of Big Bend Station.[23] The nearby emitters included in Figure 60 are: TECO Bayside Power Station (15.19 tpy in 2014), McKay Bay Refuse-to-Energy (7.06 tpy), Hillsborough County RRF (13.89 tpy), Envirofocus Technologies (164.96 tpy), Duke Energy Bartow Plant (16.29 tpy), and Pinellas County RRF (187.97 tpy). The map identifies the three facilities that were explicitly modeled by Florida, namely Big Bend Station, Mosaic Riverview, and Envirofocus. The state asserted that the remaining facilities identified above were accounted for using a representative background concentration from a nearby ambient monitoring station.

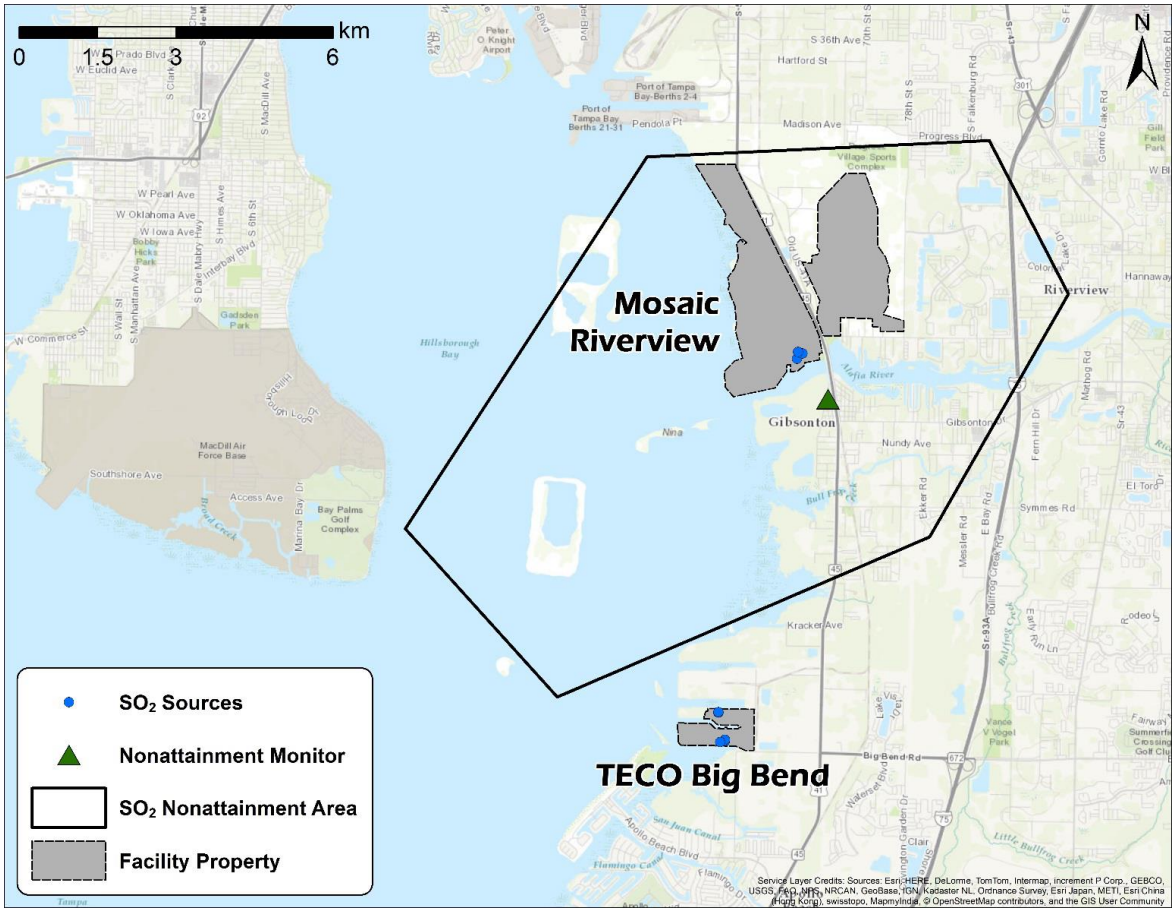
Figure 61 shows the proximity of Big Bend Station to the existing nonattainment area surrounding the Mosaic Riverview facility.

Figure 60. Map of the Hillsborough County Area Addressing Big Bend Station. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[23] All other SO_2 emitters of 10 tpy or more (based on information provided by the State of Florida) are shown in Figure 60.

Figure 61. Map Showing Big Bend Station and the Nearby Existing SO_2 Nonattainment Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two modeling assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 62. Modeling Assessments for the Hillsborough County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	01/13/2017	Hillsborough County Modeling Report	Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

8.3.2. Modeling Analysis Provided by the State

The state submitted similar modeling information in the protocol and the report. The report went into a more detailed discussion on receptor placement and meteorological data. The modeling report does not significantly change any inputs, model versions or components, and accordingly, the modeled results and conclusions presented in the report did not significantly change. The final report from the State is primarily used in this TSD, but details from the protocols may be relevant.

8.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

8.3.2.2. Modeling Parameter: Rural or Urban Dispersion

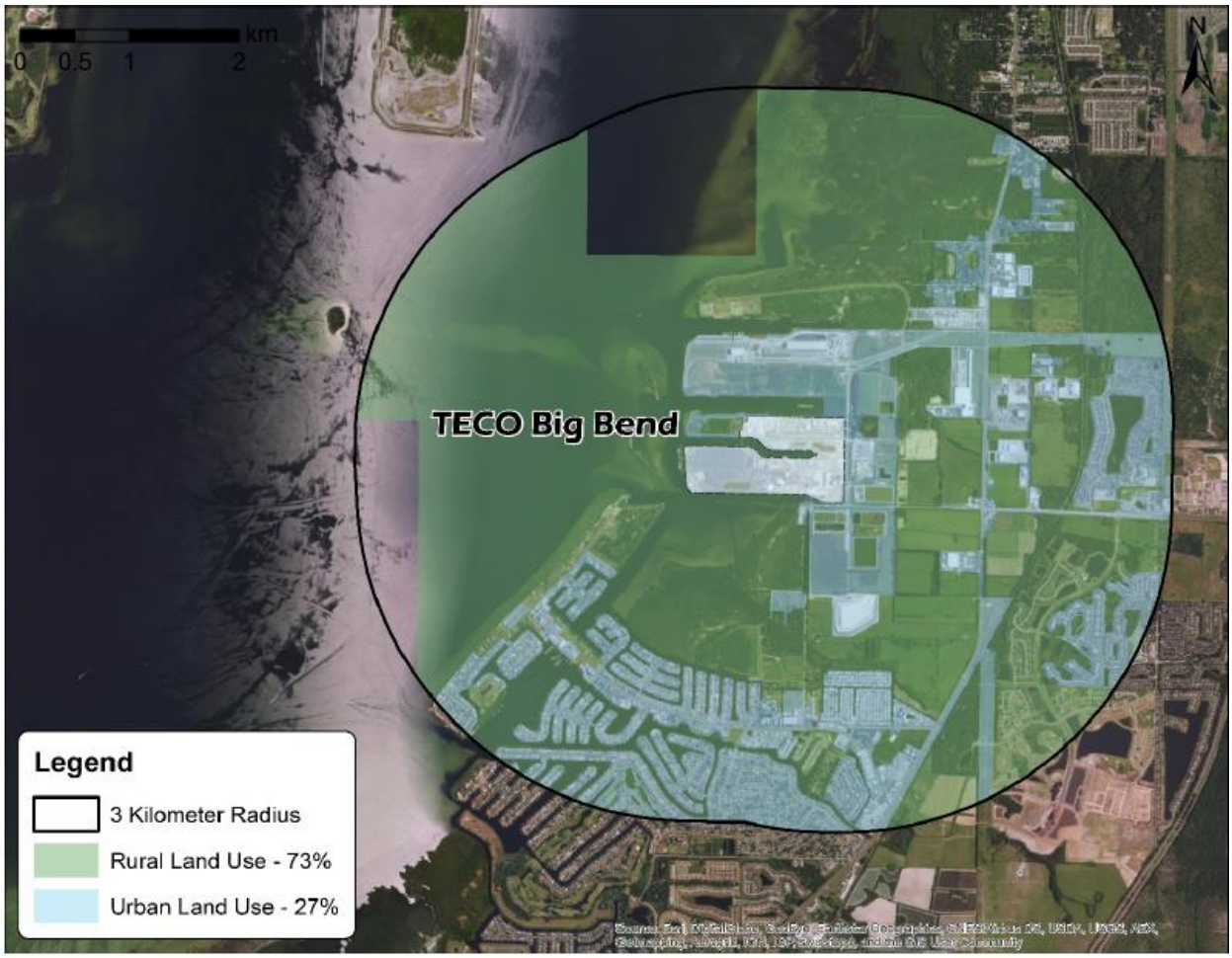
For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The state used the Auer method in determining the land use around the Big Bend Station facility. The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. The state concluded the Big Bend Station facility constitutes a majority (73 percent) rural land used as seen in Figure 62. From that analysis the rural method was utilized in AERMOD.

The EPA concurs with the State's assessment of the land use and deems it appropriate to use rural mode in AERMOD.

Figure 62. Land use for TECO Big Bend. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



8.3.2.3. 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 SO_2 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 SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Hillsborough County area, the State has included two other emitters of SO_2 within 35km of Big Bend Station in any direction. The State determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to Big Bend Station, the other emitters of SO_2 included in the modeling analysis are: Mosaic Riverview and Envirofocus.

Florida also assessed other SO_2 emissions sources in the Hillsborough County area. Table 63 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 63. SO_2 Emissions Sources within 35 km of the Big Bend Station. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from Big Bend (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
057-0039	TECO Big Bend [a]	0	0	11,156.71	Yes
057-0008	Mosaic Riverview [a]	8	160	2,209.13	Yes
057-0040	TECO Bayside Power Station	13	260	15.19	No
057-0127	McKay Bay Refuse-to-Energy	18	360	7.06	No
057-0261	Hillsborough County RRF	19	380	13.89	No
057-0057	Envirofocus Technologies [a]	19	380	164.96	No
103-0011	Duke Energy Bartow Plant	21	420	16.29	No
081-0010	FPL Manatee Power Plant	22	440	454.26	Yes
103-0117	Pinellas County RRF	28	560	187.97	No

a. Explicitly modeled facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the Big Bend Station.

No other sources beyond 35km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The grid receptor spacing for the area of analysis chosen by the State is as follows. A rectangular Cartesian receptor grid with the following spacing:

- spacing of 100 m out to a distance of 3 km from Big Bend Station,
- spacing of 250 m from that point out to a distance of 5.5 km from the source,
- spacing of 500 m from that point out to a distance of 8 km from the source,
- additionally, receptors were placed at 50 m spacing along the fenceline of the Bing Bend Station facility.

Initial modeling indicated that high concentrations were found in an area of insufficiently dense receptor placement near Mosaic Riverview. Accordingly, an additional nested grid of receptors with 100 m spacing was placed in this area to fully resolve the highest concentrations. This additional receptor grid included receptors with 100 m spacing extending 1,500 m in each direction around the Mosaic Riverview facility.

The receptor network contained 5,726 receptors, and the network covered a portion of Hillsborough County extending 8 km in each direction from the Big Bend Station.

Figures 63 and 64, included in the State's recommendation, show the State's chosen area of analysis surrounding the Big Bend 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 locations that would be considered ambient air relative to each modeled facility, including other facilities' property. The Modeling TAD describes a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The State chose not to employ this process and instead included receptors in all areas the State considered ambient air within 8 km of Big Bend. Figure 64 from the Florida Modeling Report shows the Big Bend Station fence line boundary. However, no information was provided in Florida's Modeling Report for the Hillsborough County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[24] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

[24] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 63. Area of Analysis for the Hillsborough County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

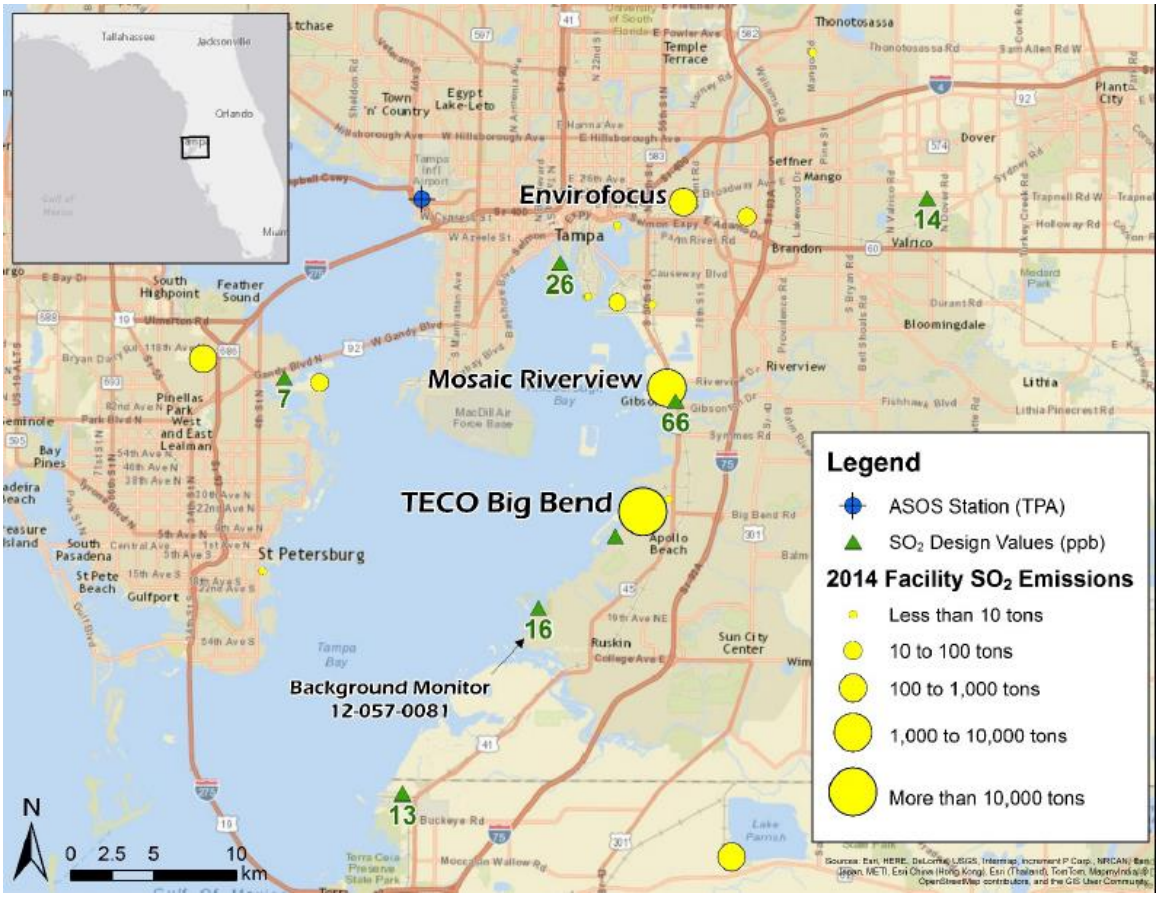
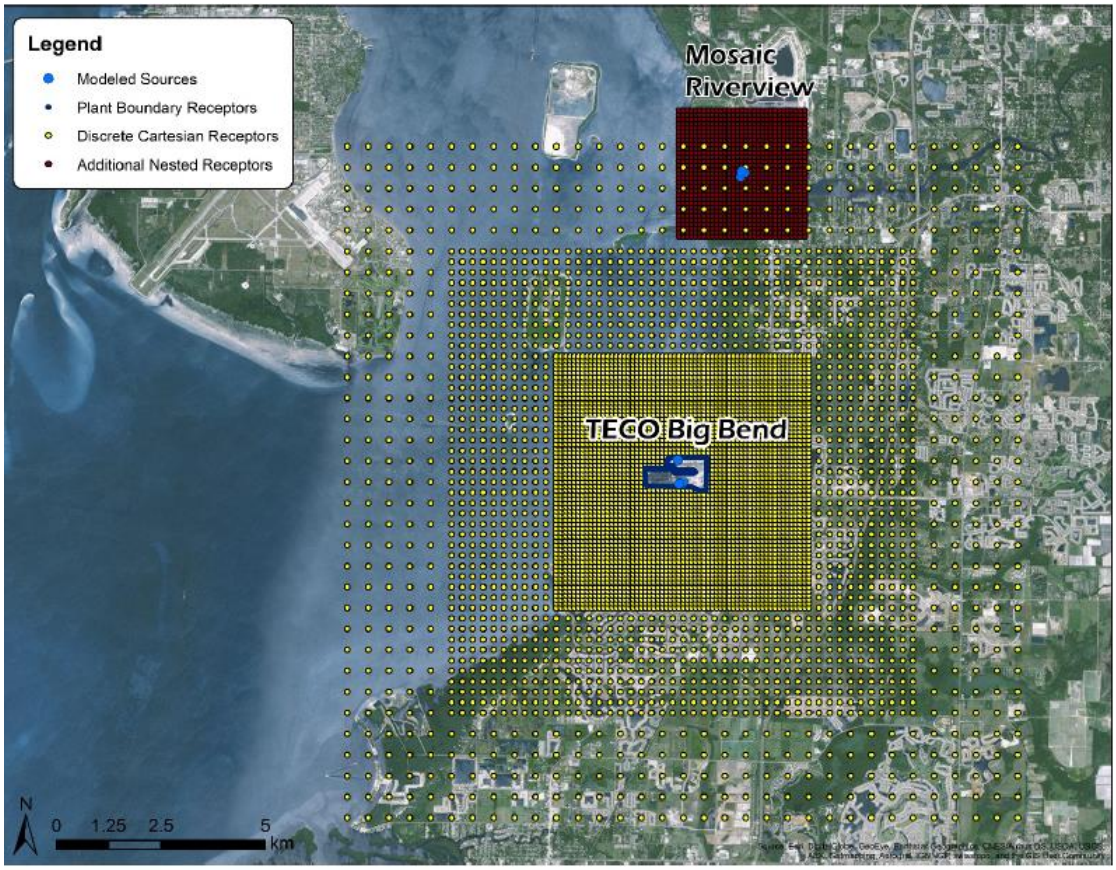


Figure 64. Receptor Grid for the Hillsborough County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



8.3.2.4. 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 State characterized these sources within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the State followed the EPA's GEP policy in conjunction with allowable emissions limits. 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees that this component of the modeling analysis was performed in a manner consistent with the SO_2 Modeling TAD. The actual stack heights were used for each of the modeled sources. Florida's Modeling Report indicates that the actual stack heights are less than or equal to the GEP formula height for each source and are therefore acceptable.

8.3.2.5. 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 Big Bend Station and two other emitters of SO_2 within 35 km in the area of analysis. The state has chosen to model these facilities using the most recent federally enforceable and effective permit allowable limits for SO_2 emissions. The facilities in the State's modeling analysis and their associated allowable rates are summarized below.

For Big Bend Station, Mosaic Riverview, and Envirofocus, the State provided permit allowable values. This information is summarized in Table 64. Additionally, Florida provided information to show that 2015 actual emissions of SO_2 at Big Bend Station were 34 percent less than in 2014. A description of how the State obtained hourly emission rates is given below this table.

Table 64. SO_2 Emissions based on PTE from Facilities in the Hillsborough Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
Big Bend Station	18,458.15
Mosaic Riverview	2,609.87
Envirofocus	2,321.88
Total Emissions from All Modeled Facilities in the Area of Analysis	23,389.90

The State provided the maximum permitted allowable emission rates in pounds per hour for each of the emissions units included in the modeling. For the permitted allowable emissions limits that have averaging times greater than a 1-hour average (e.g., 30-day average limits), Florida appropriately converted the limits to 1-hour average limits using the procedures contained in the EPA's April 23, 2014, "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions." The PTE in tons per year for each of these facilities provided in the table above was determined by the EPA by multiplying the maximum allowable hourly permitted emission rates (PTE) in pounds per hour for each unit by 8,760 hours in a year and dividing by 2000 pounds per ton. The facilities were modeled using maximum allowable emissions and corresponding stack parameters consistent with the GEP Policy. Emissions were assumed to be the same in each modeled year.

The allowable emissions for the Big Bend Station facility reflect reductions resulting from the modeling assessments done for the Attainment Demonstration State Implementation Plan (SIP) for the existing Hillsborough SO_2 nonattainment area. On February 26, 2015, Florida issued a federally enforceable air construction permit to TECO (Permit No. 0570039-074-AC) (TECO Permit). Under the TECO Permit, the facility was authorized to replace existing fuel igniters and associated equipment to allow Boiler Units 1 through 4 to burn natural gas instead of fuel oil during startup, shutdown, and flame stabilization. Under the TECO permit, the facility is also required to comply with an SO2 emissions cap of 3,162 lbs/hour based on a 30-day rolling average for all fossil-fuel-fired electrical generating units.

The allowable emissions for Mosaic Riverview were imposed by the nonattainment area plan which sets an SO_2 emissions cap of 575 lb/hr based on a 24-hour block averaging time. This cap was split among the three sulfur acid plants at the facility based on the relative production capacity of each unit. This scenario is reflective of the typical operation of the facility.

Emissions from the Envirofocus facility are primarily emitted from two stacks; the process stack and the hygiene baghouse stack. These emissions were characterized using their two-unit maximum permitted emissions cap. Florida analyzed the CEMS data for both units from 2012-2014 and found that the process stack accounts for 15 percent of the hourly emissions on average with the baghouse stack accounting for the rest. The emissions cap was distributed to these units based on that ratio.

The EPA approved Florida's Attainment Demonstration SIP for the Hillsborough County Nonattainment Area on July 3, 2017, with an effective date of August 2, 2017.[25] Details regarding the new emissions limits and how they were established are available in the Attainment Demonstration SIP documents available in the docket for this action.

The EPA concurs with this component of the modeling assessment. Allowable emissions were used in the modeling and the GEP Policy was followed.

8.3.2.6. 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.

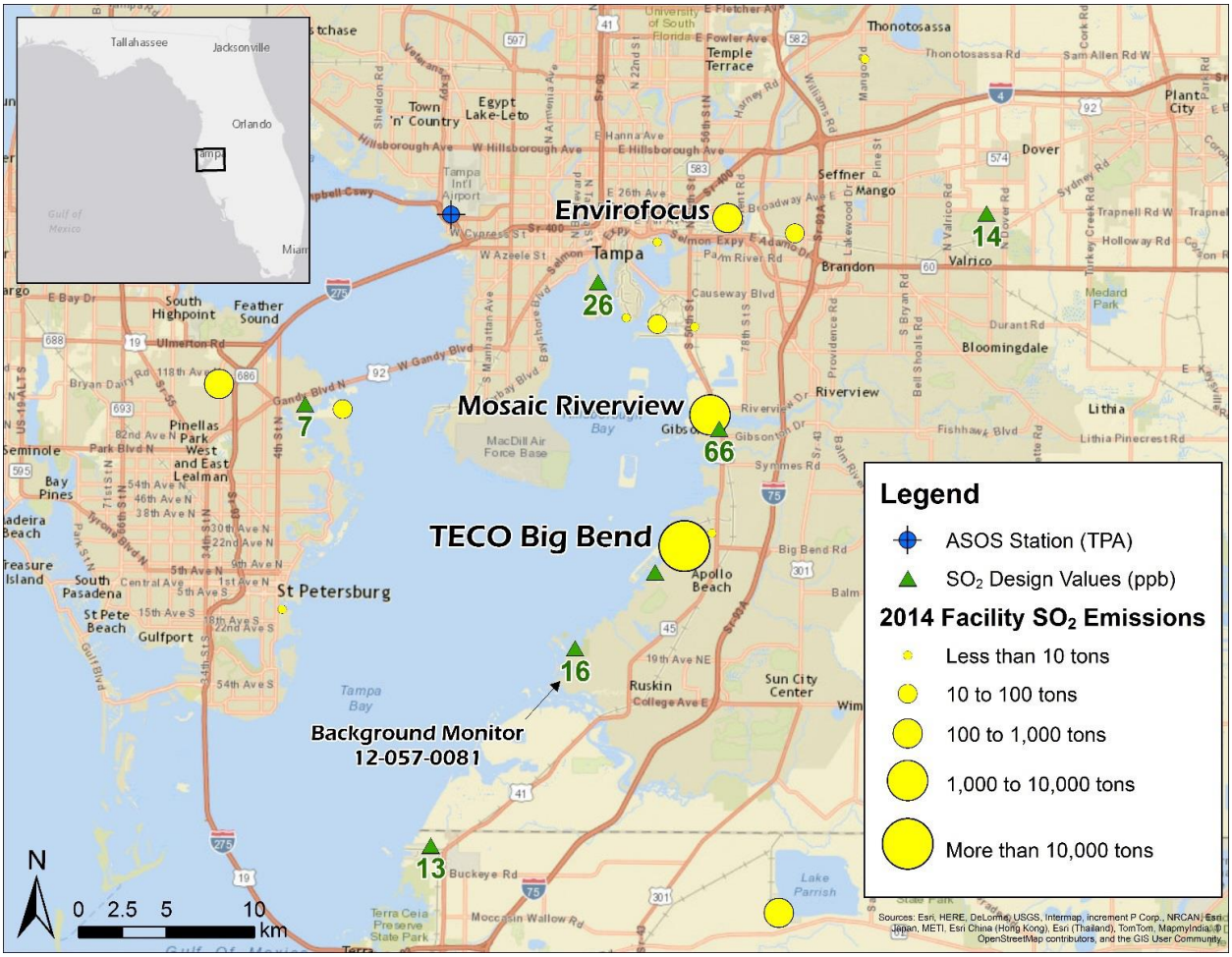
For the area of analysis for the Hillsborough area, the State selected the surface meteorology for 2012-2014 from the Tampa International Airport NWS station in Tampa, Florida, located at 27.9633 degrees N and 82.5400 W, 23 km to the northwest of Big Bend Station, and coincident upper air observations from the nearest NWS atmospheric sounding location in Ruskin, Florida, (TBW) as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from the Tampa International Airport NWS station 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for wet conditions.

In the figure below, included in the State's recommendation, the location of this NWS station is shown relative to the area of analysis.

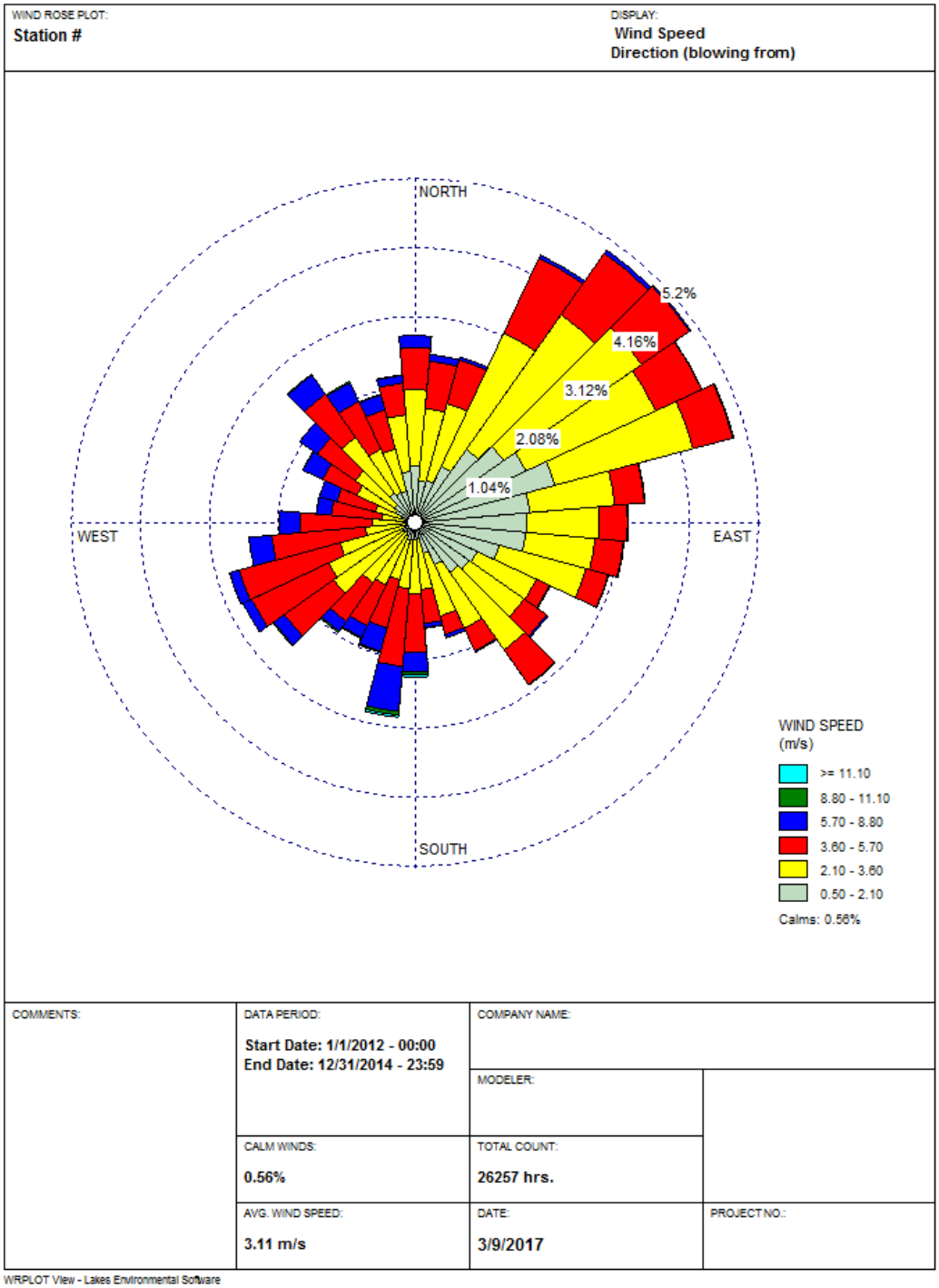
[25] 82 FR 30749 (July 3, 2017).

Figure 65. Area of Analysis and the NWS station in the Hillsborough County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Tampa Airport for the 2012-14 period. In Figure 66, 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 predominately blow from the northeast directions.

Figure 66. Tampa Airport 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 AERMOD Implementation Guide 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 Tampa International Airport NWS station, 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 m/s 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 the surface and upper air meteorological data selected by the State for use in this analysis. Also, the data were processed in a manner consistent with the AERMOD Implementation Guidance. The EPA believes that the wind rose indicates that impacts from Big Bend Station are reasonably expected to most frequently occur generally southwest of the facility, but that impacts could be seen in other directions as well.

8.3.2.7. 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. To account for any minor 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) NED.

While Hillsborough County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

8.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Simmons monitor (AQS Site: AQS site ID # 12-057-0081), approximately 8.5 km southwest of the Big Bend Station facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from Big Bend Station, Mosaic Riverview, or Envirofocus. In this case, any measurement recorded when the wind direction was from 344° to 90° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword.

The background concentrations for this area of analysis were determined by the State to vary from 1.00 μg/m^3, equivalent to 2.62 ppb when expressed in 3 significant figures,[26] to 6.67 μg/m^3 (2.55 ppb). Table 65 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 65. Tier 2 Temporally Varying Background Concentrations from the Simmons monitor (AQS Site: AQS site ID # 12-057-0081.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	1.33	1.33	1.00	2.33	12:00	3.67	2.67	3.33	3.67
1:00	1.33	1.00	0.67	1.33	13:00	4.33	3.00	3.67	3.33
2:00	1.00	0.67	1.00	1.67	14:00	2.67	2.00	2.67	3.00
3:00	2.33	0.67	1.00	1.00	15:00	2.00	1.33	1.67	2.33
4:00	1.00	0.33	1.00	1.33	16:00	2.67	1.33	1.67	2.33
5:00	1.00	0.33	1.00	1.33	17:00	2.00	1.33	1.33	1.67
6:00	1.33	0.67	2.00	1.67	18:00	2.00	1.00	1.00	1.67
7:00	1.33	1.67	2.00	2.00	19:00	2.00	1.00	0.67	1.33
8:00	2.00	2.67	2.00	4.33	20:00	3.00	1.00	1.33	2.33
9:00	4.33	1.33	2.67	4.00	21:00	2.00	1.67	1.33	2.00
10:00	4.00	1.33	2.00	3.67	22:00	2.00	6.67	7.00	2.00
11:00	2.67	2.00	1.33	3.67	23:00	1.67	2.00	1.33	2.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period.

[26] The SO_2 NAAQS level is expressed in ppb but AERMOD gives results in μg/m^3. The conversion factor for SO_2 (at the standard conditions applied in the ambient SO_2 reference method) is 1ppb = approximately 2.619 μg/m^3.

The EPA believes that the chosen background monitored concentration is representative of the area.

8.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Hillsborough County area of analysis are summarized below in Table 66.

Table 66. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Hillsborough County Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	11
Modeled Stacks	
Modeled Structures	51
Modeled Fencelines	1
Total receptors	5,726
Emissions Type	Permit Allowables (PTE)
Emissions Years	2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Tampa International Airport NWS Station
NWS Station Upper Air Meteorology	NWS Sounding location in Ruskin, Florida
NWS Station for Calculating Surface Characteristics	Tampa International Airport NWS Station
Methodology for Calculating Background SO_2 Concentration	AQS Site #12-057-0081, Tier 2 2012-2014 temporally varying
Calculated Background SO_2 Concentration	Temporally varying

The results presented below in Table 67 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

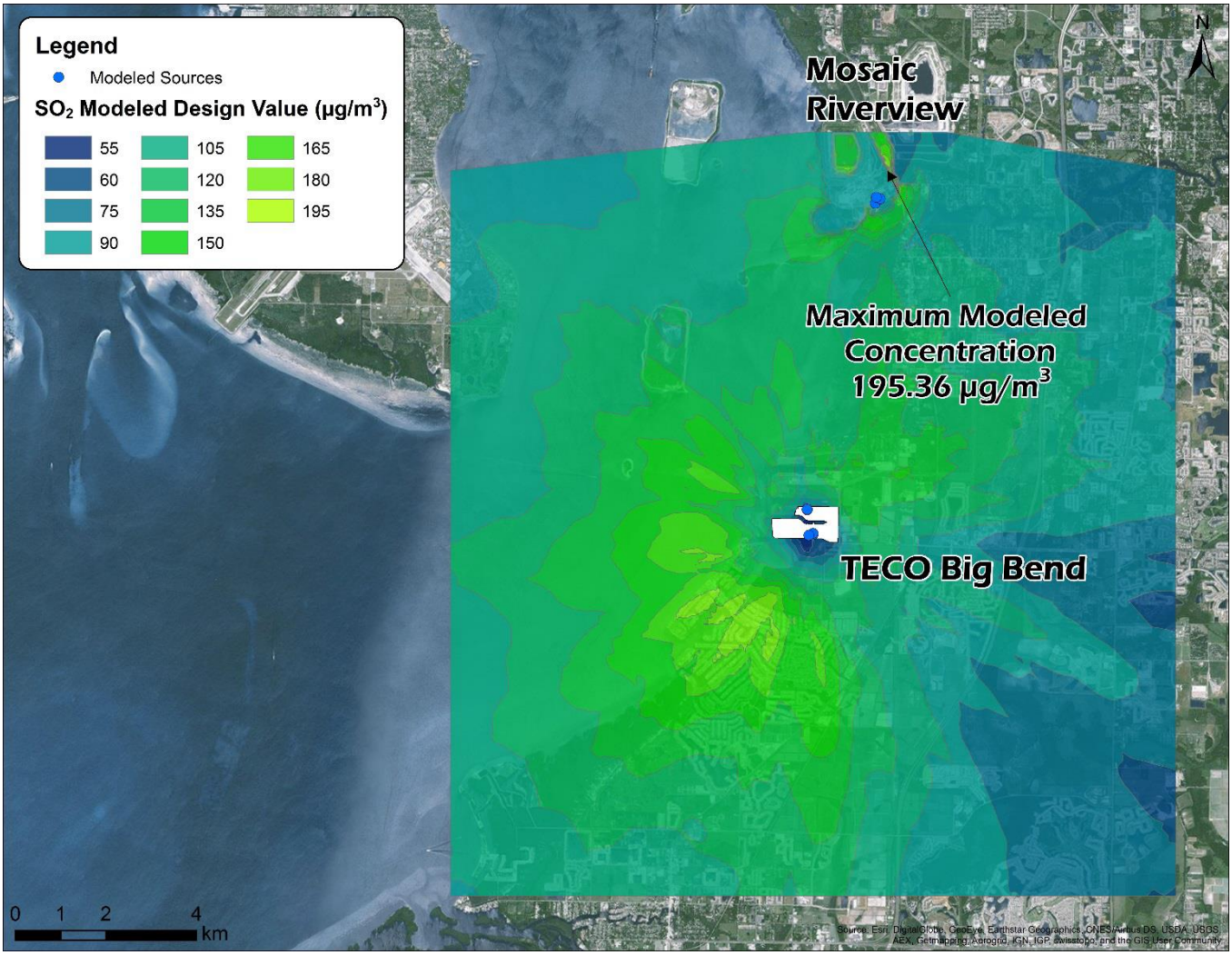
Table 67. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Hillsborough County Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	363,400 E	3,083,400 N	195.36	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 195.36 µg/m^3, equivalent to 74.59 ppb. This modeled concentration included the background concentration of SO_2, and is based on permitted allowable emissions from the Big Bend Station, Mosaic Riverview, and Envirofocus facilities. Figure 67 below was included as part of the State's recommendation, and indicates that the predicted value occurred to the northeast of the Mosaic Riverview facility.

Figure 67. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Hillsborough Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration.

The State's modeling report for the Hillsborough County area does not directly address whether emissions from the TECO Big Bend facility has the potential to contribute to violations in the existing Hillsborough County nonattainment area located approximately 2 km from Big Bend Station. However, the modeling receptor grid used in the analysis fully encompasses the existing nonattainment area. No modeled violations of the 1-hour SO_2 NAAQS were found inside (or outside) the existing nonattainment area. Additionally, the monitor located within the nonattainment are is currently attaining the NAAQS with a 2014-2016 design value of 66 ppb.

The allowable emissions for the Big Bend Station facility reflect reductions resulting from the modeling assessments done for the Attainment Demonstration State Implementation Plan (SIP) for the existing Hillsborough SO_2 nonattainment area. On February 26, 2015, Florida issued a federally enforceable air construction permit to TECO (Permit No. 0570039-074-AC) (TECO Permit). Under the TECO Permit, the facility was authorized to replace existing fuel igniters and associated equipment to allow Boiler Units 1 through 4 to burn natural gas instead of fuel oil during startup, shutdown, and flame stabilization. Under the TECO permit, the facility is also required to comply with an SO_2 emissions cap of 3,162 lbs/hour based on a 30-day rolling average for all fossil-fuel-fired electrical generating units. The EPA approved Florida's Attainment Demonstration SIP for the Hillsborough County Nonattainment Area on July 3, 2017, with an effective date of August 2, 2017.[27] The Attainment Demonstration contains modeling which demonstrates that the area will be attaining the NAAQS with the new allowable limits for the Big Bend Station facility. Details regarding the new emissions limits and how they were established are available in the Attainment Demonstration SIP documents available in the docket for this action. The potential for the emissions from the TECO Big Bend Station contributing to violations in the existing Hillsborough nonattainment area was fully evaluated in the Attainment Demonstration SIP.

[27] 82 FR 30749 (July 3, 2017).

8.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA concurs that the modeling for the Hillsborough area has been performed in a manner consistent with the SO_2 Modeling TAD. The EPA concurs with inclusion of only the Big Bend Station, Mosaic Riverview, and Envirofocus facilities in the modeling and with the background monitor and concentration used. The other SO_2 emissions sources in the area have small amounts of emissions and/or are located large distances from the Big Bend Station DRR Source. The modeling domain used is sufficient to resolve maximum concentrations in both the existing nonattainment area and the undesignated portion of the Hillsborough County area. The State's selection of surface and upper air meteorological stations and surface characteristics for the area are also appropriate to make a valid modeling demonstration. The state adequately represented the topography of the area with the model and its preprocessors. The modeling used permitted allowable emissions for Big Bend Station that are federally enforceable and effective and predicted no violations of the 1-hour SO_2 NAAQS both inside and outside the existing Hillsborough nonattainment area. The EPA concurs with this determination. Additionally, the combination of Florida's modeling report and the modeling done for the existing Hillsborough Nonattainment Area Attainment Demonstration show that Big Bend Station is not contributing to any violations of the1-hour SO_2 NAAQS.

8.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Hillsborough 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.

8.5. Jurisdictional Boundaries in the Hillsborough County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Hillsborough County. This factor did not play a significant role in the EPA's analysis.

8.6. Other Information Relevant to the Designations for the Hillsborough County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Hillsborough County. The State expects that the ambient concentrations and emissions of SO_2 in Hillsborough County will continue to fall as they have for at least the past decade. 2015 emissions of SO_2 at Big Bend were 34% less than in 2014 and 21% less at Mosaic Riverview. The emissions cap that Big Bend began complying with in June 2016 represents a 52% decrease in the allowable emission rates for these units. It is anticipated that the continued implementation of the Hillsborough County nonattainment area's SO_2 attainment plan through 2017 will result in even further reductions of these lower levels of SO_2 concentrations, ensuring continued compliance with the NAAQS.

8.7. The EPA's Assessment of the Available Information for the Hillsborough County Area

The EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the combination of Florida's modeling report and the modeling done for the existing Hillsborough Nonattainment Area Attainment Demonstration show that Big Bend Station is not contributing to any violations of the1-hour SO_2 NAAQS.

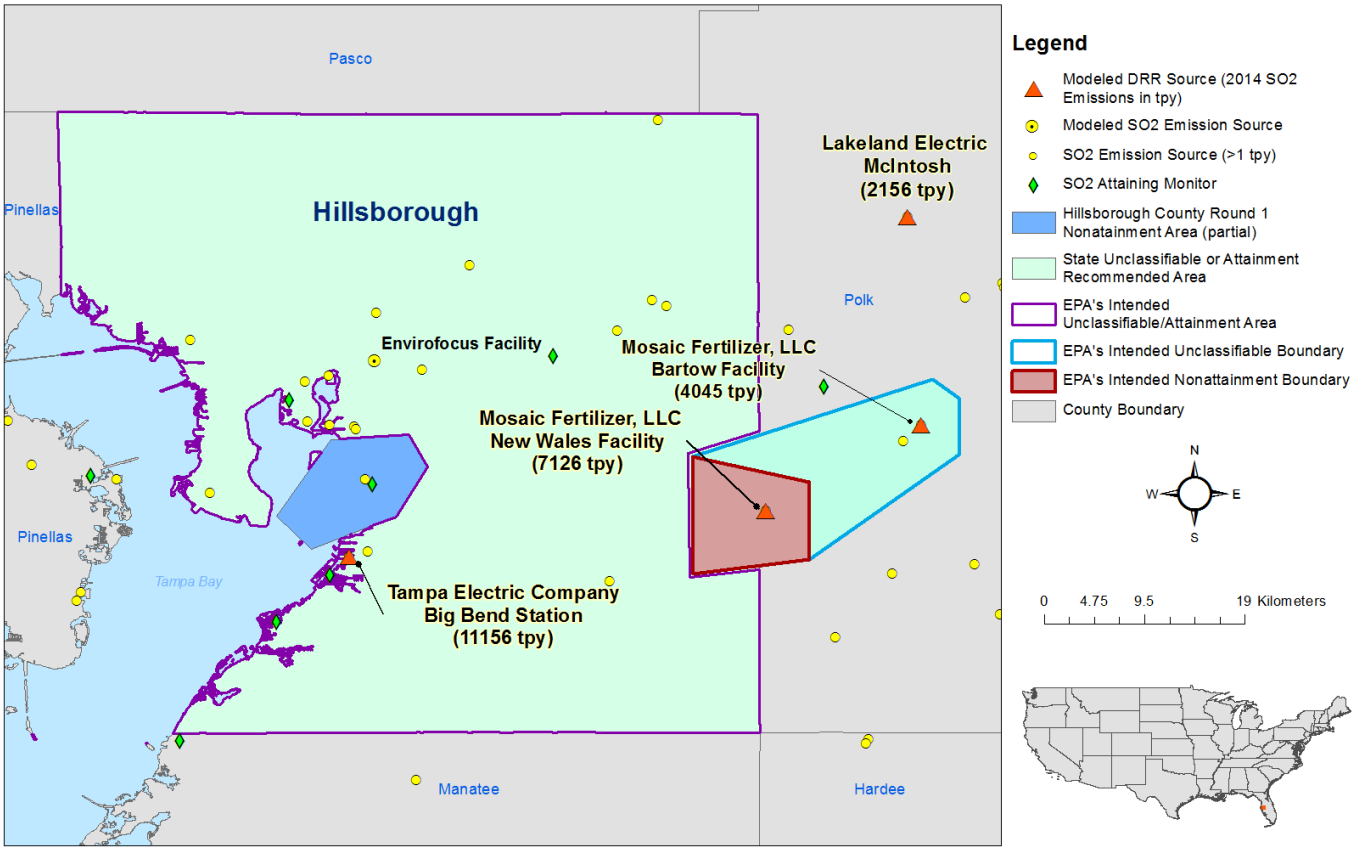
The EPA believes that our intended unclassifiable/attainment area, bounded by Hillsborough County (with the exception of that portion already designated,) will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

8.8. Summary of Our Intended Designation for the Hillsborough 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 a portion of the Hillsborough County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of the portions of Hillsborough County that are not designated nonattainment in association or unclassifiable with other sources. Although the State recommended that the area surrounding the TECO Big Bend facility be designated "attainment" or "unclassifiable," the EPA's intended partial county boundary is consistent with the approach used in prior designations for areas with no monitored or modeled violation.

Figure 68 shows the boundary of this intended designated area.

Figure 68. Boundary of the Intended Hillsborough County Unclassifiable/Attainment Area



9. Technical Analysis for the Nassau County Area

9.1. Introduction

The EPA must designate the remaining undesignated portion of Nassau County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Nassau County.

9.2. Air Quality Monitoring Data for the Nassau County Area

This factor considers the SO_2 air quality monitoring data in the area of Nassau County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data:

- The Fernandina Beach SO_2 monitor (AQS ID: 12-089-0005) is located at 30.658552, -81.463168 in Nassau County. The monitor is located in Fernandina Beach, Florida, 1.6 miles southwest of WestRock CP, LLC. Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent monitored SO_2 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 SO_2 design value of 51 ppb. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations near WestRock CP, LLC, or this area and so it cannot be used to designate the area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below). This monitor is also located near the Rayonier Fernandina Plant, and is located in a SO_2 nonattainment area that was previously designated during Round 1 of the 1-hr SO_2 NAAQS designations.

There are also four other SO_2 monitors located in Jacksonville, southwest of Nassau County. These monitors are discussed in detail in the section titled "Air Quality Monitoring Data for the Duval County Area," and are all below the 1-hr NAAQS based on the most recent three years of data but are not located to characterize the maximum 1-hr SO_2 concentrations near WestRock CP, LLC, or this area. In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Nassau County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

9.3. Air Quality Modeling Analysis for the Nassau County Area Addressing WestRock CP, LLC

9.3.1. Introduction

This section 8.3 presents all the available air quality modeling information for a portion of Nassau County that includes WestRock CP, LLC (Westrock). (This portion of Nassau County will often be referred to as "the Nassau County area" within this section 8.3.) This area contains the following SO_2 DRR sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The WestRock facility emitted 2,000 tons or more annually. Specifically, the WestRock facility emitted 3,477.17 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

- The Rayonier facility does not emit 2,000 tons or more annually and is not on the SO_2 DRR Source list, but was included in the modeling assessment. Rayonier emitted 355 tons of SO_2 in 2014, but is located only 3 km from Westrock, so Florida appropriately decided to explicitly model this facility.

In its submission, Florida recommended that an area that includes the area surrounding the WestRock, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. 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 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.

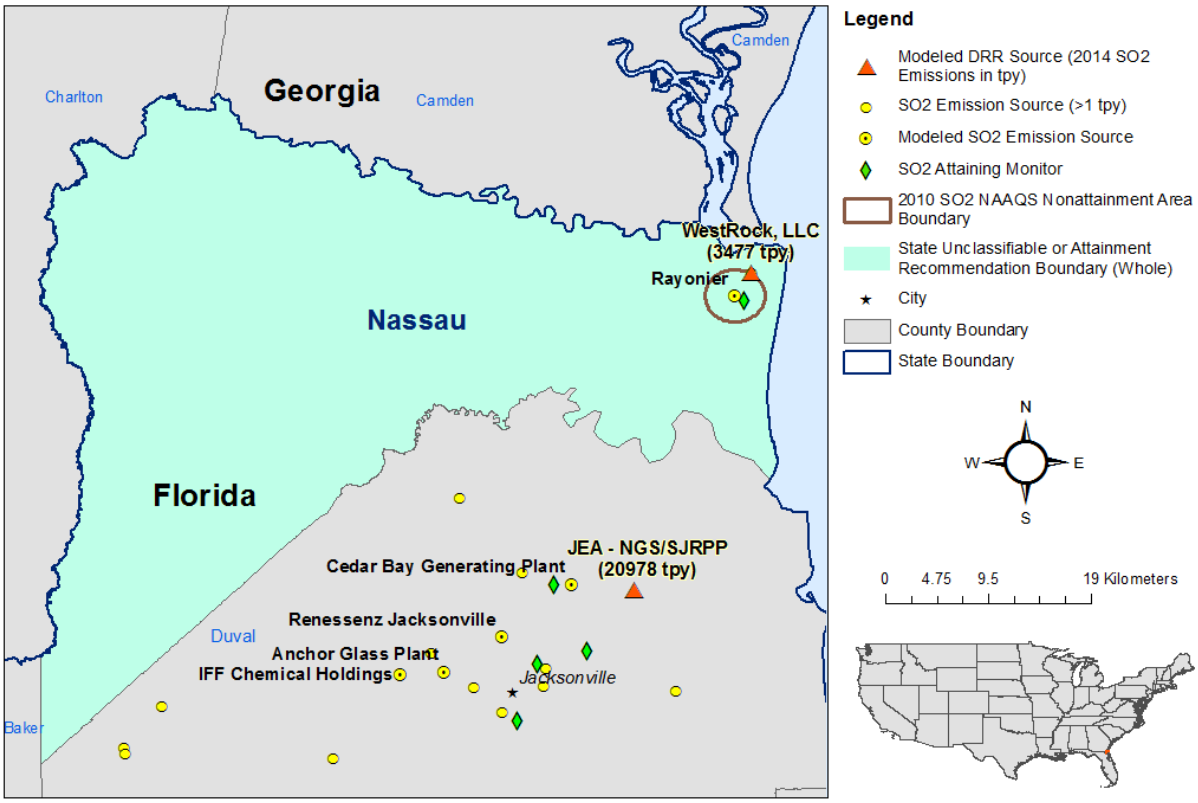
The area that the State has assessed via air quality modeling is located in the northeastern coastal area of Florida.

As seen in Figure 69 below, the WestRock facility is located in the eastern coastal area of Florida. The facility is near the Ferdinando Beach area. Also Rayonier, JEA NGS/SJRPP, Cedar Bay Generating Plant, and Anheuser-Busch Jacksonville are all located on the coastal area of Florida in Jacksonville.

Also included in the figure are other nearby emitters of SO_2.[28] These are Rayonier, JEA NGS/SJRPP, and Cedar Bay Generating Plant. All of these sources are located on the eastern coast of Florida in the Jacksonville area.

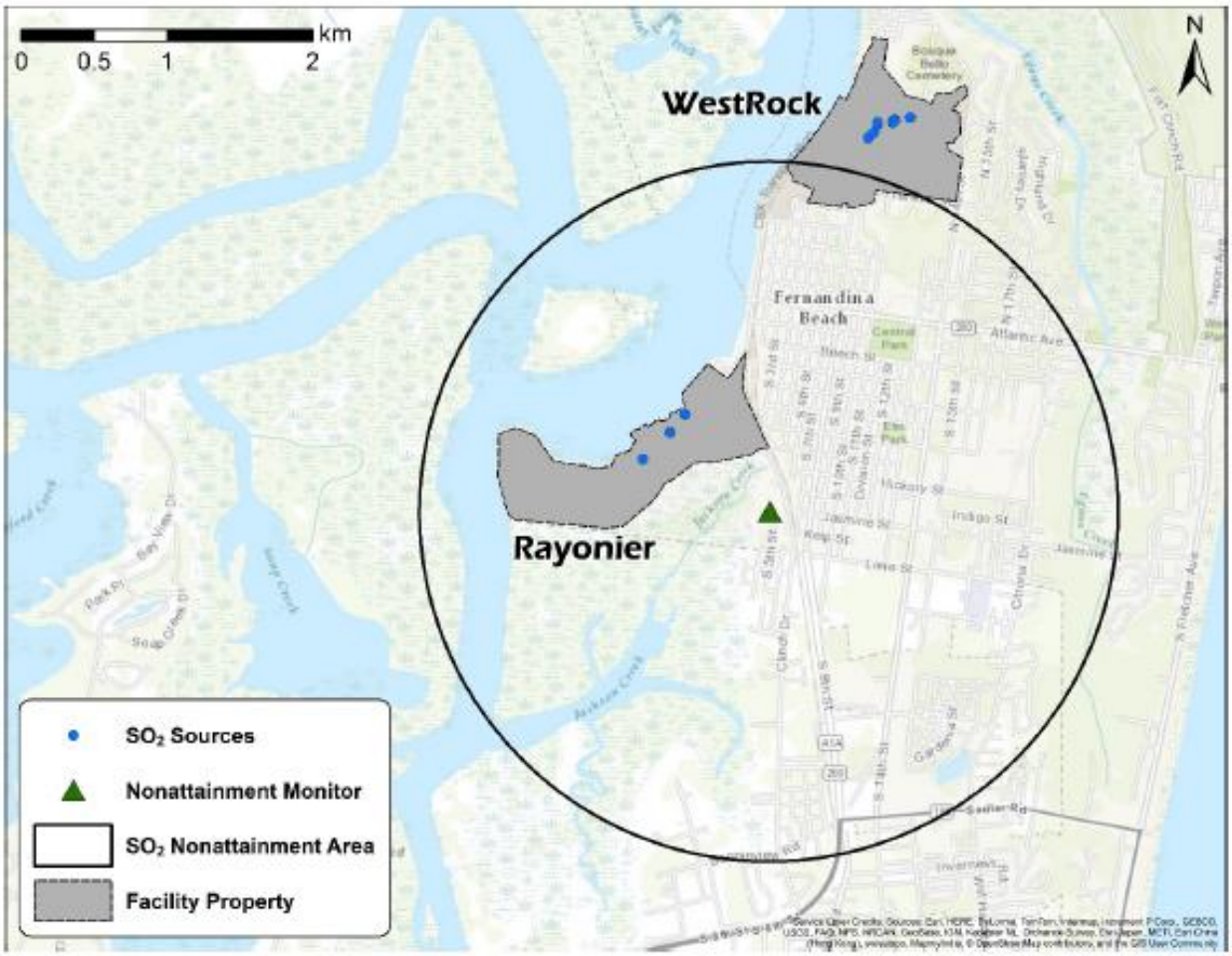
Figure 70 shows the proximity of Big Bend Station to the existing nonattainment area surrounding the Mosaic Riverview facility.

Figure 69. Map of the Nassau County Area Addressing Westrock



[28] All other SO_2 emitters of 1 tpy or more (based on information provided by the State of Florida are shown in Figure 69. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

Figure 70. Map Showing WestRock and the Nearby Existing SO_2 Nonattainment Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



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 two modeling assessments, including two assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 68. Modeling Assessments for the Nassau County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida DEP	01/13/2017	Nassau County Modeling Report	Report
Florida DEP	06/30/2016	Florida Modeling Protocol	Protocol

9.3.2. Modeling Analysis Provided by the State

9.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

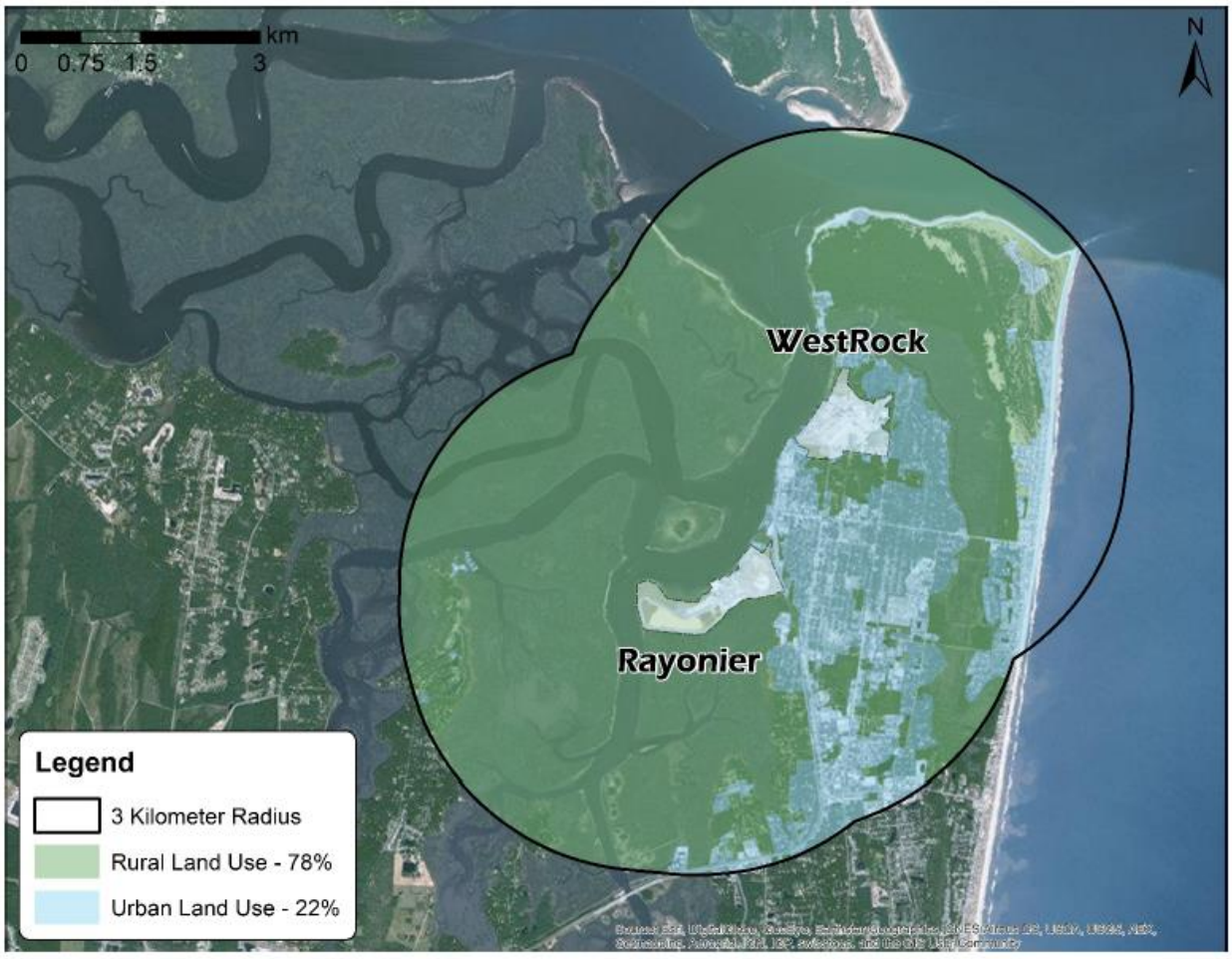
9.3.2.2. Modeling Parameter: Rural or Urban Dispersion

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 SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

Florida used the Auer method that requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model; otherwise, rural dispersion coefficients are used. It was found that WestRock had a rural land use that constitutes a majority (78 percent of the 3-km radius around the facility. Figure 71 depicts the land use representation of the Auer method.

Figure 71. Land use for the Westrock Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA agrees with the rural land use conclusion and finds it appropriately used for this area.

9.3.2.3. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Nassau County area, the State has included one other emitter of SO_2 within 35 km of WestRock in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to WestRock, the other emitter of SO_2 included in the area of analysis was Rayonier. Florida also assessed other SO_2 emissions sources in the Nassau County area. Table 69 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 69. SO_2 Emissions Sources within 35 km of the Westrock Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from WestRock (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
089-0003	WestRock [a]	0	0	3,477.17	Yes
089-0004	Rayonier [a]	3	60	354.82	Yes
031-0045	JEA NGS/SJRPP	30	600	20,978.32	Yes
031-0337	Cedar Bay Generating Plant	32	640	732.82	Yes
031-0006	Anheuser-Busch Jacksonville	33	660	8.76	No

a. Explicitly modeled facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and are located large distances from the Westrock facility.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The grid receptor spacing for the area of analysis chosen by the State is as follows:
According to the EPA's March 2011 Memo *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard*, but modified in the Modeling TAD, it is expected that the distance from the source to the area of the maximum ground-level 1-hour impact of SO_2 will be approximately 10 times the source release height. Based on this guidance, the State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals.

Receptors located within WestRock's fenceline were removed and receptors were placed with 50 m spacing along the fenceline. This grid placement was sufficient to fully resolve the maximum modeled concentrations in the Nassau County modeling demonstration.

The receptor network contained 5,718 receptors around the facility on the eastern coastline of Florida.

Figures 72 and 73, included in the State's recommendation, show the State's chosen area of analysis surrounding WestRock, 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 locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The Florida Department chose not to employ this process and instead included receptors in all areas the State considered ambient air within 8 km of WestRock. The state also did not place receptors in other locations that it considered to not be ambient air relative to each modeled facility. Figure 73 from the Florida Modeling Report shows the Westrock fence line boundary. However, no information was provided in Florida's Modeling Report for the Nassau County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[29] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

[29] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 72. Area of Analysis for the Nassau County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

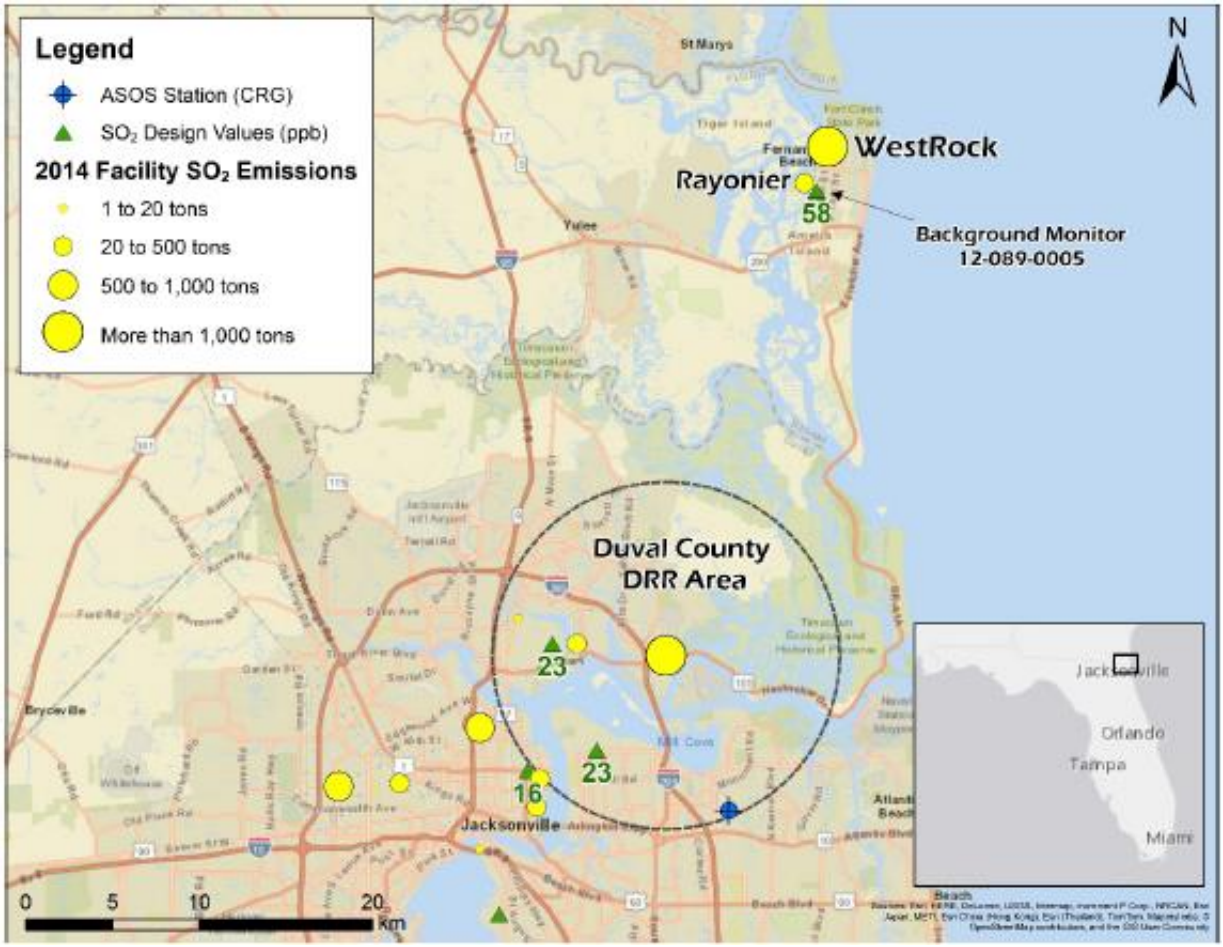
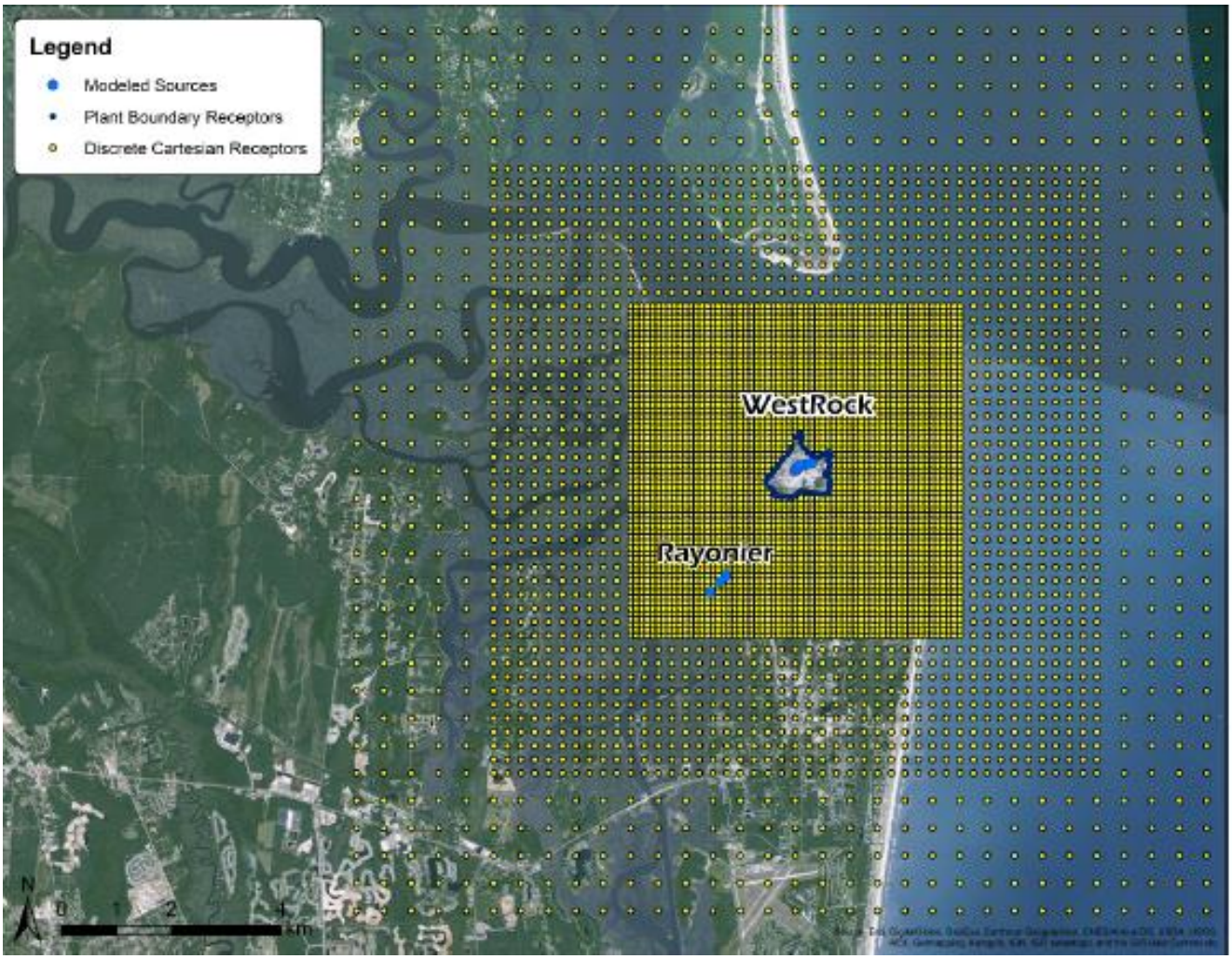


Figure 73. Receptor Grid for the Nassau County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



9.3.2.4. 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.

Florida evaluated local sources that currently emit SO_2 within 35 km of the WestRock facility. There were two sources (JEA NGS/SJRPP and Cedar Bay Generating Plant) that were shown to have Q/d contributions but were not included in this modeling by the state. The state determined that Rayonier, located approximately 3 km to the southwest, is the only other source above 100 tpy of SO_2 emissions within 30 km and the only source that has the potential to cause a significant concentration gradient in the area of interest. While the JEA Northside/St. Johns River Power Park and Cedar Bay facilities, both more than 30 km to the south, are technically

above the 20d threshold, they were not explicitly included in the modeling demonstration. The State's reasoning for this decision is based on the fact that these facilities were included in the DRR modeling demonstration for Duval County with JEA being the primary facility in the demonstration and that they are not expected to cause a significant concentration gradient in the area near the Westrock facility. Based upon their distance from the Westrock facility, the EPA agrees with Florida that they are not expected to cause a significant concentration gradient in the area near Westrock, so Florida decision not to include them in the modeling is acceptable.

The state characterized theWestrock and Rayonier sources within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the State used actual emissions with actual stack heights to characterize the primary emissions sources at the WestRock and Rayonier facilities. The State's purpose is to replicate actual ambient concentrations of SO_2. As such, the use of actual stack heights for those stacks that exceed their calculated GEP height is permitted if the source is characterized using actual hourly emissions data. The stack heights for all units at WestRock and Rayonier are less than or equal to the GEP height. 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees with Florida's method for characterizing the WestRock facility area. The assessment of nearby sources within 35 km of the facility justifies the explicit modeling the Rayonier facility exclusively along with WestRock. The use of actual stack heights is appropriate given the actual emissions used in the modeling. Building downwash is also appropriately accounted for using BPIPPRM.

9.3.2.5. 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 WestRock and one other emitter of SO_2 within 35 km in the area of analysis. The State has chosen to model these facilities using a hybrid approach, where emissions from certain facilities are expressed as actual emissions, and those from other facilities are expressed as PTE rates. The facilities in the State's modeling analysis and their associated annual actual SO_2 emissions between 2012 and 2014 or PTE rates are summarized below.

For WestRock and Rayonier facilities, the State provided annual actual SO_2 emissions between 2012 and 2014. This information is summarized in Table 70. Additionally, Florida provided information to show that 2015 actual emissions of SO_2 at Westrock were 11 percent less than in 2014. A description of how the State obtained hourly emission rates is given below this table.

Table 70. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Nassau County Area

	SO_2 Emissions (tpy)		
Facility Name	**2012**	**2013**	**2014**
WestRock	3,575	3,671	3,797
Rayonier	371	462	387
Total Emissions from Facilities in the Area of Analysis	3,946	4,133	4,184

For the Rayonier facility, the actual hourly emissions data were obtained from CEMS. For WestRock, the actual emissions were derived from a combination of CEMS data and hourly fuel usage.

The EPA agrees with Florida's use of CEMS data and actual emissions for the modeling.

For WestRock, the State also provided PTE values for three minor sources. These included two smelt dissolving tanks and a lime kiln. These units were characterized using their maximum permitted short-term emission rates. This information is summarized in Table 71. A description of how the State obtained hourly emission rates is given below this table.

Table 71. SO_2 Emissions based on PTE from Facilities in the Nassau County Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
WestRock	106
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	106

The EPA notes that on January 9, 2015, Florida issued a federally enforceable air construction permit to RockTenn[30] (Permit No. 0890003-046-AC) (now renamed to Westrock), which allows the facility to undertake construction and implement a variety of controls associated with its SO_2 emissions. The Permit authorizes two phases of physical and operational changes to the four largest SO_2 emitting units at the Westrock facility. Included among these are improvements to each of the facility's two recovery boilers to achieve a more stable and consistent combustion and chemical recovery process, and the installation and operation of a piping system to transport non-condensable gases (NCGs) for combustion in the No. 7 Power Boiler. All construction and operational changes are required to be completed no later than December 1, 2017.

The EPA approved Florida's Attainment Demonstration SIP for the Nassau County Nonattainment Area on July 3, 2017, with an effective date of August 2, 2017.[31] Details regarding the new emissions limits and how they were established are available in the Attainment Demonstration SIP documents available in the docket for this action.

The EPA agrees with Florida's use of actual emissions for most of the emissions units at the Westrock and Rayoiner facilities, and use of permit allowable (PTE) emissions from the remaining units at Westrock. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

[30] Since 2015, the name of the facility has changed to Westrock CP, LLC
[31] 82 FR 30749 (July 3, 2017).

9.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

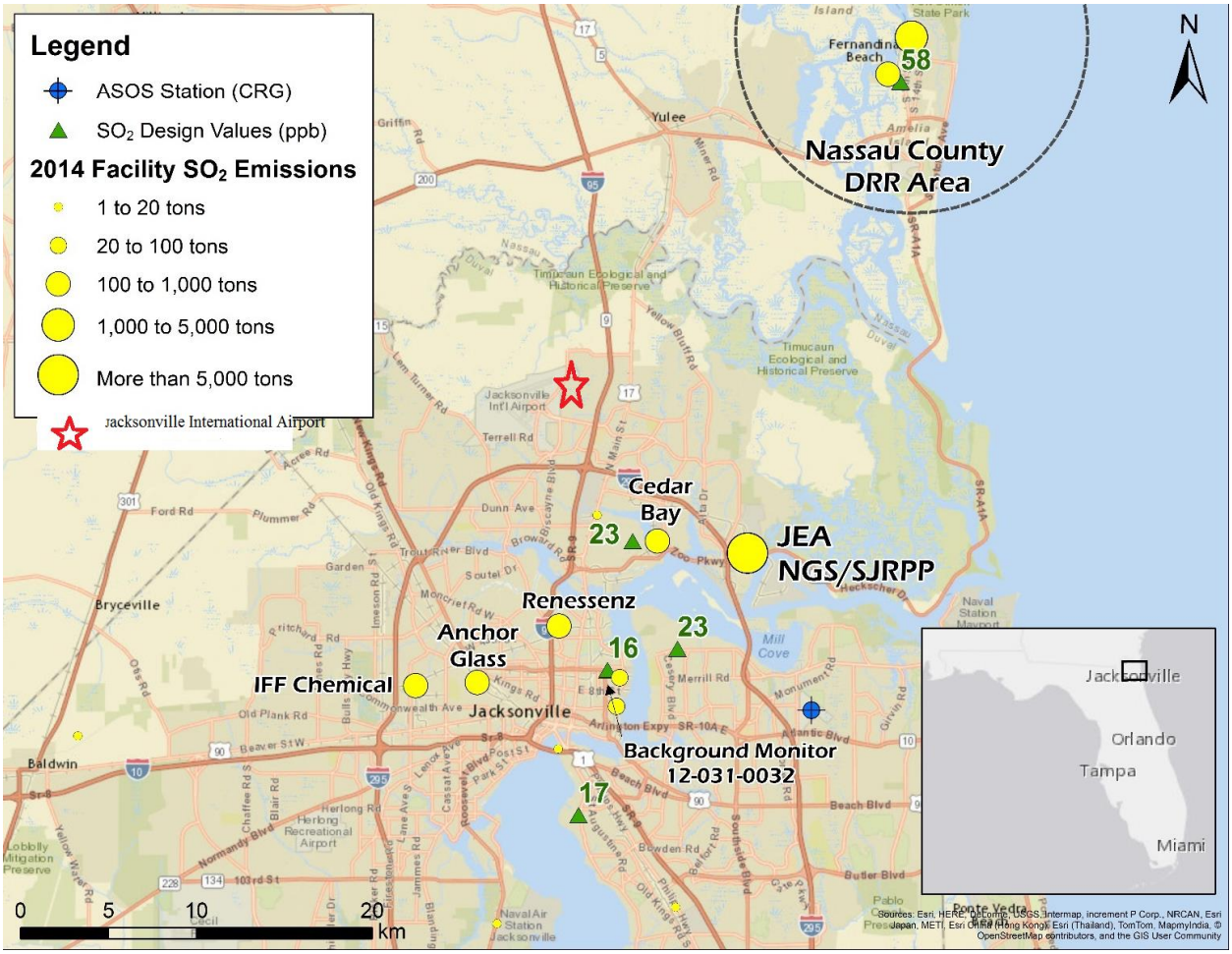
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Nassau, Florida area, the State selected the surface meteorology from Jacksonville's Craig Municipal Airport, located approximately 31 km southwest of the Westrock facility, and coincident upper air observations from Jacksonville International Airport as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using data from Jacksonville's Craig Municipal 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry, wet, or average conditions.

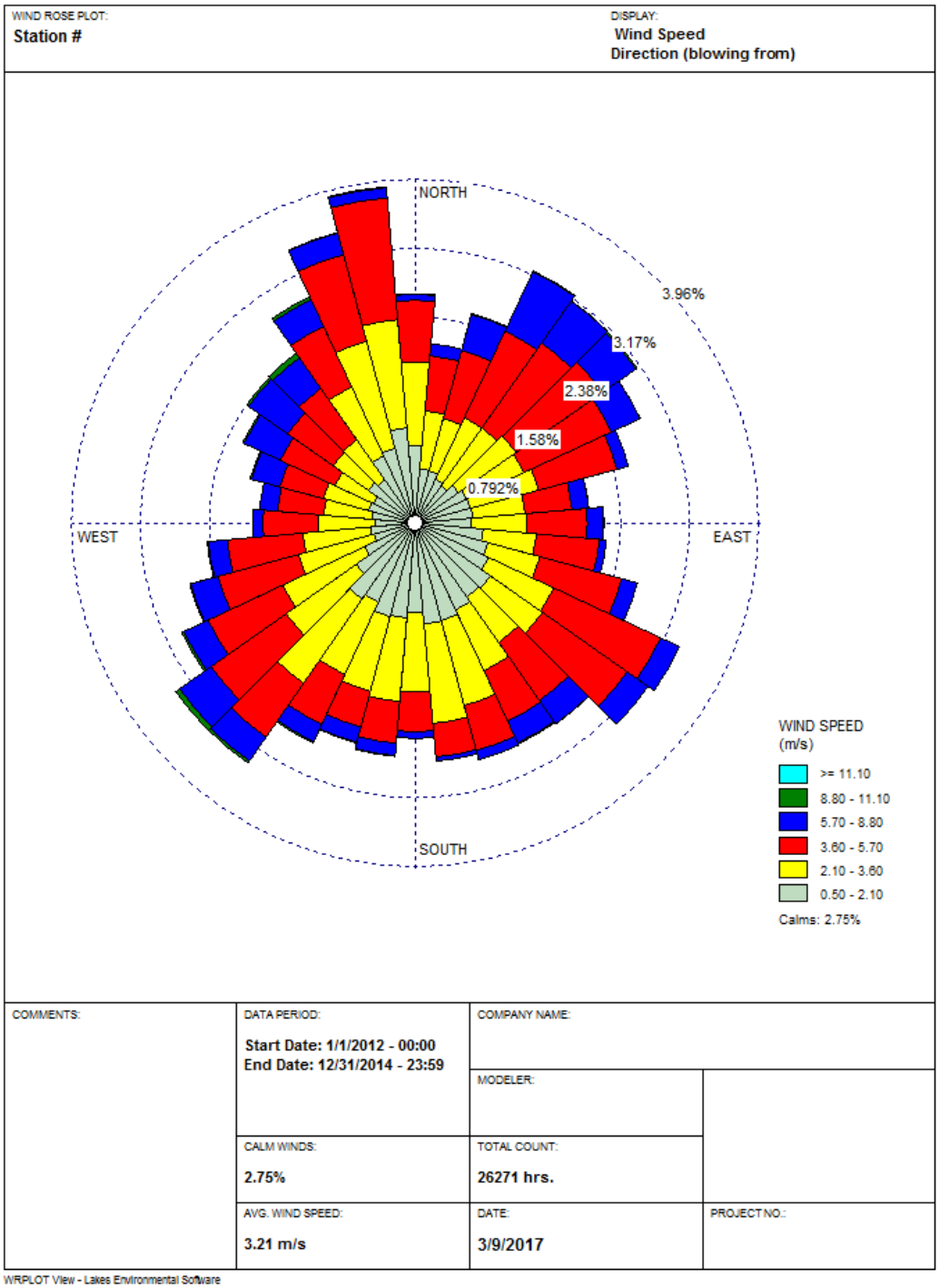
In the figure below, generated by the EPA and Florida, the location of these NWS stations are shown relative to the area of analysis.

Figure 74. Area of Analysis and the NWS stations in the Nassau County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Craig Municipal Airport for the 2012-14 period. In Figure 75, 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 predominantly blow from the north, northeast, southeast and southwest directions.

Figure 75. Craig Municipal Airport 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 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 Northeast Florida Regional Airport, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Jacksonville's Craig Municipal Airport, located approximately 31 km southwest of the Westrock facility, and coincident upper air observations from Jacksonville International Airport as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Westrock can be expected to the northeast of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Jacksonville's Craig Municipal Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

9.3.2.7. 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. Even though Duval County, Florida, is flat, Florida choose to use 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 1992 National Land Cover Dataset.

While Duval County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

9.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Fernandina Beach monitor (AQS Site: AQS site ID # 12-089-0005), approximately 2.5 km south of the Westrock facility. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from the sources explicitly included in the modeling. In this case, any measurement recorded when the wind direction was from 263° to 62° was removed from the background calculation. The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. Table 72 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 72. Tier 2 Temporally Varying Background Concentrations from the Fernandina Beach monitor (AQS Site: AQS site ID # 12-089-0005.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	2.0	1.3	2.3	4.3	12:00	4.7	3.0	4.0	4.3
1:00	2.3	1.7	2.0	4.7	13:00	3.3	3.0	2.7	3.0
2:00	3.0	1.3	2.0	2.7	14:00	2.7	3.3	2.3	3.3
3:00	3.3	1.3	2.0	3.0	15:00	3.7	2.0	2.3	3.7
4:00	2.3	1.7	2.3	4.0	16:00	2.7	2.3	2.7	2.7
5:00	2.7	1.3	2.7	5.0	17:00	1.7	1.3	2.0	3.0
6:00	2.7	1.7	2.3	6.7	18:00	2.3	2.0	2.7	2.7
7:00	2.7	1.7	4.0	4.3	19:00	1.7	1.7	2.3	2.7
8:00	2.3	3.3	3.7	4.0	20:00	2.0	1.7	1.7	2.3
9:00	3.7	5.0	6.7	4.0	21:00	2.0	1.3	2.3	3.0
10:00	4.0	4.0	5.3	5.7	22:00	2.3	1.3	1.3	3.3
11:00	5.7	4.0	6.0	4.7	23:00	2.0	1.7	3.0	2.7

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period.

The EPA believes that the chosen background monitored concentration is representative of the area.

9.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Nassau County area of analysis are summarized below in Table 73.

Table 73. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Nassau County, Florida Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	6
Modeled Stacks	9
Modeled Structures	20
Modeled Fencelines	2
Total receptors	8,991
Emissions Type	Actual
Emissions Years	2012-2014
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Jacksonville's Craig Municipal Airport
NWS Station Upper Air Meteorology	Jacksonville International Airport
NWS Station for Calculating Surface Characteristics	Jacksonville's Craig Municipal Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site # 12-089-0005, Tier 2 based on the time periods used in temporally varying approach.
Calculated Background SO_2 Concentration	Temporally varying

The results presented below in Table 74 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

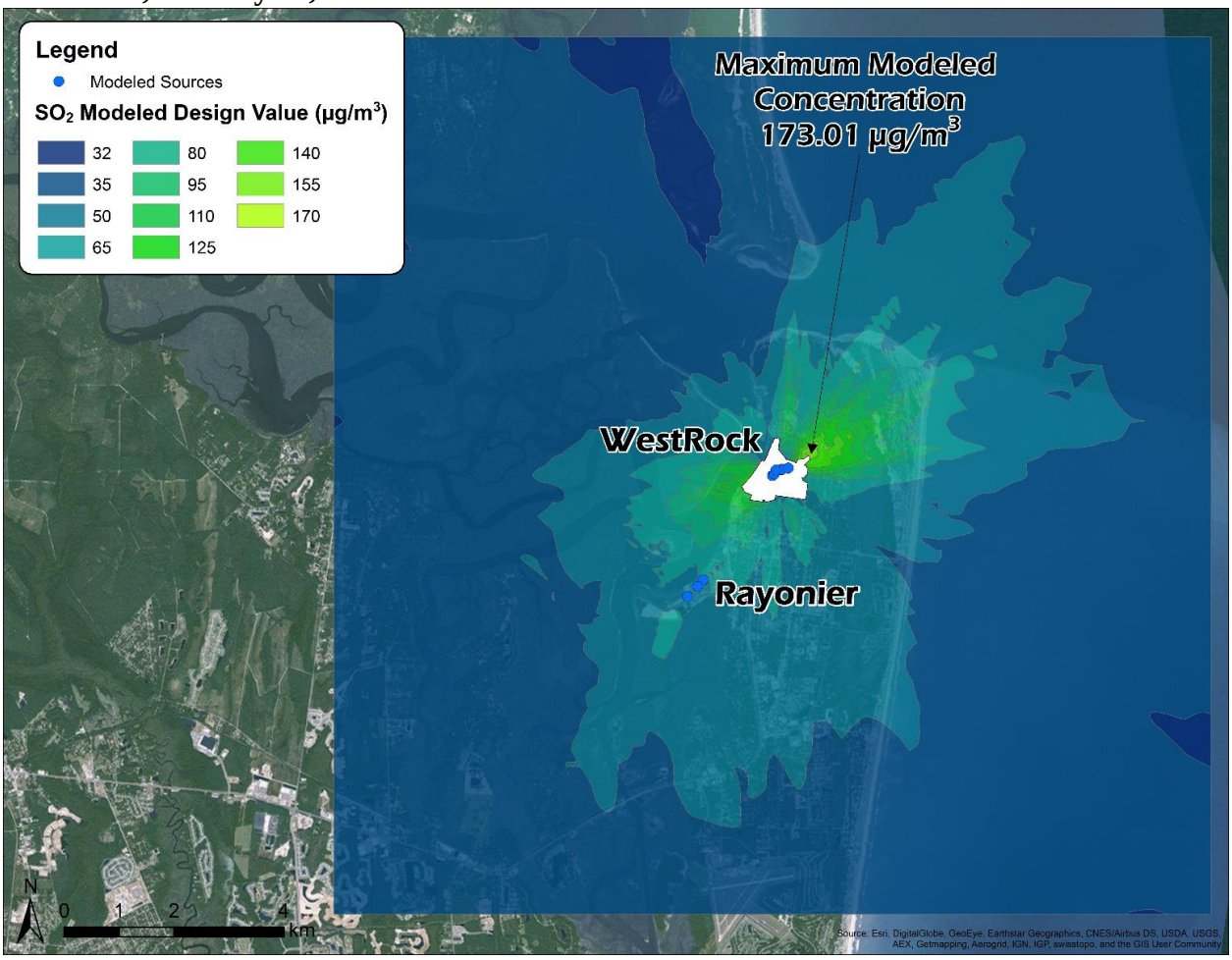
Table 74. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Nassau County, Florida Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	456,931.69	3,394,729.11	173.01	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 173.01 $\mu g/m^3$, equivalent to 66.09 ppb. This modeled concentration included the background concentration of SO_2, and is based on actual emissions from the facilities. Figure 76 below was included as part of the State's recommendation, and indicates that the predicted value occurred slightly north-northeast of WestRock. The State's receptor grid is also shown in the figure.

Figure 76. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Nassau County, Florida Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration.

The State's modeling report for the Nassau County area does directly not address whether emissions from the Westrock facility has the potential to contribute to violations in the existing Nassau County nonattainment area located immediately adjacent to the Westrock facility. However, the modeling receptor grid used in the analysis fully encompasses the existing nonattainment area. No modeled violations of the 1-hour SO_2 NAAQS were found inside (or outside) the existing nonattainment area. Additionally, the monitor located within the nonattainment are is currently attaining the NAAQS with a 2014-2016 design value of 51 ppb.

The current allowable emissions for the Westrock facility reflect reductions resulting from the modeling assessments done for the Attainment Demonstration State Implementation Plan (SIP) for the existing Nassau SO_2 nonattainment area. On January 9, 2015, Florida issued a federally

enforceable air construction permit to RockTenn[32] (Permit No. 0890003-046-AC) (now renamed to Westrock), which allows the facility to undertake construction and implement a variety of controls associated with its SO_2 emissions. The Permit authorizes two phases of physical and operational changes to the four largest SO_2 emitting units at the Westrock facility. Included among these are improvements to each of the facility's two recovery boilers to achieve a more stable and consistent combustion and chemical recovery process, and the installation and operation of a piping system to transport non-condensable gases (NCGs) for combustion in the No. 7 Power Boiler. All construction and operational changes are required to be completed no later than December 1, 2017. The EPA approved Florida's Attainment Demonstration SIP for the Nassau County Nonattainment Area on July 3, 2017, with an effective date of August 2, 2017.[33] The Attainment Demonstration contains modeling which demonstrates that the area will be attaining the NAAQS with the new allowable limits for the Westrock facility. Details regarding the new emissions limits and how they were established are available in the Attainment Demonstration SIP documents available in the docket for this action. The potential for the emissions from the Westrock facility contributing to future violations in the existing Nassau nonattainment area was fully evaluated in the Attainment Demonstration SIP.

9.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA concurs that the modeling for the Nassau area has been performed in a manner consistent with the SO_2 Modeling TAD. The EPA concurs with inclusion of only the Westrock and Rayonier facilities in the modeling and with the background monitor and concentration used. The other SO_2 emissions sources in the area have small amounts of emissions and/or are located large distances from the Westrock DRR Source. The modeling domain used is sufficient to resolve maximum concentrations in both the existing nonattainment area and the undesignated portion of the Nassau County area. The State's selection of surface and upper air meteorological stations and surface characteristics for the area are also appropriate to make a valid modeling demonstration. The state adequately represented the topography of the area with the model and its preprocessors. The modeling used actual emissions for the Westrock sources and predicted no violations of the 1-hour SO_2 NAAQS both inside and outside the existing Nassau nonattainment area. The EPA concurs with this determination. Additionally, the combination of Florida's modeling report and the modeling done for the existing Nassau County Nonattainment Area Attainment Demonstration SIP show that Westrock is not contributing to any violations of the 1-hour SO_2 NAAQS.

9.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Nassau 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.

[32] Since 2015, the name of the facility has changed to Westrock CP, LLC
[33] 82 FR 30749 (July 3, 2017).

9.5. Jurisdictional Boundaries in the Nassau County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Nassau County. This factor did not play a significant role in the EPA's analysis.

9.6. Other Information Relevant to the Designations for the Nassau County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Hamilton County. The State expects that the ambient concentrations and emissions of SO_2 in Nassau County will continue to fall as they have for at least the past decade. 2015 emissions of SO_2 at WestRock were 11% less than in 2014. The state anticipates that the continued implementation of the Nassau County nonattainment area's SO_2 attainment plan through 2017 and the recently permitted construction of the LignoTech Facility at Rayonier (that will sequester much of Rayonier's sulfur into a commercial product) will result in further reductions of these lower levels of SO_2 emissions, ensuring continued compliance with the NAAQS.

9.7. The EPA's Assessment of the Available Information for the Nassau County Area

The EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the combination of Florida's modeling report and the modeling done for the existing Nassau County Nonattainment Area Attainment Demonstration SIP show that Westrock is not contributing to any violations of the 1-hour SO_2 NAAQS.

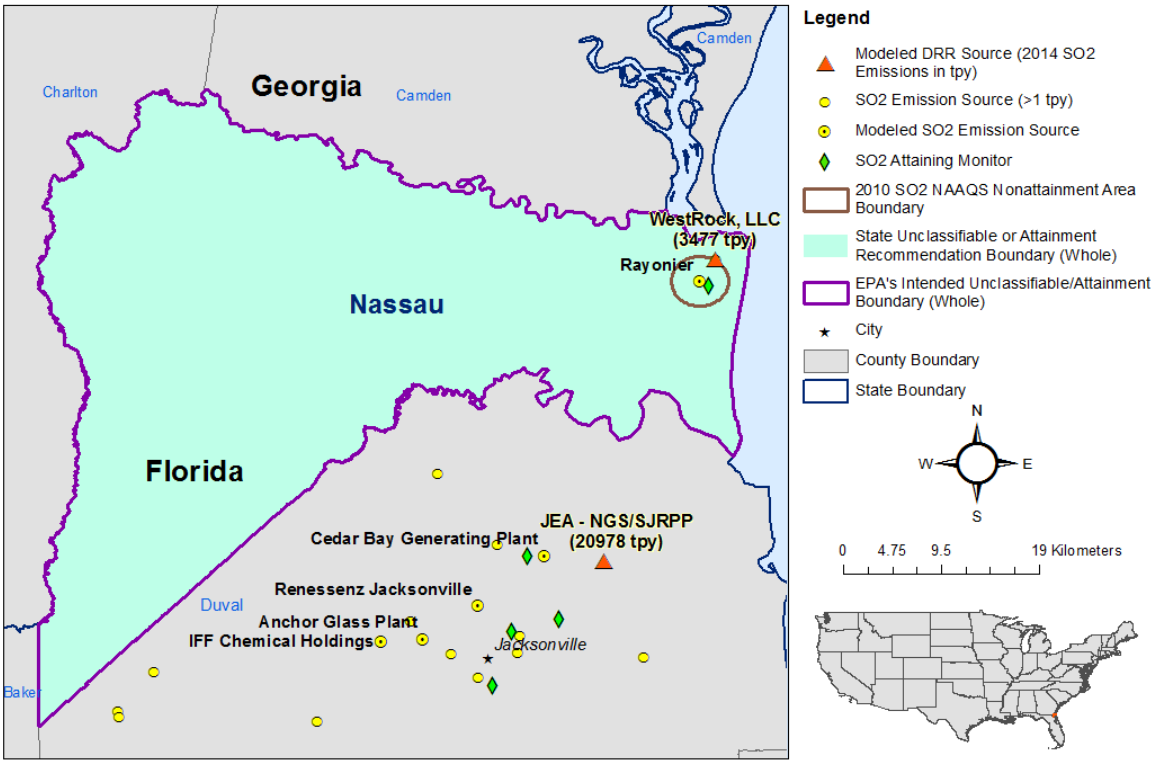
The EPA believes that our intended unclassifiable/attainment area, bounded by Nassau County (with the exception of that portion already designated,) will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

9.8. Summary of Our Intended Designation for the Nassau 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 a portion of the Nassau County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of the portions of Nassau County that are not designated nonattainment in association with other sources. Although the State recommended that the area surrounding the WestRock CP, LLC facility be designated "attainment" or "unclassifiable," the EPA's intended partial county boundary is consistent with the approach used in prior designations for areas with no monitored or modeled violation.

Figure 77 shows the boundary of this intended designated area.

Figure 77. Boundary of the Intended Nassau County Unclassifiable/Attainment Area



10. Technical Analysis for the Orange County Area

10.1. Introduction

The EPA must designate the Orange County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Orange County.

10.2. Air Quality Monitoring Data for the Orange County Area

This factor considers the SO_2 air quality monitoring data in the area of Orange County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data:

- The Winter Park SO_2 monitor (AQS ID: 12-095-2002) is located at 28.596389, -81.3625 in Orange County. The monitor is located in Orlando, Florida, 14.2 miles northwest of Orlando Utilities Commission – Curtis H. Stanton Energy Center (Stanton Energy Center). Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent monitored SO_2 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 SO_2 design value of 4 ppb. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations near Stanton Energy Center or this area and so it cannot be used to designate this area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Orange County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

10.3. Air Quality Modeling Analysis for the Orange County Area Addressing Stanton Energy Center

10.3.1. Introduction

This section 10.3 presents all the available air quality modeling information for a portion of Orange County that includes the Stanton Energy Center. (This portion of Orange County will often be referred to as "the Orange County area" within this section 10.3). This area contains the following SO_2 source around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The Stanton Energy Center emitted 2,000 tons or more annually. Specifically, Stanton Energy Center emitted 2,533.00 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

In its submission, Florida recommended that an area that includes the area surrounding the facility, specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from this facility and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing PTE emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA 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.

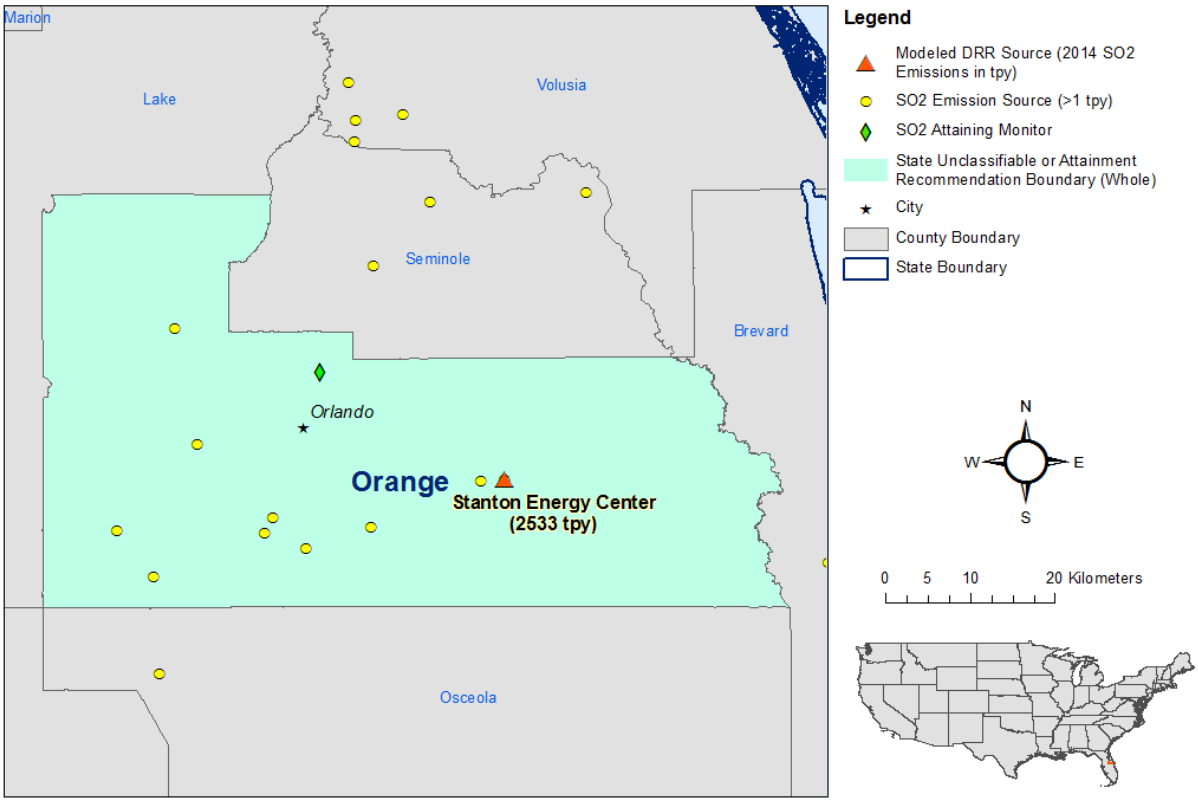
The area that the State has assessed via air quality modeling is located in the Orlando area in Orange County.

As seen in Figure78 below, the Stanton Energy Center is located in Orlando near Hal Scott Regional Preserve and Park.

Also included in the figure are other nearby emitters of SO_2.[34] (unmarked yellow dots). These are Orange County Solid Waste Facility, Middlesex Asphalt Orange Plant #1, Orlando Cogen Limited, L.P., JYP Orlando, LLC, Preferred Materials Asphalt Plant, Florida Gas Station 18, Brevard County Central Disposal, and Seminole County Osceola Landfill in Orange County.

[34] SO_2 emitters of 1 tpy or more are shown in Figure 78.

Figure 78. Map of the Orange County Area Addressing Stanton Energy Center



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 two modeling assessments, including two assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 75. Modeling Assessments for the Orange County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	01/13/2017	Orange County Modeling Report	Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

10.3.2. Modeling Analysis Provided by the State

10.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

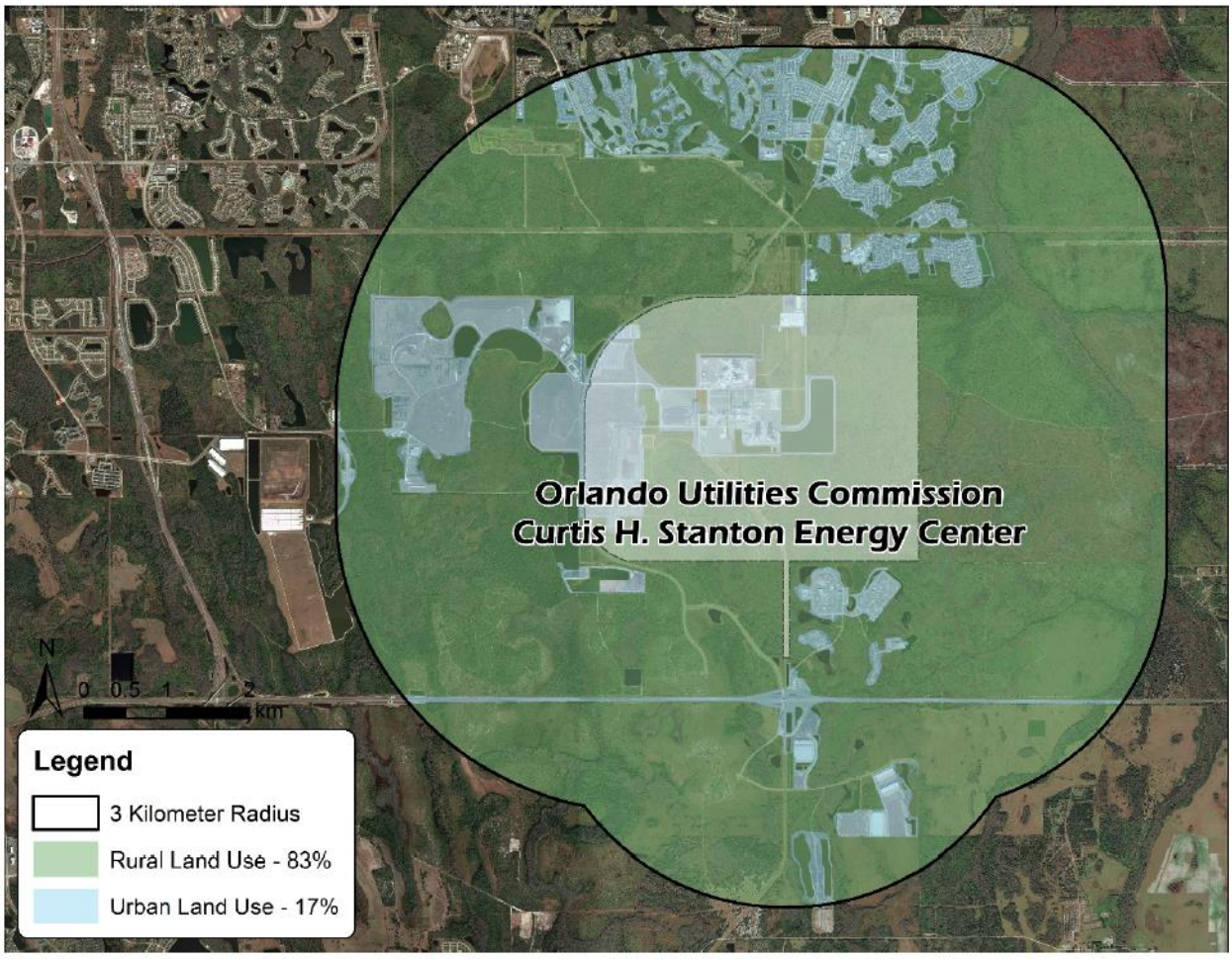
10.3.2.2. Modeling Parameter: Rural or Urban Dispersion

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 SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The state used the Auer method in determining the land use around the Big Bend facility. The Auer method requires an analysis of the land use within a 3-km radius around a facility to determine whether the majority of the land is classified as rural or urban. The state concluded the Stanton Energy Center constitutes a majority (83 percent) rural land used as seen in Figure 79. From that analysis the rural method was utilized in AERMOD.

Figure 79. Land use for the area around the Stanton Energy Center. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode. Based upon the land use analysis performed by Florida, the EPA agrees that use of rural dispersion coefficients is appropriate.

10.3.2.3. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The Stanton Energy Center of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Orange County area, the State has included no other emitters of SO_2 within 35 km of Stanton Energy Center in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. In addition to Stanton Energy Center, the other emitters of SO_2 included in the area of analysis which were evaluated for potential inclusion in the modeling analysis are: Orange County Solid Waste Facility, Middlesex Asphalt Orange Plant #1, Orlando Cogen Limited, L.P., JYP Orlando, LLC, Preferred Materials Asphalt Plant, Florida Gas Station 18, Brevard County Central Disposal, Seminole County Osceola Landfill. No source, other than Stanton, was explicitly modeled. Table 76 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 76. SO_2 Emissions Sources within 35 km of the Stanton Energy Center. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from Stanton (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
095-0137	OUC Stanton Energy Center	0	0	2,533.00	Yes
095-0113	Orange County Solid Waste Facility	2	40	3.67	No
095-1259	Middlesex Asphalt Orange Plant #1	22	440	17.39	No
095-0203	Orlando Cogen Limited, L.P.	25	500	2.20	No
095-0128	JYP Orlando, LLC	26	520	3.56	No
117-0019	Preferred Materials Asphalt Plant	29	580	3.20	No
095-0190	Florida Gas Station 18	32	640	3.20	No
009-0069	Brevard County Central Disposal	35	700	41.29	No
117-0084	Seminole County Osceola Landfill	35	700	3.39	No

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and/or are located large distances from the Stanton Energy Center.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

The State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within Stanton's fenceline were removed and receptors were placed with 50 m spacing along the fenceline. This grid placement was sufficient to fully resolve the maximum modeled concentrations in the Orange County modeling demonstration.

The receptor network contained 6,297 receptors, and the network covered the entirety of the Stanton Energy Center as show in Table 77.

Table 77. Stanton Energy Center Dense Receptor Grid Parameters. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Boiler 2 Stack
Unit UTM Zone	17N
Unit UTM Easting (m)	483,587.80
Unit UTM Northing (m)	3,150,662.10
Actual Stack Height (m)	167.64
Expected Distance to Max Concentration (m)	1,676
20 Times Stack Height (m)	3,353
100 m Receptor Spacing - Extent from the Origin (m)	3,500
250 m Receptor Spacing - Extent from the Origin (m)	6,000
500 m Receptor Spacing - Extent from the Origin (m)	8,500
Plant Boundary Receptor Spacing (m)	50
Total Receptors	6,297

Figures 80 and 81, included in the State's recommendation, show the State's chosen area of analysis surrounding the Stanton Energy Center, as well as the receptor grid for the area of analysis.

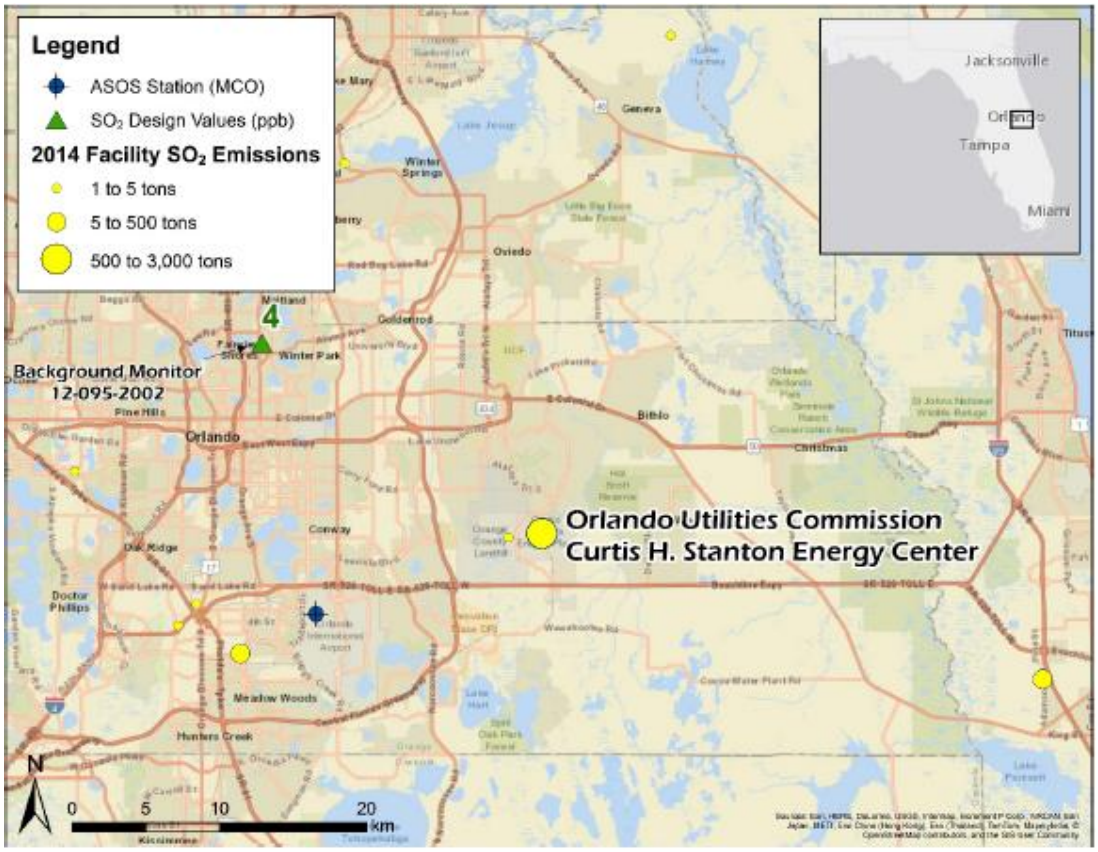
Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. The state chose not to employ this process and instead included receptors in all areas the State considered ambient air within 8.5 km of Stanton. Figure 81 from the Florida Modeling Report shows the Stanton Energy Center fence line boundary. However, no information was provided in Florida's Modeling Report for the Orange County area to document that public access to the facility property is prevented by a fence or some other physical barrier. The EPA contacted Florida

regarding this issue. Florida responded via email[35] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

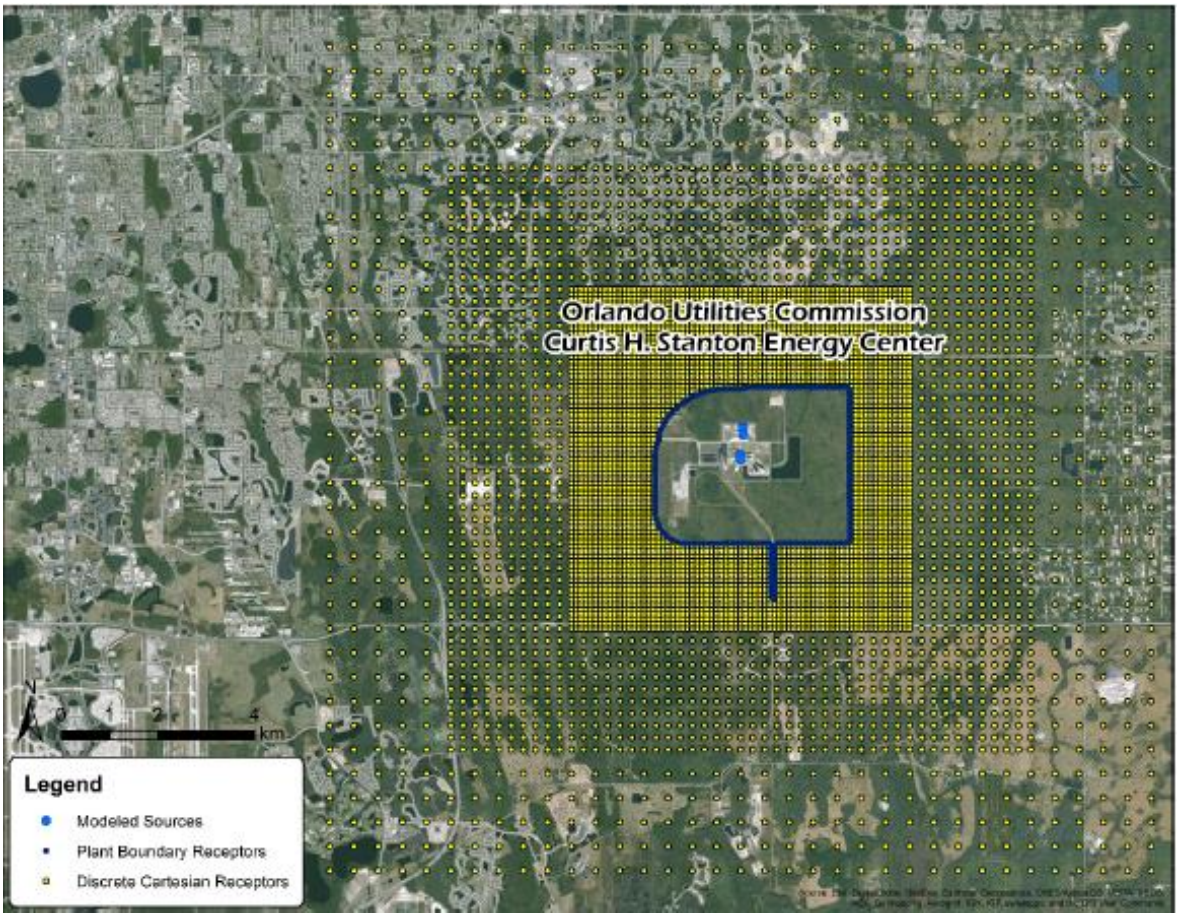
After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 80. Area of Analysis for the Orange County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[35] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 81. Receptor Grid for the Orange County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



10.3.2.4. 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.

There are currently 8 sources within 35 km of the Stanton Energy Center. The State did not model any other source that is within 35 km due to their Q/d. The nearby sources emitted SO_2 emissions significantly below 2,000 tons and have emissions less than 20d.[36]

The State characterized this source within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the State used stack heights consistent

[36] The 20d method suggests that if a source's annual emissions in tons (Q) is less than its distance from the primary source in kilometers (d) multiplied by 20, then it is unlikely to have a significant impact near the primary source.

with the GEP Policy in conjunction with allowable PTE 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees with Florida's method for characterizing the area and the assessment of nearby facilities modeled. The use of GEP stack height calculations is appropriate given the use of PTE emissions. Building downwash is also appropriately accounted for.

10.3.2.5. 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 Stanton Energy Center and no other emitters of SO_2 within 35 km in the area of analysis. The state has chosen to model this facility using PTE emissions shown in the Table 78 below.

Table 78. SO_2 Emissions based on PTE from Facilities in the Orange County Area

Facility Name	SO_2 Emissions PTE tpy
OUC Stanton Energy Center	17,025
Total PTE Emissions from All Modeled Facilities in the State's Area of Analysis	17,025

The PTE values were obtained by multiplying the maximum short term limits for each unit by 8,760 hours per year, and dividing by 2,000 to obtain tons. For the purposes of this DRR, the facility recently obtained a permit for their two primary boilers (Boiler 1 and 2) that makes the MATS SO_2 surrogate limit of 0.20 lb SO_2/MMBtu a federally enforceable limit. This air permit was issued by Florida on January 10, 2017.

The SO_2 emission limits for the two primary boilers are based on longer-term averaging periods (e.g., 30-day average limits) than the 1-hr SO_2 NAAQS. For these sources, Florida used the EPA guidance methodology to scale the longer-term average emission limit by the ratio of each source's historic 99th percentile one-hour average emission rate to its 99th percentile longer-term average emission rate. This analysis was performed by Florida using CEMS data from 2012 – 2014.

The EPA agrees with Florida's use of permit allowable (PTE) emissions for emissions units at the Stanton Energy Center. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

10.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

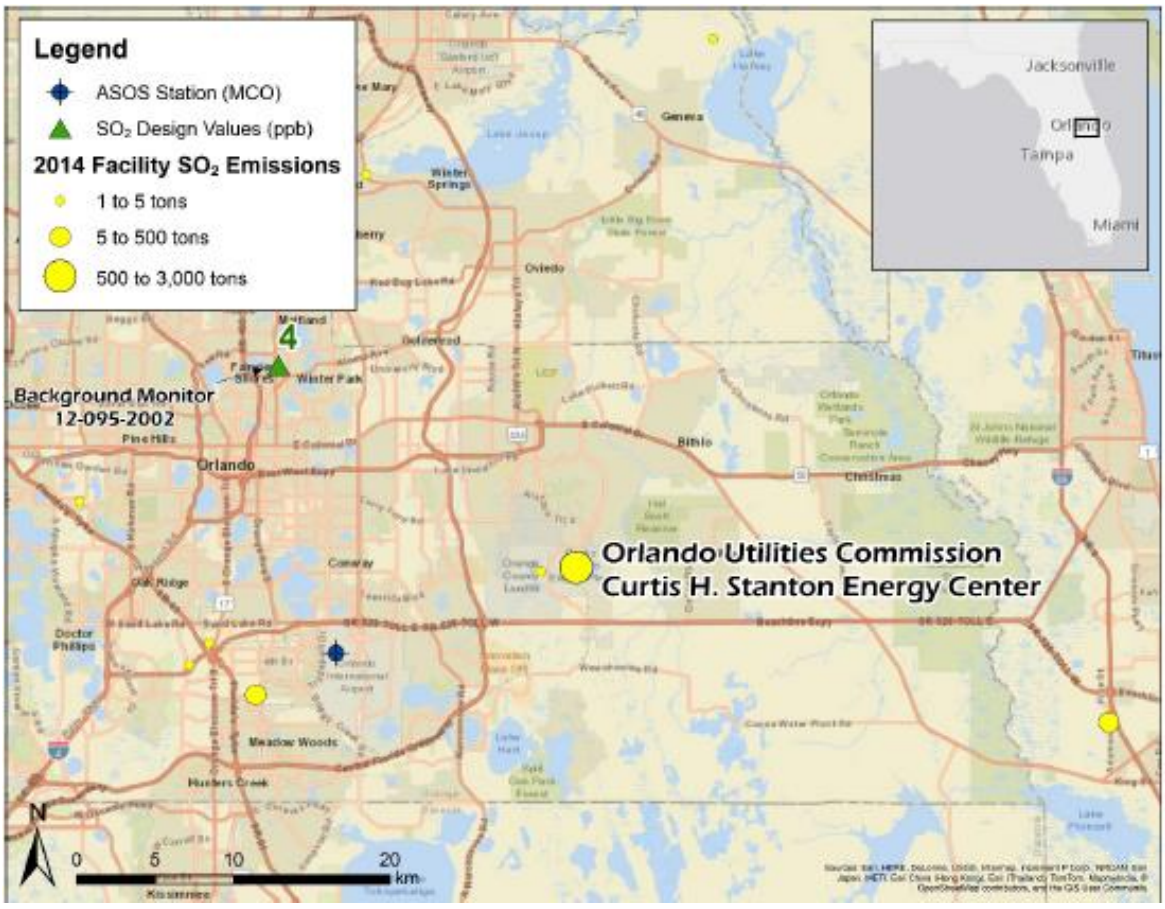
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Orange area, the State selected the surface meteorology from Orlando International Airport, located approximately 17 km southwest of the Stanton Energy Center, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis.

The State used AERSURFACE version 13016 using data from Orlando International 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at a monthly temporal resolution for dry and wet conditions.

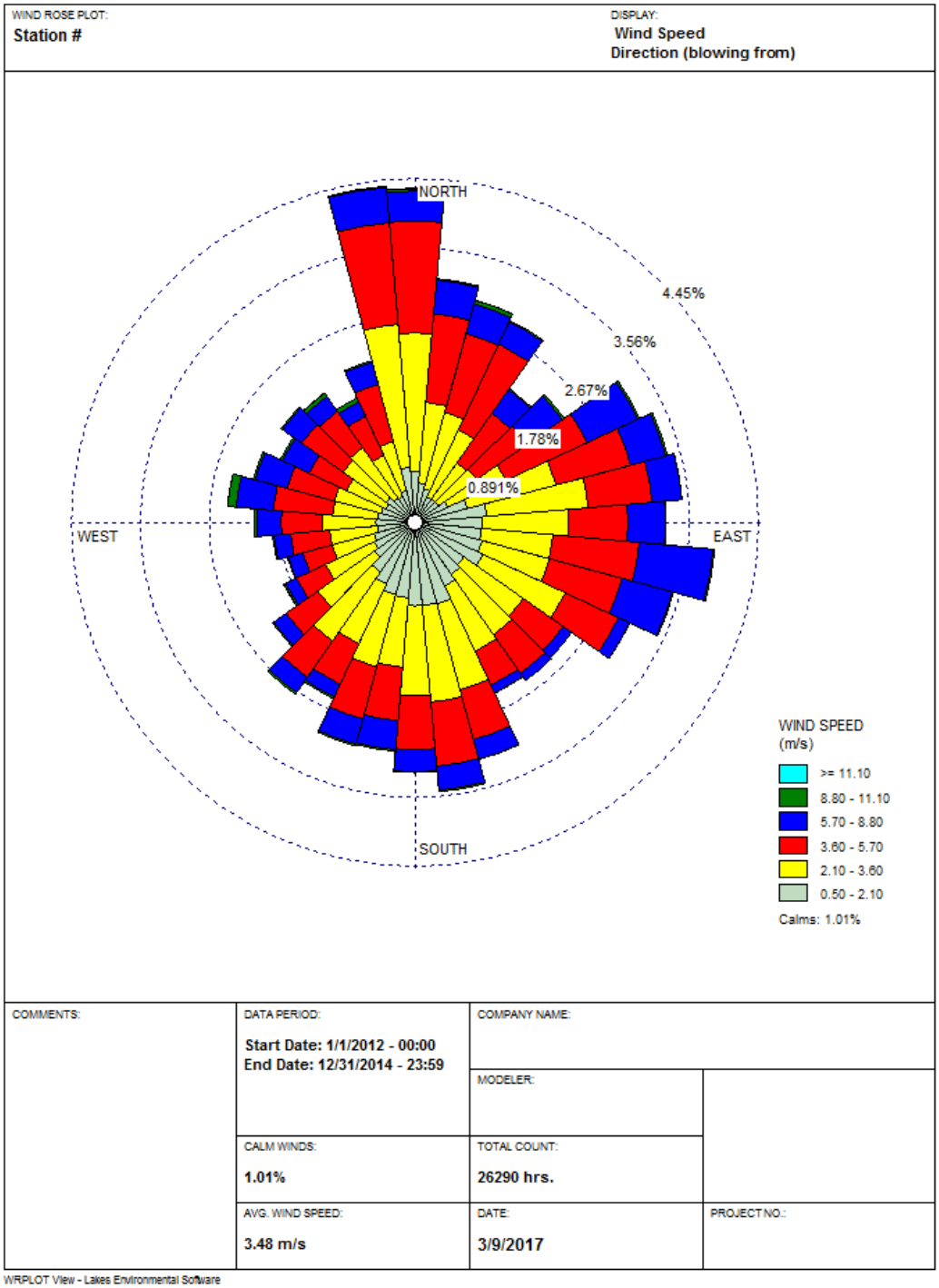
In the figure below, generated by the EPA and the state, the location of this NWS station is shown relative to the area of analysis.

Figure 82. Area of Analysis and the NWS stations in the Orange County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The EPA generated a windrose for the Orlando International Airport for the 2012-14 period. In Figure 83, 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 predominately blow from the north and east directions.

Figure 83. Orlando International Airport 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 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 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 m/s 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 believes the meteorology and surface characteristics used in the State’s modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Orlando International Airport, located approximately 17 km southwest of the Stanton Energy Center facility, and coincident upper air observations from Ruskin, Florida, as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Stanton Energy Center can be expected to the southwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Orlando International Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

10.3.2.7. 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. 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 1992 National Elevation Database.

While Orange County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

10.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 99^{th} percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State chose to use a tier 2 approach. Data were obtained from 2012-2014 time period from the Lake Isle Estates - Winter Park monitor (AQS Site: AQS site ID # 12-095-2002), approximately 23 km northwest of the Stanton Energy Center. In order to avoid double-counting the emissions from the explicitly modeled sources, Florida filtered the data to remove measurements when the wind direction could transport pollutants from Stanton Energy Center. In this case, any measurement recorded when the wind direction was from 80° to 169° was removed from the background calculation.

The 99th percentile (2nd high) concentration for each hour by season was then averaged across the three years and the resulting array was input to AERMOD with the BACKGRND SEASHR keyword. Table 79 contained in the Florida Modeling Report provides the temporally varying background concentrations used in the modeling.

Table 79 Tier 2 Temporally Varying Background Concentrations from the Lake Isle Estates - Winter Park monitor (AQS Site: AQS site ID # 12-095-2002.) Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	0.67	0.33	0.33	0.00	12:00	2.00	0.33	0.33	0.67
1:00	0.67	0.67	1.00	0.00	13:00	1.33	0.67	0.33	0.67
2:00	1.00	0.33	0.33	0.00	14:00	1.00	0.00	0.00	0.67
3:00	0.67	0.00	0.67	0.00	15:00	1.00	0.00	0.00	0.67
4:00	0.67	0.00	1.33	0.67	16:00	1.33	0.67	0.00	0.67
5:00	0.67	0.00	0.67	0.33	17:00	1.00	0.00	0.00	0.33
6:00	0.67	0.33	1.67	0.33	18:00	1.00	0.00	0.00	0.00
7:00	0.67	0.00	2.67	1.00	19:00	1.00	0.33	0.33	0.33
8:00	1.00	0.67	1.67	1.00	20:00	0.67	0.33	0.00	0.67
9:00	2.33	1.33	1.67	1.00	21:00	1.00	0.33	0.33	0.67
10:00	2.67	1.33	1.33	1.67	22:00	1.00	0.00	0.00	0.33
11:00	2.67	0.67	0.67	1.33	23:00	1.00	0.00	0.00	0.00

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

10.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Orange County area of analysis are summarized below in Table 80.

Table 80. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Orange County Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	1
Modeled Stacks	5
Modeled Structures	26
Modeled Fencelines	1
Total receptors	6,297
Emissions Type	Allowable PTE
Emissions Years	2017
Meteorology Years	2012-2014
NWS Station for Surface Meteorology	Orlando International Airport
NWS Station Upper Air Meteorology	Ruskin, Florida
NWS Station for Calculating Surface Characteristics	Orlando International Airport
Methodology for Calculating Background SO_2 Concentration	AQS Site #12-095-2002 Tier 2, the time periods used in temporally varying approach
Calculated Background SO_2 Concentrations	Temporally varying

The results presented below in Table 81 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

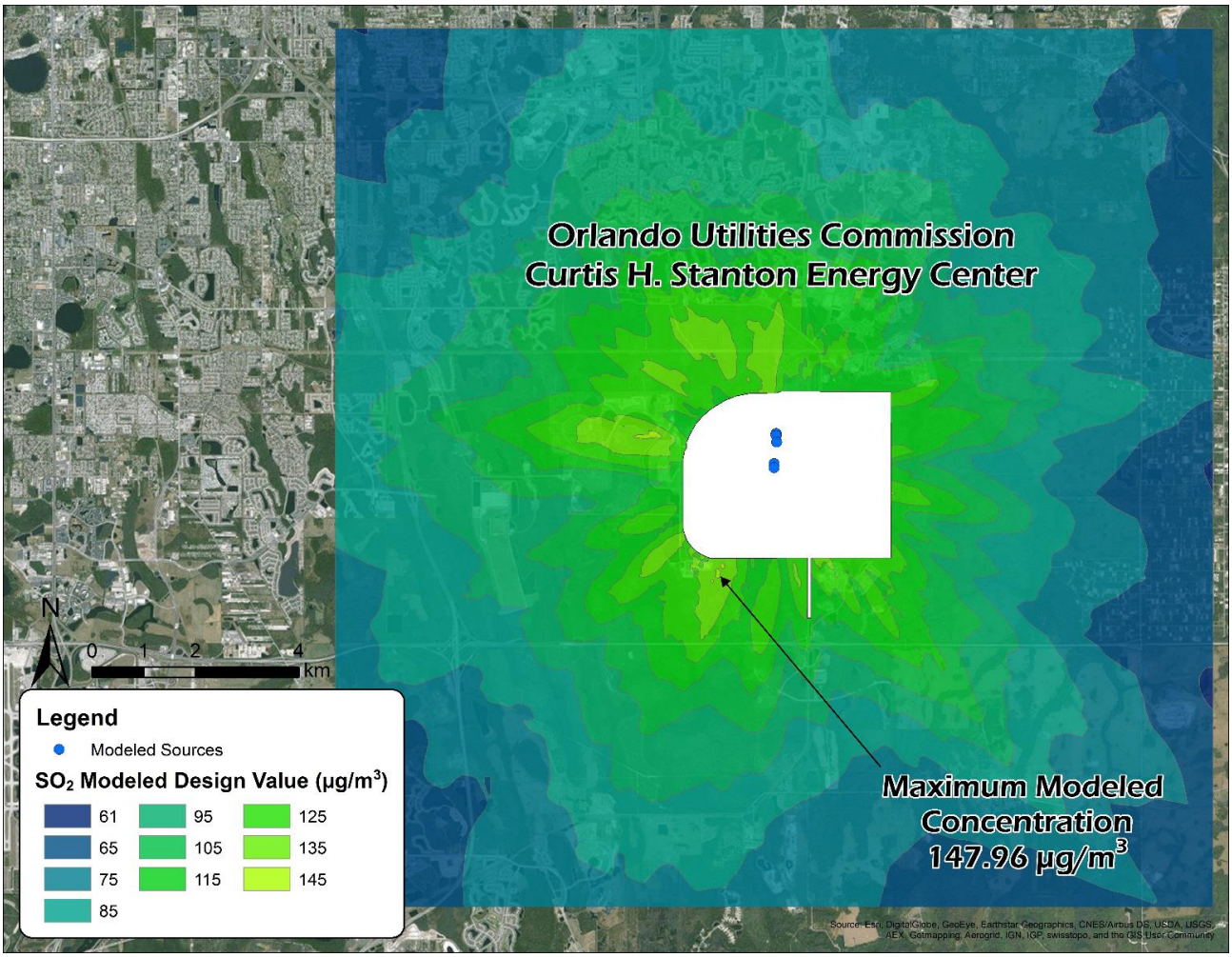
Table 81. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Orange County Area

Averaging Period	Data Period	Receptor Location 17N		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM/Latitude	UTM/Longitude	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	482,487.81	3,148,662.00	147.96	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 147.96 µg/m^3, equivalent to 56.49 ppb. This modeled concentration included the background concentration of SO_2, and is based on PTE emissions from the facility. Figure 84 below was included as part of the State's recommendation, and indicates that the predicted value occurred south of the Stanton Energy Center. The extent of the State's receptor grid is also shown in the figure.

Figure 84. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Orange County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Additionally, based on the available information for the remaining areas in Florida, including monitoring and modeling, there are no current SO_2 nonattainment areas near Orange County, Florida, and no expected nonattainment areas for this third round of designations. Therefore, the Orange County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

10.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the Stanton Energy Center. Given the criteria for selecting nearby sources, we believe that the decision not to include any additional facilities in the modeling analysis was correct. Permitted allowable emissions were used in the analysis, which provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the Stanton Energy Center. Additionally, the EPA believes that the Stanton Energy Center is not contributing to any violations of the 1-hour SO_2 NAAQS.

10.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Orange 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.

10.5. Jurisdictional Boundaries in the Orange County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Orange County. This factor did not play a significant role in the EPA's analysis.

10.6. Other Information Relevant to the Designations for the Orange County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Orange County. Ambient concentrations and emissions of SO_2 have declined steadily for the past decade in Orange County. The State anticipates that the implementation of a variety of national rules and regulations (particularly the MATS) and economic forcing will result in the maintenance or even further reduction of these lower levels of SO_2 emissions, ensuring continued compliance with the NAAQS.

10.7. The EPA's Assessment of the Available Information for the Orange County Area

EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the EPA believes that the Stanton Energy Center is not contributing to any violations of the 1-hour SO2 NAAQS.

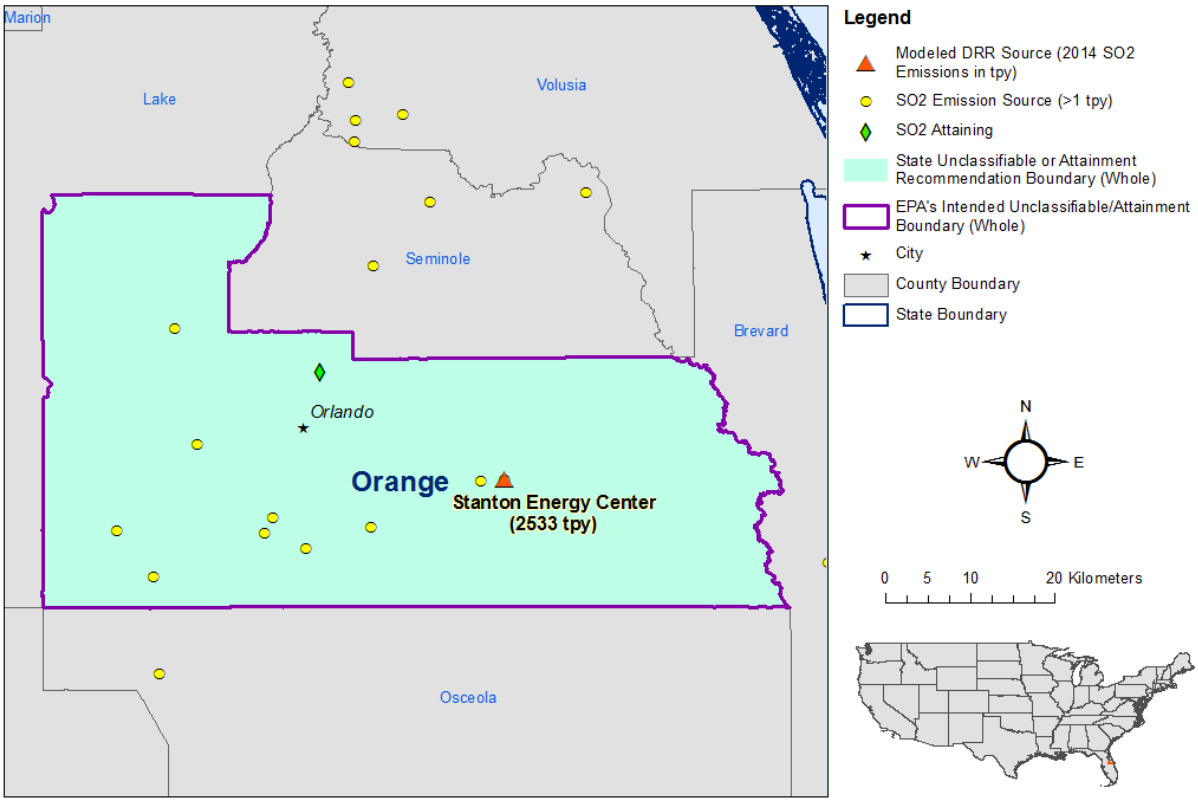
The EPA believes that our intended unclassifiable/attainment area, bounded by Orange County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

10.8. Summary of Our Intended Designation for the Orange 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 Orange County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of Orange County (in its entirety.) Although the State recommended that the area surrounding the Stanton Energy Center be designated "attainment" or "unclassifiable," the EPA's intended whole county boundary is consistent with the approach used in prior designations for counties with no monitored or modeled violation.

Figure 85 shows the boundary of this intended designated area.

Figure 85. Boundary of the Intended Orange County Unclassifiable/Attainment Area



11. Technical Analysis for the Putnam County Area

11.1. Introduction

The EPA must designate the Putnam County area by December 31, 2017, because the area has not been previously designated and Florida has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Putnam County.

11.2. Air Quality Monitoring Data for the Putnam County Area

This factor considers the SO_2 air quality monitoring data in the area of Putnam County. Florida did not include monitoring data for this area, but stated in its January 13, 2017, letter that: "With the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, the Department recommends that the entire State of Florida be designated as 'attainment' or 'unclassifiable' for the 2010 SO_2 NAAQS. This recommendation is based on the required area-specific analyses under the DRR and current data from the State's existing SO_2 ambient monitoring network."

The EPA reviewed the available air quality monitoring data in AQS database and found the following nearby data:

- The Palatka Barge Port SO_2 monitor (AQS ID: 12-107-1008) is located at 29.6877480922, -81.6565089054 in Putnam County. The monitor is located in Palatka, Florida, 3.4 miles northwest of Seminole Generating Station. Data collected by this monitor is comparable to the NAAQS, and indicates that the most recent monitored SO_2 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 SO_2 design value of 20 ppb. However, this monitor was not located to characterize the maximum 1-hr SO_2 concentrations near the Seminole Generating Station or the area and so it cannot be used to designate the area. Instead, Florida provided an air quality modeling analysis to characterize the maximum 1-hr SO_2 concentrations in the area (see the section immediately below).

In reviewing the available air quality monitoring data in AQS, the EPA determined that other than the data described above, there is no additional relevant data in AQS collected in or near Putnam County that could inform the intended designation action. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values.

11.3. Air Quality Modeling Analysis for the Putnam County Area Addressing Seminole Generating Station

11.3.1. Introduction

This section 11.3 presents all the available air quality modeling information for a portion of Putnam County that includes Seminole Generating Station. (This portion of Putnam County will often be referred to as "the Putnam County area" within this section 11.3.) This area contains the following SO_2 sources around which Florida is required by the DRR to characterize SO_2 air quality, or alternatively to establish an SO_2 emissions limitation of less than 2,000 tons per year:

- The Seminole Generating Station facility emitted 2,000 tons or more annually. Specifically, Seminole Generating Station emitted 13,016.59 tons of SO_2 in 2014. This source meets the DRR criteria and thus is on the SO_2 DRR Source list, and Florida has chosen to characterize it via modeling.

- The Georgia Pacific Palatka Mill facility does not emit 2,000 tons or more annually and is not on the SO_2 DRR Source list, but was included in the modeling assessment.

In its submission, Florida recommended that an area that includes the area surrounding the Seminole Generating Station , specifically that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties, based in part on an assessment and characterization of air quality impacts from these facilities and other nearby sources that may have a potential impact in the area where the 2010 SO_2 NAAQS may be exceeded. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing hybrid of actual and PTE emissions. After careful review of the State's assessment, supporting documentation, and all available data, the EPA 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.

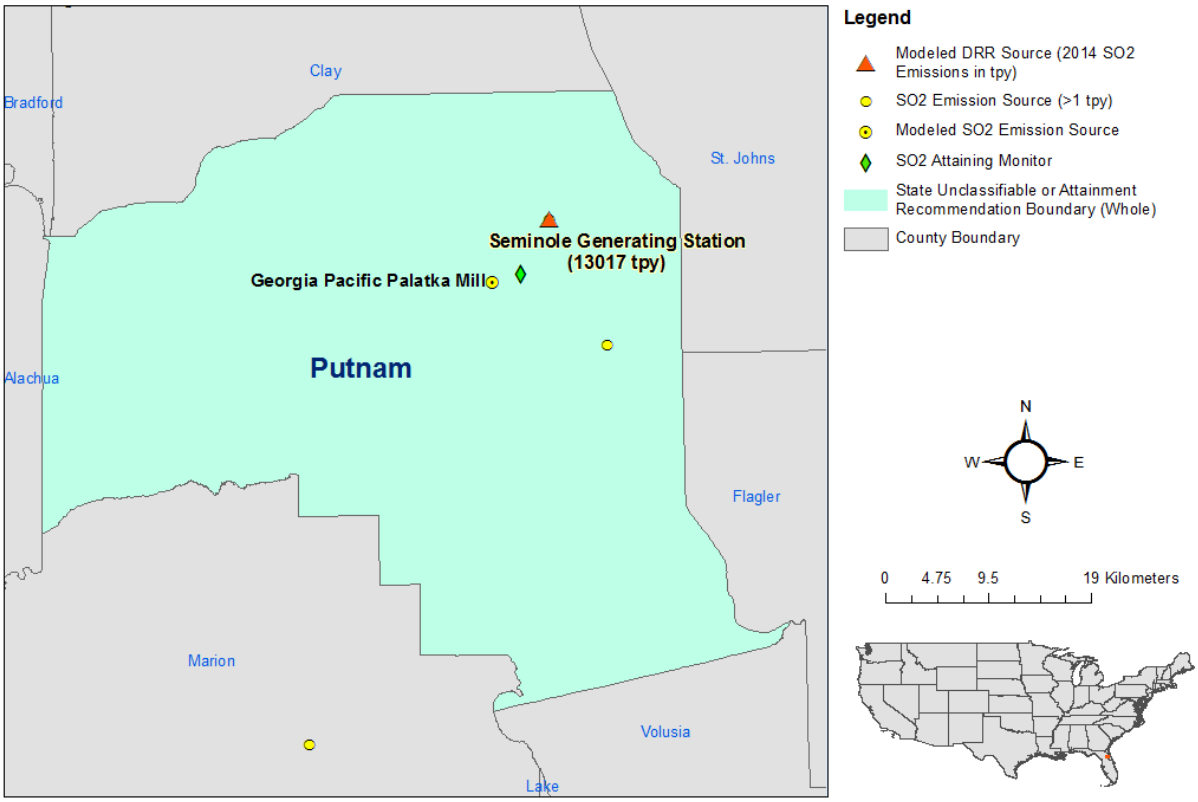
The area that the State has assessed via air quality modeling is located in Putnam County on the eastern coast line of Florida.

As seen in Figure 86 below, the Seminole Generating Station facility is located northeast Florida along the St. Johns River.

Also included in the figure are other nearby emitters of SO_2.[37] These are Continental Palatka, Georgia Pacific Palatka Mill, and SAPA Extrusion St. Augustine. These facilities are within 35 km southwest of the Seminole Generating Station.

[37] All other SO_2 emitters of 2,000 tpy or more (based on information provided by the State of Florida) are shown in Figure 8684. If no sources not named previously are shown, there are no additional SO_2 emitters above this emission level in the vicinity of the named source(s).

Figure 87. Map of the Putnam County Area Addressing Seminole Generating Station



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 two modeling assessments, including two assessments from the State and no assessments from other parties. To avoid confusion in referring to these assessments, the following table lists them, indicates when they were received, provides an identifier for the assessment that is used in the discussion of the assessments that follow, and identifies any distinguishing features of the modeling assessments.

Table 82. Modeling Assessments for the Putnam County Area

Assessment Submitted by	Date of the Assessment	Identifier Used in this TSD	Distinguishing or Otherwise Key Features
Florida	01/13/2017	Putnam County Modeling Report	Report
Florida	06/30/2016	Florida Modeling Protocol	Protocol

11.3.2. Modeling Analysis Provided by the State

The State of Florida submitted the modeling protocol to the EPA on June 30, 2016, for review. EPA had questions about the removal of receptors from the fenceline. The state indicated that they removed receptors from the background sources property. After a revision of the modeling protocol, Florida submitted a final modeling report to the EPA on January 13, 2017. The modeling conclusions did not change significantly. The final report from the State is primarily used in the TSD but details from the protocol or report maybe relevant.

11.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 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 current version of AERMOD, version 16216r, includes updates to 40 CFR part 51, Appendix W, "Guideline of Air Quality Models," published on January 17, 2017 (82 FR 5203). This version of AERMOD also includes fixes to bugs that were inadvertently included in version 16216.

At the time of modeling preparation, the latest version of AERMOD was not available, therefore the State used AERMOD version 15181 with regulatory default settings. A discussion of the State's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

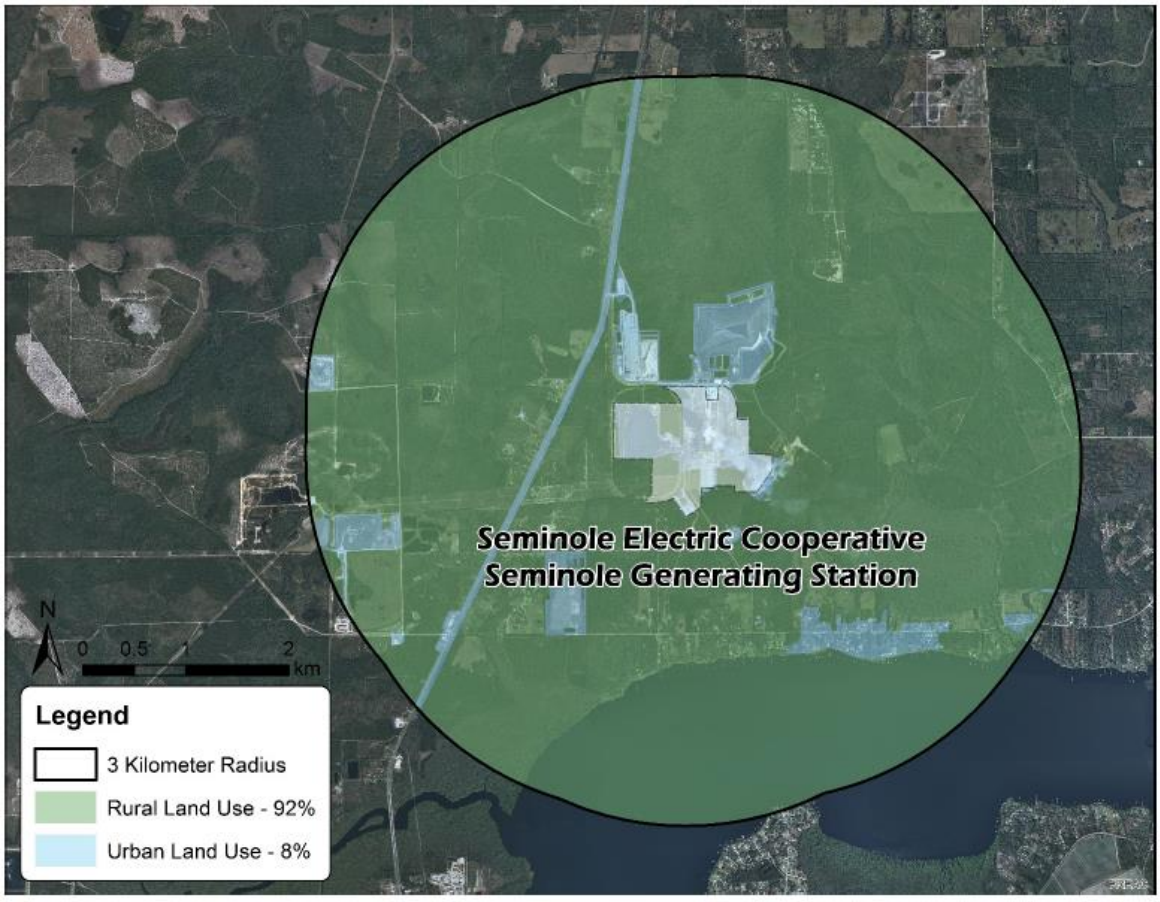
11.3.2.2. Modeling Parameter: Rural or Urban Dispersion

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 SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 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.

For the purpose of performing the modeling for the area of analysis, the State determined that it was most appropriate to run the model in rural mode.

The State used the Auer method since the method requires an analysis of the land use within a 3 km radius around a facility to determine whether the majority of the land is classified as rural or urban. If more than fifty percent of the area consists of Auer land-use industrial, commercial, or residential land types, then urban dispersion coefficients are used in the model. Rural land use constitutes a majority (92 percent) of the 3 km radius around SGS. Figure 88 depicts the land use representation of the Auer method.

Figure 88. Land use for the JEA NGS/SJRPP Facility. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



From the State's analysis on the land use, the EPA agrees with the use of the rural mode in AERMOD.

11.3.2.3. 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 SO_2 emission sources or facilities considered for modeling; the extent of concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions, SGS, subject to the DRR in this area is described in the introduction to this section. For the Putnam County area, the State has evaluated, for potential inclusion in the modeling, three other emitters of SO_2 within 35 km of Seminole Generating Station in any direction. The state determined that this was the appropriate distance to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis and any potential impact on SO_2 air quality from other sources in nearby areas. Based on this analysis, discussed in Section 11.3.2.4, only the Georgia Pacific Palatka Mill was explicitly modeled in addition to the Seminole Generating Station. Florida also assessed other SO_2 emissions sources in the Putnam County area. Table 83 provided in Florida's Modeling Report identifies the other sources that were considered for inclusion in the modeling analysis.

Table 83. SO_2 Emissions Sources within 35 km of the Seminole Generating Station. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Facility ID	Facility Name	Distance from SGS (km) (d)	20d	2014 SO_2 Emissions (tons) (Q)	Q > 20d
107-0025	Seminole Electric SGS Plant [a]	0	0	13,016.59	Yes
107-0039	Continental Palatka	1	20	0.56	No
107-0005	Georgia Pacific Palatka Mill [a]	7	140	630.85	Yes
109-0447	SAPA Extrusions St. Augustine	32	640	0.10	No

a. Explicitly modeled facility.

The EPA agrees with Florida's rationale for excluding the remaining SO_2 emissions sources based upon the fact that they have small amounts of emissions and/or are located large distances from the Seminole Generating Station.

No other sources beyond 35 km were determined by the State to have the potential to cause concentration gradient impacts within the area of analysis. The EPA believes that Florida's 35 km area of analysis is appropriate because there are no large sources of SO_2 emissions located beyond this distance that would be expected to have significant impacts in the area.

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

The State developed a uniform method for receptor grid placement for all DRR sources in Florida. Characterized by the State as a conservative approach, a dense grid of receptors was placed from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located was chosen) to the greater of 20 times the tallest stack height at the primary facility or 2,500 m. Receptor density then decreased in 2,500 m intervals. Receptors located within SGS's fenceline were removed and receptors were placed with 50 m spacing along the fenceline. The dense receptor grid has been described in Table 84.

Table 84. Seminole Generating Station Dense Receptor Grid Parameters. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.

Receptor Grid Parameter	Value/Description
Description of Unit at Grid Center	Boiler 1
Unit UTM Zone	17N
Unit UTM Easting (m)	438,836.85
Unit UTM Northing (m)	3,289,451.52
Actual Stack Height (m)	211.8
Expected Distance to Max Concentration (m)	2,118
20 Times Stack Height (m)	4,236
100 m Receptor Spacing - Extent from the Origin (m)	4,500
250 m Receptor Spacing - Extent from the Origin (m)	7,000
500 m Receptor Spacing - Extent from the Origin (m)	9,500
Plant Boundary Receptor Spacing (m)	50
Total Receptors	10,866

The receptor network contained 10,866 receptors, and the network covered the entirely of the Seminole Generating Station facility.

Figures 89 and 90, included in the State's recommendation, show the State's chosen area of analysis surrounding the Seminole Generating Station, as well as the receptor grid for the area of analysis.

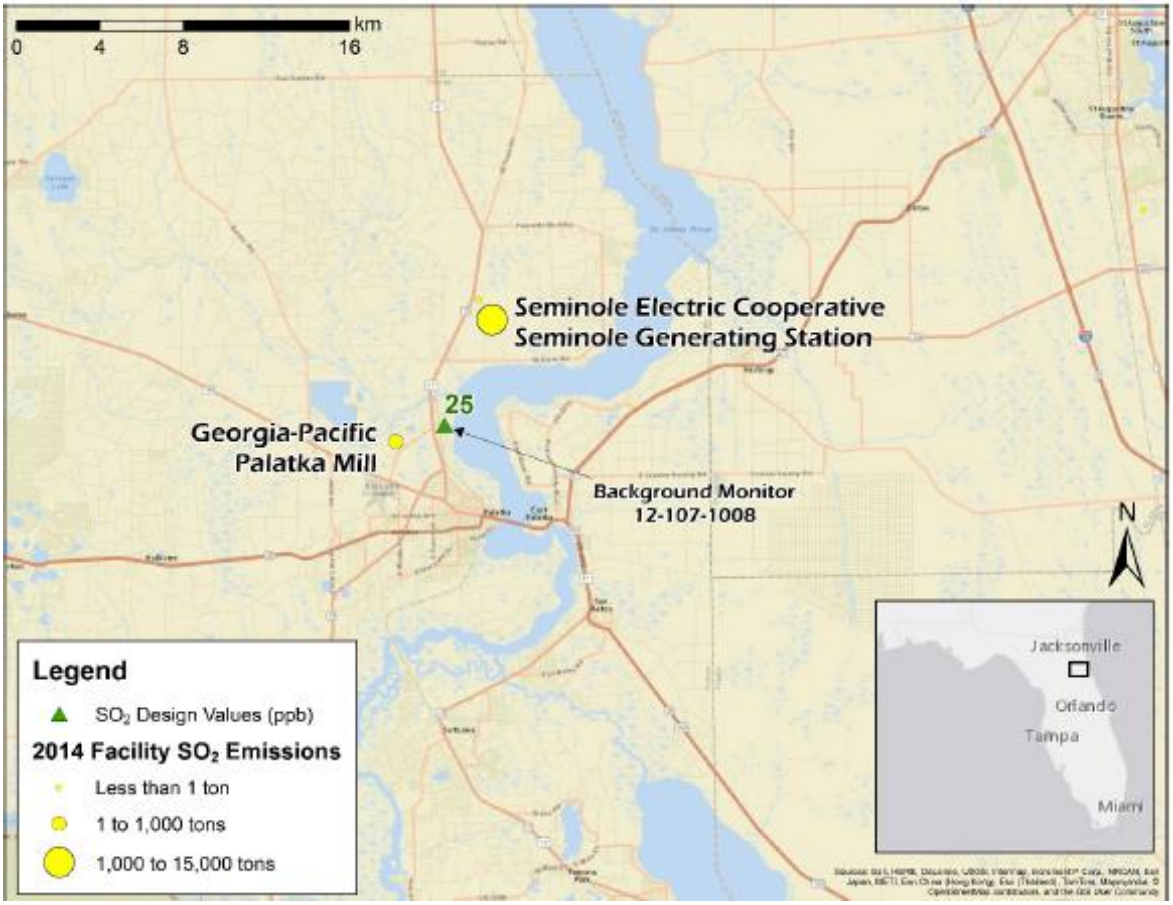
Consistent with the Modeling TAD, the State placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property.

Initial modeling indicated that high concentrations were found in an area of insufficiently dense receptor placement near Georgia Pacific. Accordingly, an additional nested grid of receptors with 100 m spacing was placed in this area to fully resolve the highest concentrations. The Modeling TAD describes in Section 4.2 a process for removing receptors placed in areas that it would not be feasible to place an actual monitor, such as bodies of water. Florida chose not to employ this process and instead included receptors in all areas the State considered ambient air within 9.5 km of SGS. Figure 90 from the Florida Modeling Report shows the SGS fence line boundary. However, no information was provided in Florida's Modeling Report for the Putnam County area to document that public access to the facility property is prevented by a fence or some other

physical barrier. The EPA contacted Florida regarding this issue. Florida responded via email[38] that they closely examined the fence line boundaries used in the modeling to ensure that public access is precluded from all areas that are being treated as non-ambient air. Hence, the EPA believes that Florida's decision to remove receptors from within the fence line boundaries is acceptable.

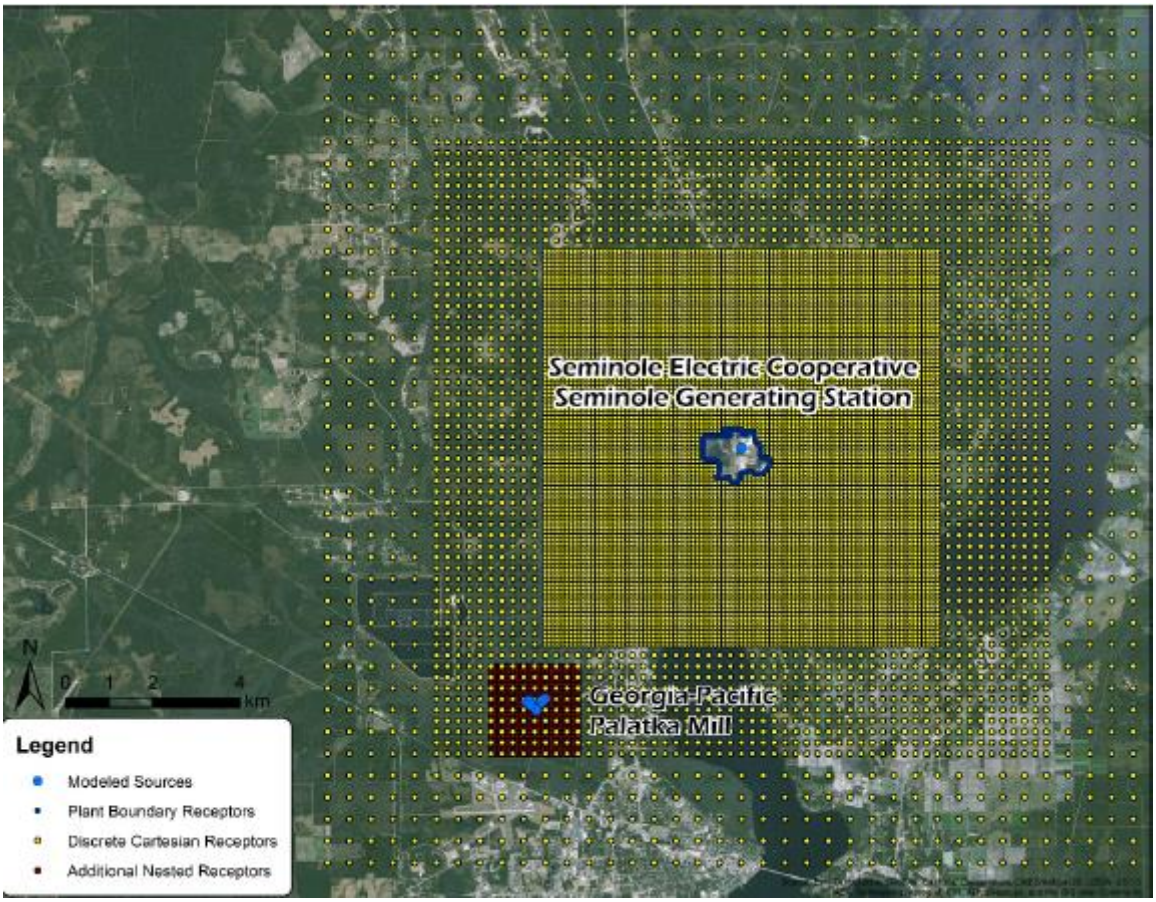
After review of all available information, the EPA believes that Florida's receptor grid is appropriate for the characterization of the area, considering the impact of SO_2 from the modeled facilities.

Figure 89. Area of Analysis for the Putnam County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



[38] Email dated August 9, 2017, from Brian Himes with Florida to Rick Gillam with the EPA.

Figure 90. Receptor Grid for the Putnam County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



11.3.2.4. 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.

In addition to the Seminole Generating Station the State evaluated nearby sources. Based on the Q/d analysis, only the Georgia Pacific Palatka Mill was explicitly modeled. The other sources evaluated have Q/d values less than 20.

The state characterized these 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 for sources modeled using actual emissions. The state properly followed the GEP Stack height policy for those sources modeled with PTE 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 BPIPPRM was used to assist in addressing building downwash.

The EPA agrees with Florida's method for characterizing the area and the assessment of nearby facilities modeled. The use of GEP stack height calculations is appropriate given the use of actual and allowable emissions. Building downwash is also appropriately accounted for.

11.3.2.5. 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 that has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 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 SO_2 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 SGS and one other emitter of SO_2 within 35 km in the area of analysis. For this area of analysis, the State has opted to use a hybrid approach, where emissions from all units modeled are expressed as PTE with the exception of two units at Georgia-Pacific Palatka which are expressed as actual emission rates. The facilities in the State's modeling analysis and their associated actual or PTE rates are summarized below.

For Georgia Pacific, the State provided annual actual SO_2 emissions between 2012 and 2014 for the two units modeled at actual emission rates. This information is summarized in Table 85 below. A description of how the State obtained hourly emission rates is given below this table.

Table 85. Actual SO_2 Emissions Between 2012 – 2014 from Facilities in the Area of Analysis for the Putnam County Area

Facility Name	SO_2 Emissions (tpy)		
	2012	2013	2014
Georgia-Pacific Palatka – No. 4 Combination Boiler and No. 4 Recovery Boiler	496	492	513
Total Emissions from All Facilities in the Area of Analysis Modeled Based on Actual Emissions	496	492	513

The tpy values shown in this table for Georgia Pacific includes actual emissions from two units at Georgia Pacific including the No. 4 Combination Boiler and the No. 4 Recovery Boiler. The actual emissions were determined through a combination of CEMS data and hourly fuel inputs with emission factors.

For Seminole Generating Station, all units were modeled at PTE. For Georgia Pacific Palatka, the State modeled PTE values for all units at the facility except for two units (actual emissions for these units are shown in the table above.) This information is summarized in Table 86 below. A description of how the State obtained hourly emission rates is given below this table.

Table 86. SO_2 Emissions based on PTE from Facilities in the Area of Analysis for the Putnam County Area

Facility Name	SO_2 Emissions (tpy, based on PTE)
Seminole Generating Station	23,372
Georgia Pacific Palatka	181
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	23,553

The PTE in tons per year for Seminole Generating Station was determined by the EPA based on multiplying the short-term PTE for all units by 8,760 hours in a year and dividing by 2,000 to convert to tons. The PTE in tons per year for Georgia Pacific was determined by the EPA based on multiplying the short-term PTE for all units except the No. 4 Combination Boiler and the No. 4 Recovery Boiler and multiplying by 8,760 hours in a year and dividing by 2,000 to convert to tons.

The SO_2 emission limits for the two primary boilers at the Seminole Generating Station are based on longer-term averaging periods (e.g., 30-day average limits) than the 1-hr SO_2 NAAQS. For these sources, Florida used the EPA guidance methodology to scale the longer-term average emission limit by the ratio of each source's historic 99th percentile one-hour average emission rate to its 99th percentile longer-term average emission rate. This analysis was performed by Florida using CEMS data from 2012 – 2014.

The EPA agrees with Florida's use of actual emissions for two emissions units at the Georgia Pacific Palatka facility, and use of permit allowable (PTE) emissions for remaining units at the

Georgia Pacific Palatka and Seminole Generating Station facilities. We believe that Florida has provided adequate documentation to show that these emissions for these sources we applied appropriately in the modeling.

11.3.2.6. Modeling Parameter: Meteorology and Surface Characteristics

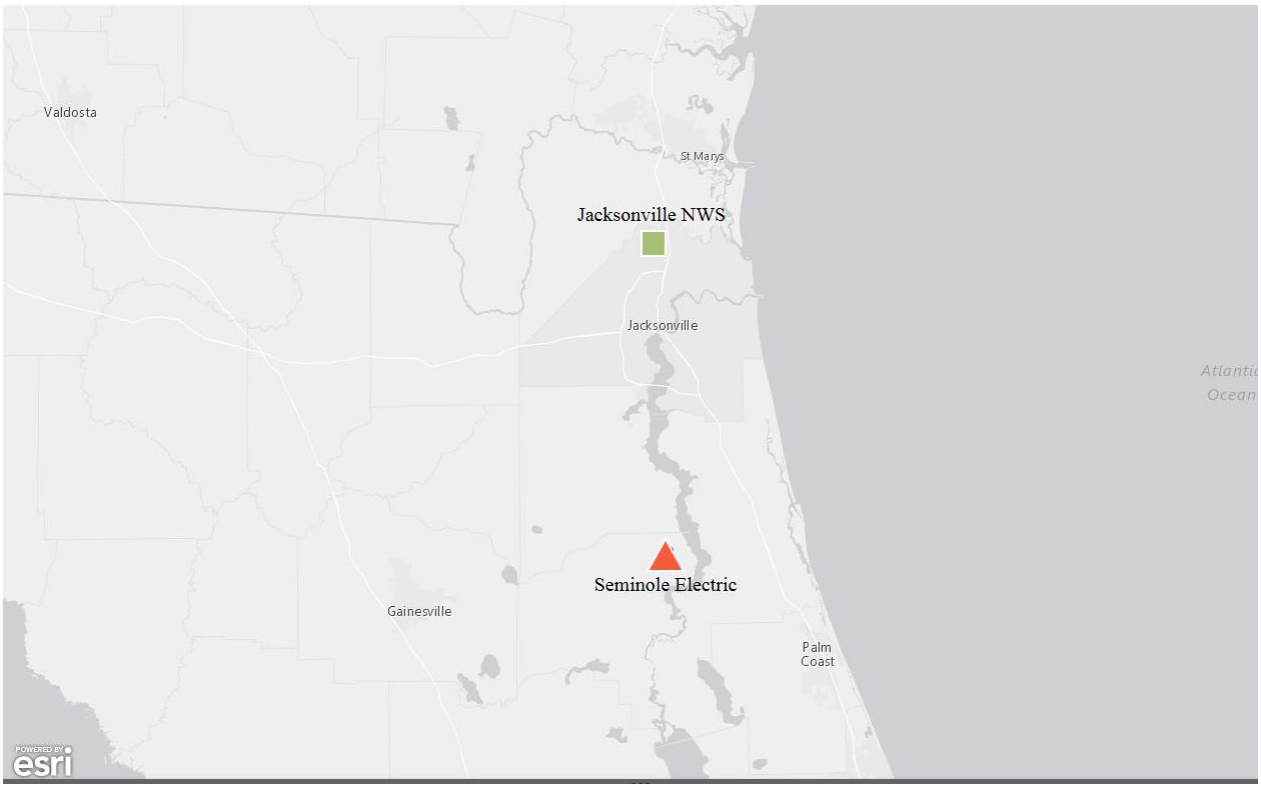
As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of 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 Putnam County area, the State selected the surface meteorology from Jacksonville International Airport located at latitude 30.5 degrees N and longitude 81.7 degrees W or approximately 85 km to the north of the Seminole Generating Station, and coincident upper air observations from the same NWS station as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 15181 using data from the Jacksonville International 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 "zo." The state estimated surface roughness values for 12 spatial sectors out to 1 km at an annual temporal resolution for dry, wet, or average conditions.

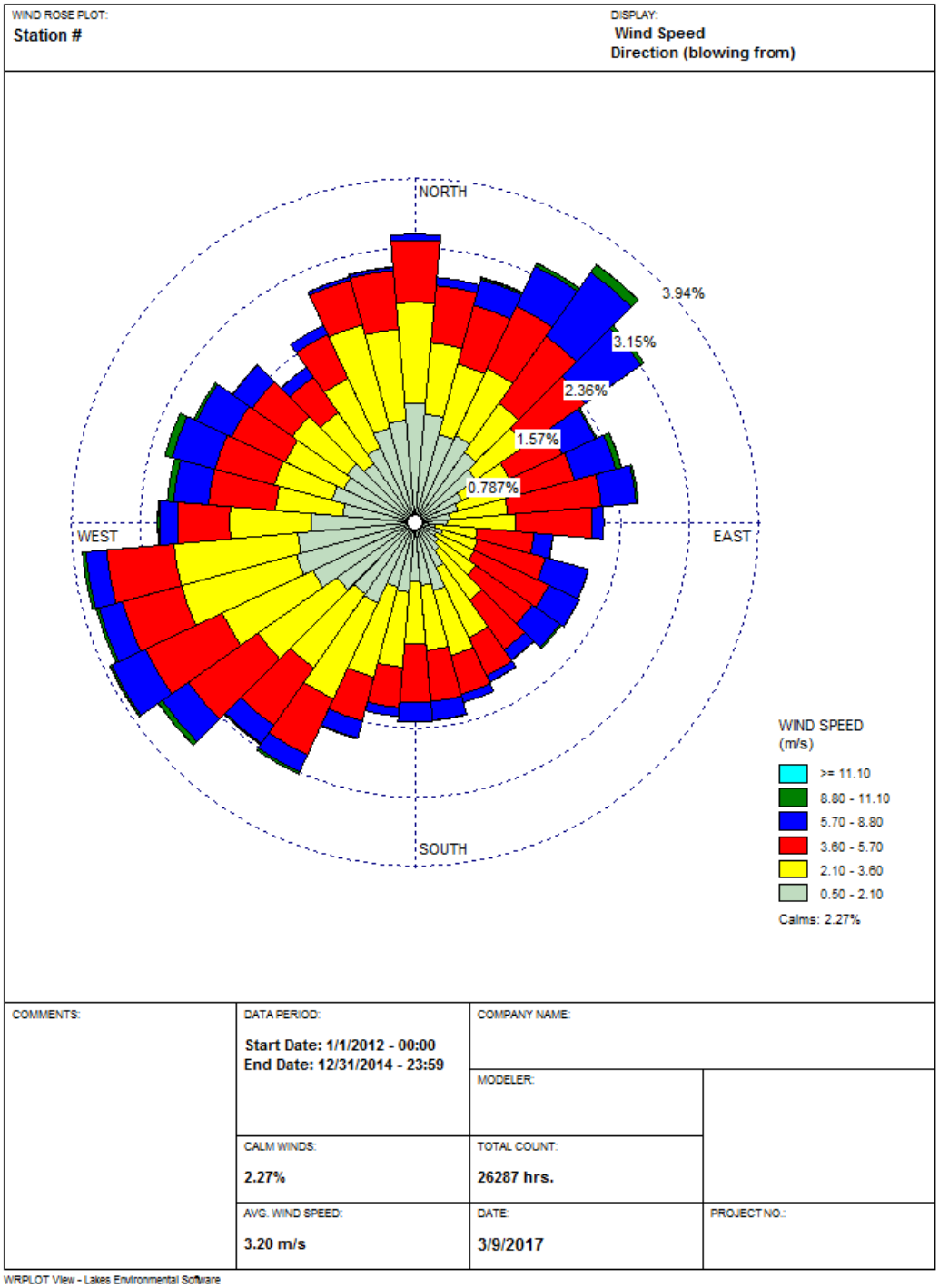
In the figure below, generated by the EPA, the location of this NWS station is shown relative to the area of analysis.

Figure 91. Area of Analysis and the NWS station in the Putnam County Area



The EPA generated a windrose for the Jacksonville International Airport for the 2012-14 period. In Figure 92, 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 predominately blow from the southwest, west, northwest, north and northeast directions.

Figure 92. Jacksonville International Airport 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 the SO_2 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 Jacksonville, Florida, 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 m/s 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 believes the meteorology and surface characteristics used in the State's modeling are acceptable. The meteorology in the final modeling report made use of the surface meteorology from Jacksonville International Airport located approximately 85 km to the north of the Seminole Generating Station, and coincident upper air observations from the same NWS station as best representative of meteorological conditions within the area of analysis. The EPA believes that the meteorological data reasonably shows that impacts from Seminole Generating Station can be expected to the northwest of the facility. The surface characteristics were properly evaluated using AERSURFACE at the Jacksonville International Airport location. Florida complied with the EPA guidance in developing this aspect of its modeling parameters.

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

The terrain in the area of analysis is best described as generally flat. To account for these minor 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.

While Putnam County, Florida, is generally flat, the State nevertheless used the AERMAP terrain program to ensure any terrain changes were accounted for. The EPA agrees that this approach is acceptable.

11.3.2.8. Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 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 chose a tier 2 approach using data from the FAMAS monitoring site [12-107-1008] located about 5.5 km southwest of the Seminole Generating Station. The state generated hourly background values by season but excluded concentrations during hours with wind directions between 341 and 70 degrees to avoid double counting of impacts from sources explicitly modeled. The background concentrations for this area of analysis were determined by the State to vary from 1 μg/m^3, equivalent to .33 ppb when expressed in 2 significant figures,[39] to 27 μg/m^3 (10 ppb). 2012-14 background values are shown in the table below:

Table 87. Background SO_2 Concentrations for the FAMAS Monitor site [12-107-1008] - ppb

Hour	Winter	Spring	Summer	Autumn	Hour	Winter	Spring	Summer	Autumn
0:00	2.00	1.00	1.00	0.67	12:00	4.67	9.00	3.33	4.33
1:00	2.00	1.00	1.33	0.33	13:00	7.00	5.67	4.00	5.33
2:00	1.67	1.00	1.00	0.33	14:00	7.67	4.33	3.33	4.33
3:00	2.33	0.67	1.33	0.33	15:00	7.33	3.00	4.67	2.67
4:00	2.67	1.33	1.00	0.33	16:00	4.33	3.33	4.00	1.00
5:00	1.67	1.33	1.67	0.33	17:00	2.33	0.67	2.00	0.67
6:00	2.00	1.33	1.67	0.67	18:00	2.33	1.33	1.33	1.00
7:00	1.67	1.67	1.67	0.67	19:00	1.33	1.33	1.67	1.00
8:00	2.00	1.67	1.67	0.33	20:00	1.33	1.00	1.00	0.67
9:00	1.67	1.67	2.33	1.00	21:00	1.33	1.00	1.33	0.33
10:00	2.33	5.33	5.00	2.33	22:00	1.33	0.33	2.00	0.67
11:00	3.33	10.33	6.00	4.67	23:00	1.00	0.33	2.33	0.33

The EPA agrees that Florida has appropriately chosen the background concentrations in accordance with the Modeling TAD. The State has chosen a monitor that is near the modeled source and is adequate for modeling purposes, with complete data for the 2012-2014 time period. The EPA believes that the chosen background monitored concentration is representative of the area.

[39] The SO_2 NAAQS level is expressed in ppb but AERMOD gives results in μg/m^3. The conversion factor for SO_2 (at the standard conditions applied in the ambient SO_2 reference method) is 1ppb = approximately 2.619 μg/m^3.

11.3.2.9. Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Putnam County area of analysis are summarized below in Table 88.

Table 88. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Putnam County Area

Input Parameter	Value
AERMOD Version	15181 (regulatory options)
Dispersion Characteristics	Rural
Modeled Sources	2
Modeled Stacks	12
Modeled Structures	39
Modeled Fencelines	1
Total receptors	10,866
Emissions Type	Mixed/Hybrid
Emissions Years	2012-2014 PTE's currently in effect for sources modeled with PTE
Meteorology Years	2012-14
NWS Station for Surface Meteorology	Jacksonville, Florida
NWS Station Upper Air Meteorology	Jacksonville, Florida
NWS Station for Calculating Surface Characteristics	Jacksonville, Florida
Methodology for Calculating Background SO_2 Concentration	Tier 2 - temporally varying approach by hour and season
Calculated Background SO_2 Concentration	1 $\mu g/m^3$ to 27 $\mu g/m^3$

The results presented below in Table 89 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.

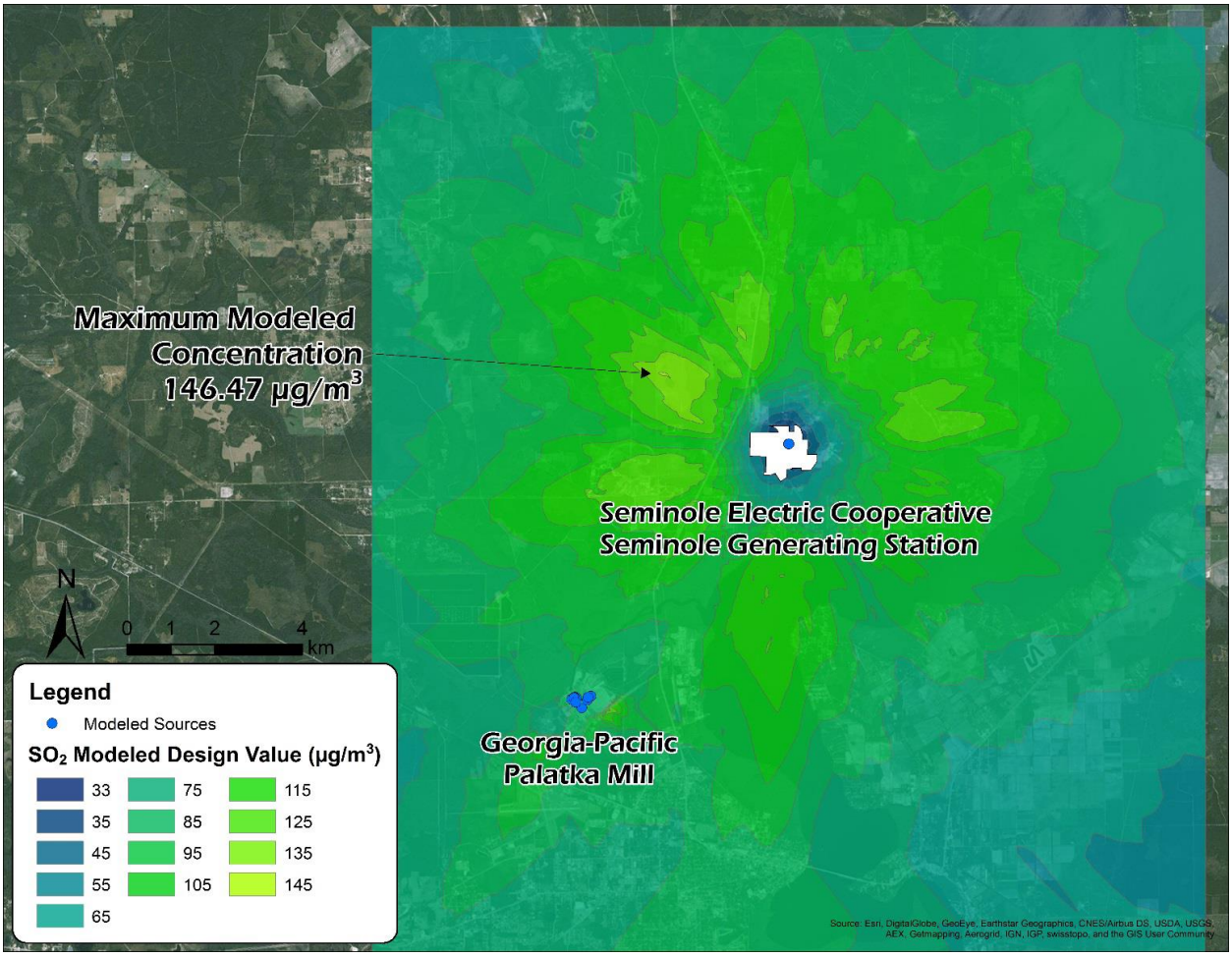
Table 89. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Putnam County Area

Averaging Period	Data Period	Receptor Location		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM Easting (m)	UTM Northing (m)	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2012-2014	435,936.8	3,291,051.5	146.47	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The State's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 146.47 $\mu g/m^3$, equivalent to 56 ppb. This modeled concentration included the background concentration of SO_2, and is based on a mixture of actual and PTE emissions from the facilities. Figure 93 below was included as part of the State's recommendation, and indicates that the predicted value occurred just northwest of the Seminole Generating Station. The State's receptor grid is also shown in the figure.

Figure 93. Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentrations Averaged Over Three Years for the Area of Analysis for the Putnam County Area. Source: Data Requirements Rule Submittal, provided by the Florida Department of Environmental Protection, January 13, 2017.



The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Additionally, based on the available information for the remaining areas in Florida, including monitoring and modeling, there are no current SO_2 nonattainment areas near Putnam County, Florida, and no expected nonattainment areas for this third round of designations. Therefore, the Putnam County area is not expected to contribute to ambient air quality in a nearby area that does not meet the NAAQS.

11.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The EPA agrees that Florida has appropriately characterized the area surrounding the Seminole Generating Station. Given the criteria for selecting nearby sources, we believe that the decision to include one additional facility (Georgia Pacific Palatka Mill), and excluding all other sources from the modeling analysis was correct. Permitted allowable emissions were used for the Seminole Generating Station and some of the sources at the Georgia Pacific Palatka Mill. Actual emissions from the 2012-14 period were used for two boilers at the Palatka Mill. The EPA agrees that Florida's approach provides for an appropriate assessment of SO_2 concentrations in the area. All other nearby sources not included in the modeling were accounted for in the background concentrations used in the modeling. With regards to the background concentrations, the State chose the nearest monitor with valid data for the 2012-2014 time period. The EPA agrees with the monitor chosen for background concentrations. The EPA also agrees that the surface and upper air meteorological data used in this analysis is appropriate for performing a valid modeling assessment. The modeling submitted by the State does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration. Based upon a thorough evaluation of the information provided by Florida, the EPA believes there are no modeled violations of the 1-hour SO_2 NAAQS in ambient air locations near the Seminole Generating Station. Additionally, the EPA believes that Seminole Generating Stations is not contributing to any violations of the 1-hour SO_2 NAAQS.

11.4. Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Putnam 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.

11.5. Jurisdictional Boundaries in the Putnam County Area

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for Putnam County. This factor did not play a significant role in the EPA's analysis.

11.6. Other Information Relevant to the Designations for the Putnam County Area

In its January 13, 2017, submission, Florida provided information regarding reductions in SO_2 emissions from the sources in Putnam County. The State expects that the ambient concentrations and emissions of SO_2 in Putnam County will continue to fall as they have for at least the past decade. 2015 emissions of SO_2 at SGS were 22 percent less than in 2014. The State anticipates that the implementation of a variety of national rules and regulations (particularly the Mercury and Air Toxics Standard) and economic forcing will result in the maintenance or even further reduction of these lower levels of SO_2 emissions, ensuring continued compliance with the NAAQS.

11.7. The EPA's Assessment of the Available Information for the Putnam County Area

The EPA has reached the conclusion that there is no NAAQS violation based on the modeling results submitted by Florida. Additionally, the EPA believes that Seminole Generating Stations is not contributing to any violations of the 1-hour SO2 NAAQS.

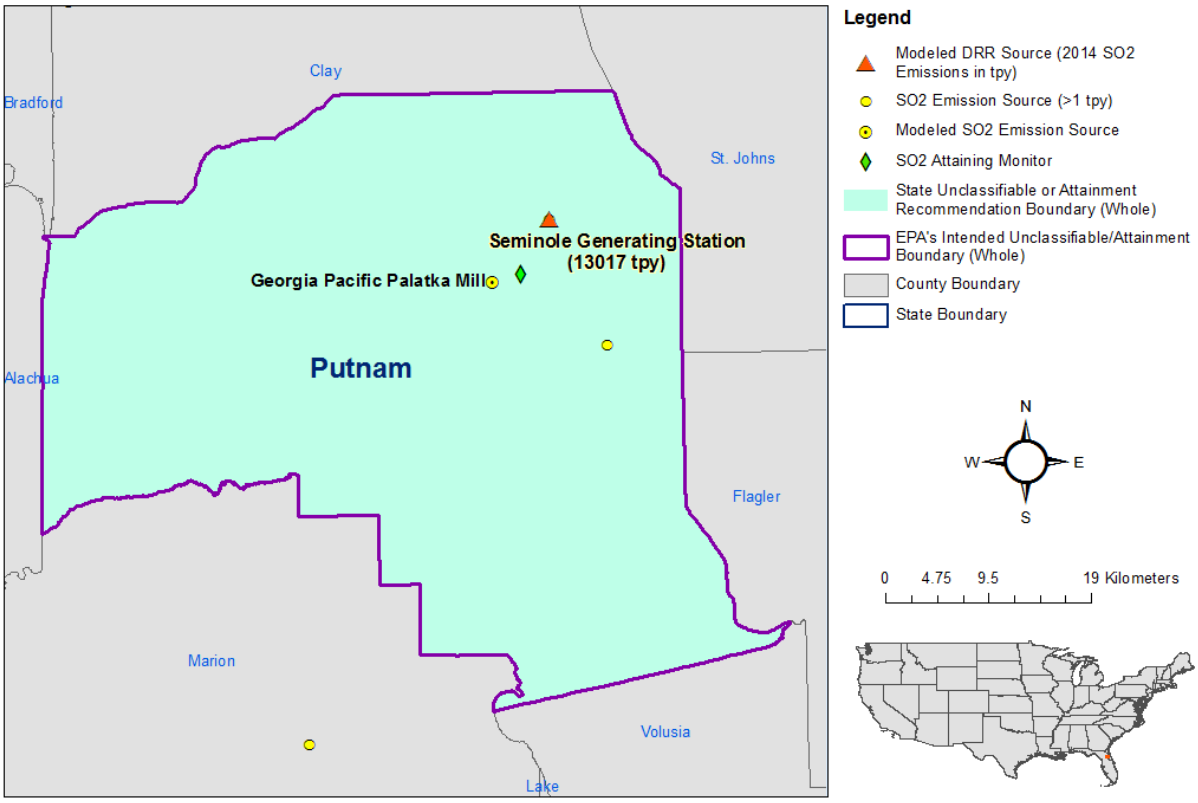
The EPA believes that our intended unclassifiable/attainment area, bounded by Putnam County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

11.8. Summary of Our Intended Designation for the Putnam 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 Putnam County, Florida, area as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundary is comprised of Putnam County (in its entirety.) Although the State recommended that the area surrounding the Seminole Generating Station facility be designated "attainment" or "unclassifiable," the EPA's intended whole county boundary is consistent with the approach used in prior designations for counties with no monitored or modeled violation.

Figure 94 shows the boundary of this intended designated area.

Figure 94. Boundary of the Intended Putnam County Unclassifiable/Attainment Area



12. Technical Analysis for All Remaining Areas in Florida

12.1. Introduction

The State has not installed and begun timely operation of a new, approved SO_2 monitoring network meeting the EPA specifications referenced in the EPA's SO_2 DRR for any sources of SO_2 emissions the counties in the counties in Table 90. Accordingly, the EPA must designate these counties by December 31, 2017. At this time, there are no air quality modeling results available to the EPA for these counties. In addition, there is no air quality monitoring data that indicate any violation of the 1-hour SO_2 NAAQS. The EPA is designating the counties in Table 90 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 90. Intended Designations for All Remaining Areas in Florida

County	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Alachua County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Baker County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Bradford County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Brevard County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Broward County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Calhoun County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Charlotte County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Citrus County	None	Attainment or Unclassifiable	Citrus County, Florida (p)	Unclassifiable/ Attainment
Clay County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Collier County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Columbia County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
DeSoto County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment

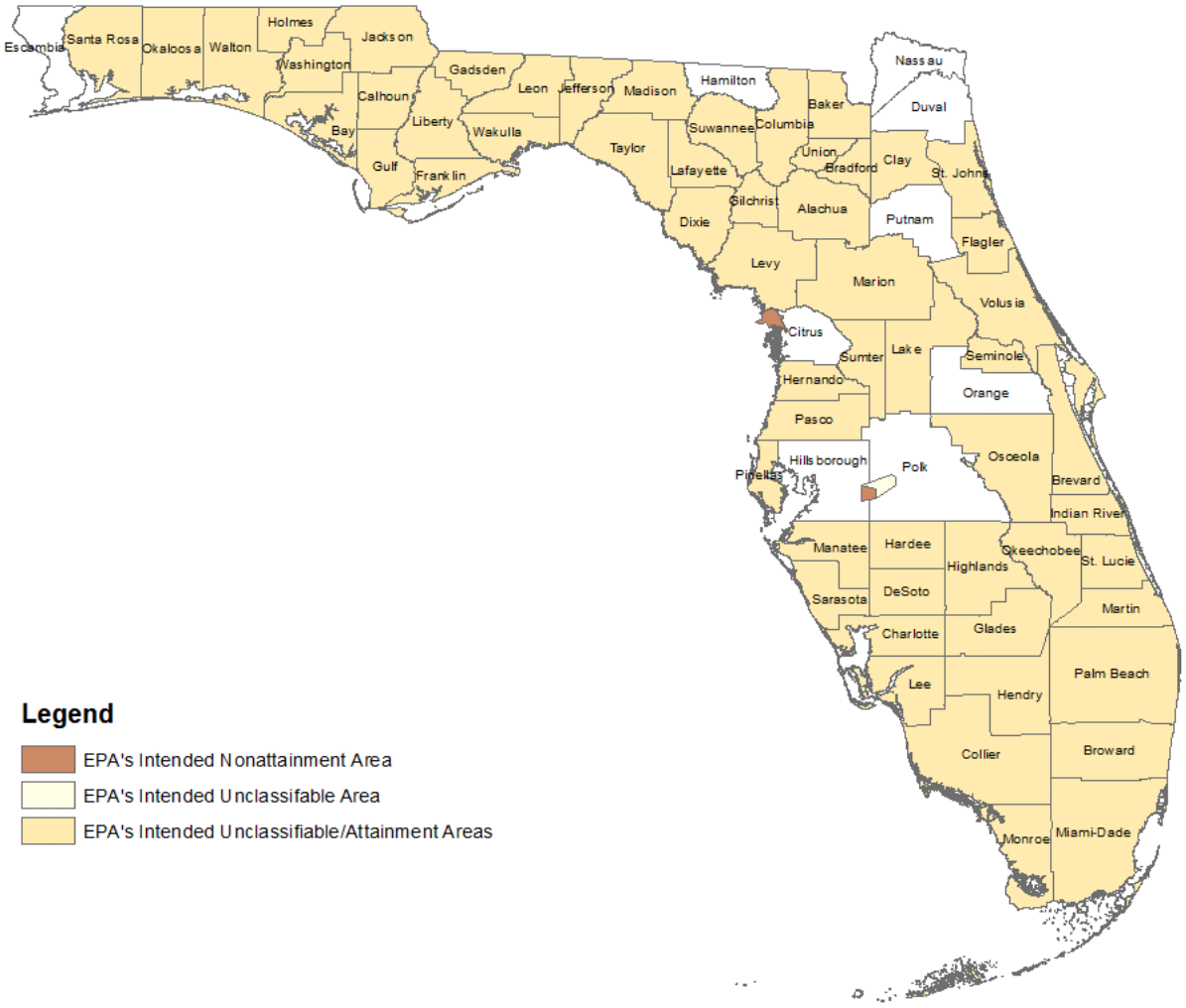
County	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Dixie County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Flagler County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Franklin County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Gadsden County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Gilchrist County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Glades County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Gulf County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Hardee County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Hendry County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Hernando County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Highlands County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Hillsborough County	None	Attainment or Unclassifiable	Hillsborough County, Florida (p)	Unclassifiable/ Attainment
Holmes County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Indian River County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Jackson County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Jefferson County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Lafayette County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Lake County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Lee County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Leon County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Levy County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment

County	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Liberty County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Madison County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Manatee County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Marion County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Martin County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Miami-Dade County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Monroe County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Nassau County	None	Attainment or Unclassifiable	Nassau County, Florida (p)	Unclassifiable/ Attainment
Okaloosa County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Okeechobee County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Osceola County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Palm Beach County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Pasco County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Pinellas County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Polk County	None	Attainment or Unclassifiable	Polk County, Florida (p)	Unclassifiable/ Attainment
St. Johns County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
St. Lucie County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Santa Rosa County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Sarasota County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Seminole County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Sumter County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment

County	Florida's Recommended Area Definition	Florida's Recommended Designation	The EPA's Intended Area Definition	The EPA's Intended Designation
Suwannee County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Taylor County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Union County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Volusia County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Wakulla County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Walton County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment
Washington County	None	Attainment or Unclassifiable	Rest of State	Unclassifiable/ Attainment

Table 90 also summarizes Florida's recommendations for these areas. Specifically, the State recommended that the entire State of Florida be designated as "attainment" or "unclassifiable," with the exception of the two existing nonattainment areas in Hillsborough and Nassau Counties. After careful review of the State's assessment, supporting documentation, and all available data, the EPA, with the exception of portions of Citrus, Hillsborough, and Polk Counties discussed earlier, intends to designate the areas as unclassifiable/attainment. Figure 95 shows the locations of these areas within Florida. 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 95. The EPA's Intended Unclassifiable/Attainment Designation(s) for Counties in Florida.



12.2. Air Quality Monitoring Data for All Remaining Areas in Florida

AQS monitors located in Broward, Manatee, Miami-Dade, and Pinellas Counties have sufficient valid data for 2014-2016 and these data indicate that there was no violation of the 2010 SO_2 NAAQS at the monitoring sites in that period; however, there is no available information that the monitors are located in maximum concentrations of SO_2 in each respective area. The most recent SO_2 design values for all areas of the country are available at https://www.epa.gov/air-trends/air-quality-design-values. The design values for these other counties are summarized in the table below.

Table 91. SO_2 Monitoring Data for All Other Counties

County	AQS Monitor ID	Monitor Location	2014-2016 SO_2 Design Value (ppb)
Broward	12-011-0010	26.128611, -80.167222	4
Manatee	12-081-0028	27.6389, -82.4545	10
Miami-Dade	12-086-0019	25.8995, -80.38259	1
Pinellas	12-103-0023	27.86363, -82.62315	7
Pinellas	12-103-5003	28.14167, -82.73972	4

12.3. Jurisdictional Boundaries in All Remaining Areas in Florida

Florida did not provide any jurisdictional information that the EPA used in the intended designation action for these counties. This factor did not play a significant role in the EPA's analysis.

12.4. The EPA's Assessment of the Available Information for All Remaining Areas in Florida

These areas 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 areas 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. It is important to note that a portion of the EPA's intended unclassifiable/attainment boundary for the rest of the State includes Miccosukee Tribe of Indians of Florida and Seminole Tribe of Florida trust lands.

12.5. Summary of Our Intended Designation for All Remaining Areas in Florida

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate the areas in the above Table 90 as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundaries are generally comprised of county boundaries.

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