Pirkey Power Plant and Martin Lake Steam Electric Station

Harrison and Tatum Counties, Texas

Evaluation of Compliance with the 1-hour NAAQS for SO_2

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Conducted by:

Steven Klafka, P.E., BCEE

Wingra Engineering, S.C.

Madison, Wisconsin

1. Introduction

Wingra Engineering, S.C. was hired by the Sierra Club to conduct an air modeling impact analysis to identify and confirm that certain large emission sources are likely causing exceedences of the 1-hour sulfur dioxide (SO_2) national ambient air quality standard (NAAQS). This document describes the results and procedures for an updated evaluation of whether emissions from Henry W. Pirkey Plant near Hallsville, Texas, contribute to exceedances of the NAAQS in the nearby nonattainment area around Martin Lake Steam Electric Station located in Tatum, Texas. This document describes the results and procedures for evaluating the extent and concentration of SO_2 impacts due to both power plants.

The dispersion modeling analysis predicted ambient air concentrations for comparison with the 1-hour SO_2 NAAQS. The modeling was performed using the most recent version of AERMOD, AERMET, and AERMINUTE, with data provided to the Sierra Club by regulatory air agencies and through other publicly-available sources as documented below. The analysis was conducted in adherence to all available USEPA guidance for evaluating source impacts on attainment of the 1-hour SO_2 NAAQS via aerial dispersion modeling, including the AERMOD Implementation Guide; USEPA's Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010; modeling guidance promulgated by USEPA in Appendix W to 40 CFR Part 51; USEPA's March 2011 Modeling Guidance for SO_2 NAAQS Designations;[1] and, USEPA's August 2016 SO_2 NAAQS Designations Technical Assistance Document.[2]

To improve the accuracy of this modeling analysis, it incorporates the following procedures:

a) The most current versions of the AERMOD modeling system v. 19191 were used for the analysis.

b) Actual hourly emission rates for both power plants were used for the modeling analysis. Because emission rates from the facility's continuous emissions monitoring system (CEM) were not publicly available, this report relies on hourly emissions data from EPA's *Clean Air Markets Program Database (CAMD)* for the 2017-19 period.[3]

c) Stack parameters including location, height, diameter and temperature for the Martin Lake plant were obtained from the March 2016 report, *Characterization of 1-Hour SO_2 Concentrations in the Vicinity of the Martin Lake Steam Electric Station*, prepared by AECOM for Luminant Generation Company LLC, the owner and operator of the Martin Lake power plant.

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[1] http://www.epa.gov/scram001/so2_modeling_guidance.htm
[2] https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf
[3] http://ampd.epa.gov/ampd/

d) Stack parameters including location, height, diameter and temperature for the Pirkey plant were obtained from the annual survey compiled by the U.S. Energy Information Administration.[4] Stack locations were verified using aerial photographs.

e) Since actual hourly SO_2 emissions were used for the modeling analysis, hourly stack exit velocities and temperatures were also employed. This approach is recommended by USEPA and has been used for prior modeling analyses to determine compliance with the NAAQS. [5] Actual hourly stack flow rates, exit velocities and temperatures from the facility CEM for both power plants were not publicly available. These were instead estimated based on available information.

f) To derive stack exit temperatures for the Martin Lake plant, the actual hourly emission rates, stack temperatures and stack exit velocities for the 2013-2015 period were obtained from the station continuous emissions monitoring (CEM) system, as reported by AECOM. This report used AECOM's hourly CEM temperature measurements during 2013-15 to derive an average stack outlet temperature for each of the three units. This report then assumes this average temperature for modeling the 2017-19 period. These average temperatures were 352, 358 and 355 °K, respectively.

g) To derive the stack exit velocities for the Martin Lake plant, the following steps were used: Step 1) exit velocities for 2013-15 from CEM measurements were combined with concurrent heat input obtained from the USEPA Air Markets Program Data to derive a relationship between exhaust gas flow rate and heat input for the three units. Step 2) The resulting value of 16,359 standard cubic feet per mmbtu heat input was applied to the hourly heat input for each unit from the USEPA Air Markets Program Data during the 2017-19 period to determine hourly exit velocities during 2017-19. Since the flow rate was based on standard cubic feet, the temperature for each stack was used to increase the flow from standard to actual conditions.

h) To derive the stack exit temperatures for the Pirkey plant, stack exit temperatures at 100% and 50% load were provided by the USEIA annual power plant survey. For Unit 1, these temperatures were: 287 and 149 ºF. All loads below 50% were assumed to have the same temperature as 50% load. Between 50% and 100% load, the temperature was assumed to increase proportionally with load. The % load for each hour was calculated from the heat input provided in the USEPA CAMD.

i) To derive the stack exit velocities for the Pirkey plant, the following steps were used: Step1) hourly heat input and exhaust flow rates provided by USEPA for 2012-14 period in its

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[4] http://www.eia.gov/electricity/data/eia860/

[5] USEPA, SO2 NAAQS Designations Modeling Technical Assistance Document, August 2016 (Draft).

Emissions Modeling Clearinghouse were used to calculate a standard cubic feet (scf) per mmbtu ratio. For Unit 1, the calculated ratio was 21,953. Step 2) This flow to heat input ratio was applied to the hourly heat input for the 2017-19 period provided by the USEPA CAMD to determine the hourly flow rates. Step 3) The temperature calculated for each hour was applied to the flow rate in standard cubic feet for each hour to determine the flow rate in actual cubic feet.

j) The downwash effects of nearby buildings and structures were used for the modeling analysis. For the Martin Lake plant, building locations and dimensions were taken from the supporting modeling files for the AECOM report. For the Pirkey plant, photographs show the boiler stack is relatively short and likely affected by downwash effects from nearby buildings and structures. No building dimensions were publicly available. To incorporate downwash effects, these dimensions were estimated using aerial and facility photographs.

k) Concurrent meteorology for the 2017-19 period were used for the modeling analysis. These were processed using the current version of AERMET following similar procedures used by TCEQ for the meteorology data it provides for modeling analyses. Consistent with prior modeling analyses for the Martin Lake plant, the surface meteorology was obtained from the Longview Texas Regional Airport and surface meteorology was obtained from Shreveport, Louisiana.

l) The background SO_2 concentration used for the modeling analysis is the lowest design value for the 2017-19 period from all ambient monitors in Texas. This is the concentration of 1.8 ppb or 4.7 $\mu g/m^3$ which was measured at the Milam County monitor identified as the Rockdale John D. Harper Road Monitor located at 3990 John D Harper Road (Coordinates: 30.569534, -97.076294). It has USEPA ID #483311075.

m) An ambient monitor for SO_2 began operation on November 1, 2017 approximately 1.9 kilometers north of the station in Martin Creek Lake State Park.[6] It is identified as the Longview-Marshall monitor with USEPA ID #484011082. This monitor is located in an area that is affected by emissions from the Martin Lake plant so this report does not rely on that monitor to obtain a background concentration.

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[6] https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.view_site&siteAQS=484011082

2. Compliance with the 1-hour SO_2 NAAQS

2.1 1-hour SO_2 NAAQS

The 1-hour SO_2 NAAQS takes the form of a three-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations, which cannot exceed 75 parts per billion (ppb).[7] Compliance with this standard was verified using USEPA's AERMOD air dispersion model, which produces air concentrations in units of $\mu g/m^3$. The 1-hour SO_2 NAAQS of 75 ppb equals 196.2 $\mu g/m^3$, and this is the value used for determining whether modeled impacts exceed the NAAQS.[8] The 99th percentile of the annual distribution of daily maximum 1-hour concentrations corresponds to the fourth-highest value at each receptor for a given year.

2.2 Modeling Results

Modeling results are summarized in Table 1.

Table 1 - SO_2 Modeling Results for Pirkey and Martin Lake Power Plants

Emission Rates	Facility	99th Percentile 1-hour Daily Maximum ($\mu g/m^3$)				Complies with NAAQS?
		Impact	Background	Total	NAAQS	
Actual 2017-19	Pirkey	23.6	4.7	28.3	196.2	Yes
Actual 2017-19	Martin Lake	301.4	4.7	306.1	196.2	No
Actual 2017-19	Both	301.5	4.7	306.2	196.2	No

Figure 1 shows the full extent of predicted exceedances of the 1-hour NAAQS for SO_2 and the locations of the Martin Lake and Pirkey plants

Figure 2 shows the highest predicted exceedances close to Martin Lake plant. The location of the nearby Longview-Marshall ambient monitor is shown.

Figure 3 shows the predicted contribution from the Pirkey power plant, by itself, to the area surrounding the Martin Lake plant.

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[7] USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010.

[8] The ppb to $\mu g/m^3$ conversion is found in the source code to AERMOD v. 19191, subroutine Modules. The conversion calculation at 25 °C is 75/0.3823 = 196.2 $\mu g/m^3$. This conversion has been used for consistency with prior modeling reports. While USEPA has recently converted the 75 ppb standard to 196.5 $\mu g/m^3$, the alternative USEPA concentration does not change the conclusions of this report.

The maximum impact due to emissions from both plants is primarily due to SO_2 emissions from the Martin Lake plant. However, the Pirkey plant has a peak impact of 6.7 $\mu g/m^3$ at the location of this maximum impact. As reflected in Figure 2, those maximum impacts occur to the south and west of the Martin Lake plant. The Pirkey plant has a peak impact of 8.2 $\mu g/m^3$ at the location of the Martin Lake monitoring station, which, as noted, is approximately 1.9 km to the north of Martin Lake.

Figure 4 provides a wind rose for the 2017-19 meteorological data used for the modeling analysis. Wind directions from approximately 5 to 45 degrees direct emissions from the Pirkey plant to the vicinity of the Martin Lake plant. These occur approximately 6.1% of the time.

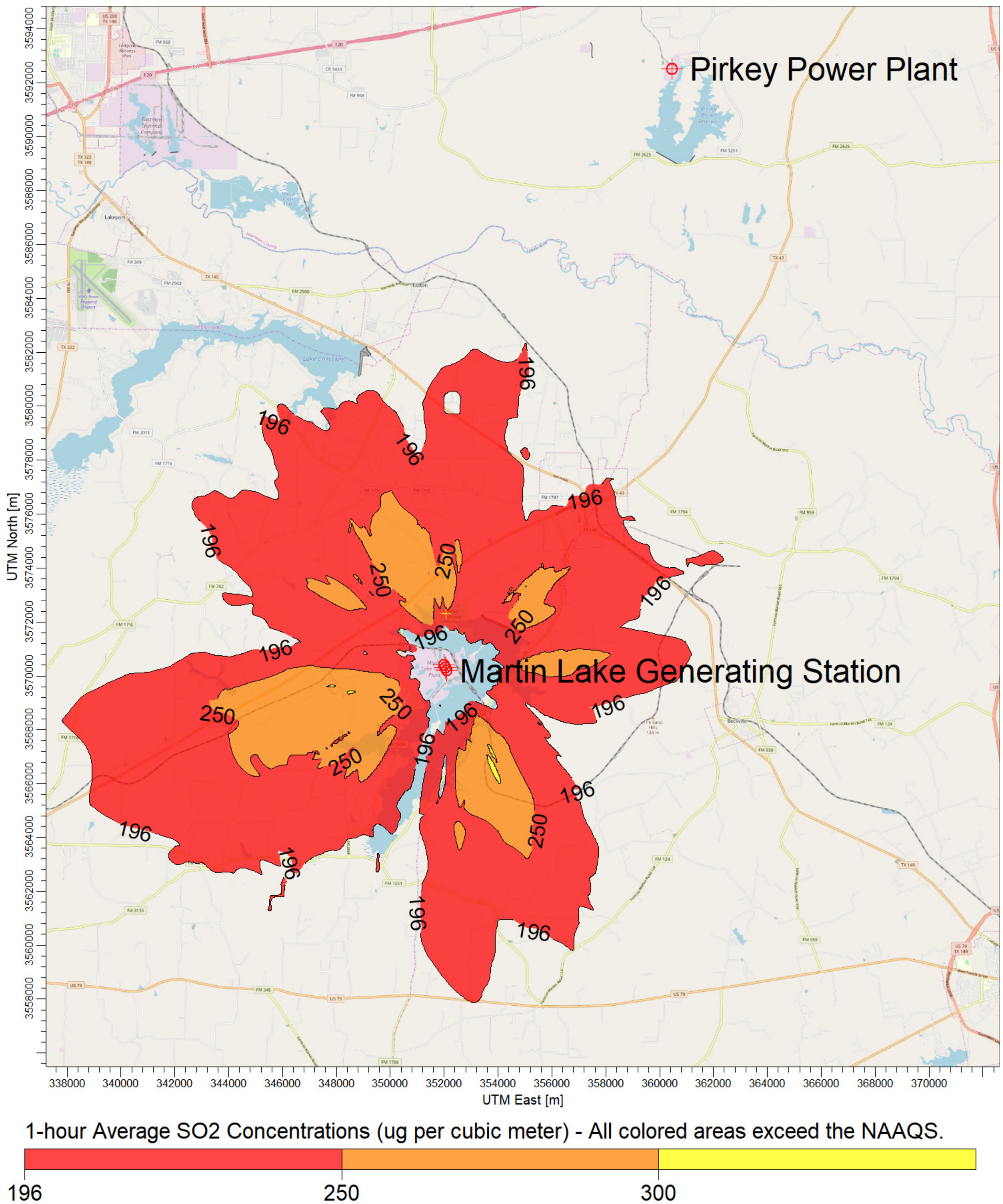

Figure 1 - Regional View of NAAQS Exceedances for 2017-19 Period

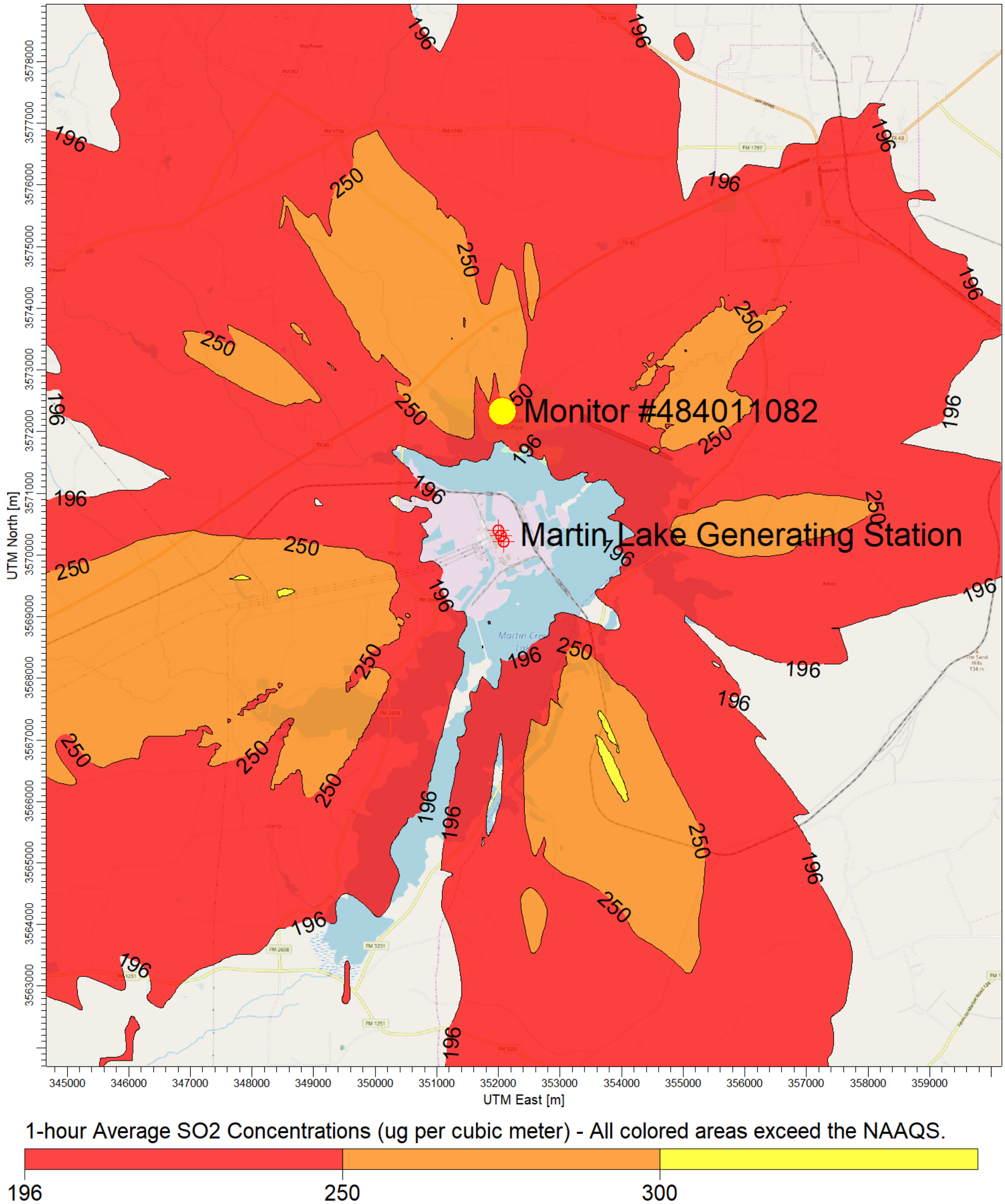

Figure 2 – Close-up View of NAAQS Exceedances for 2017-19 Period

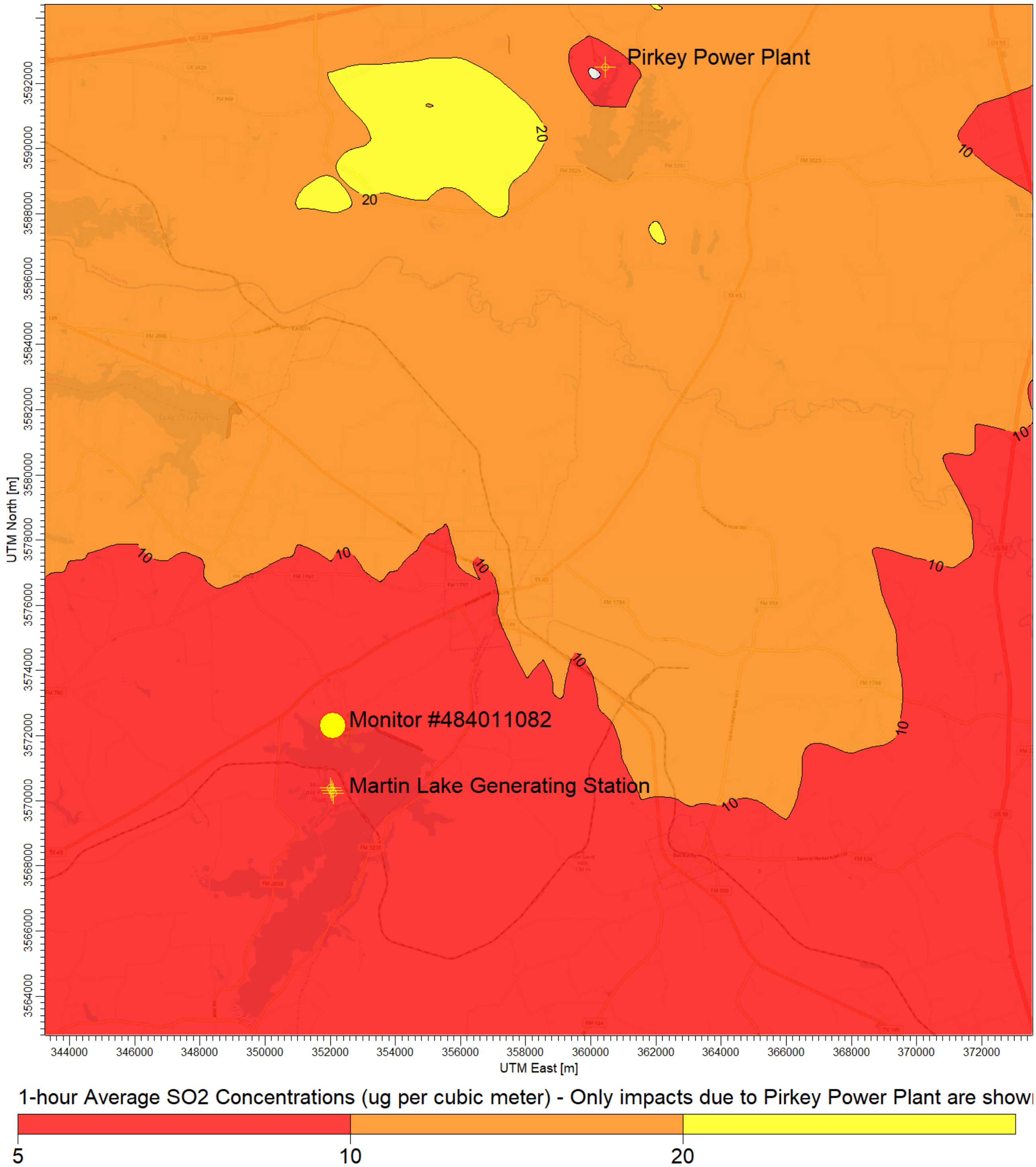

Figure 3 - Impacts of Pirkey Power Plant Alone

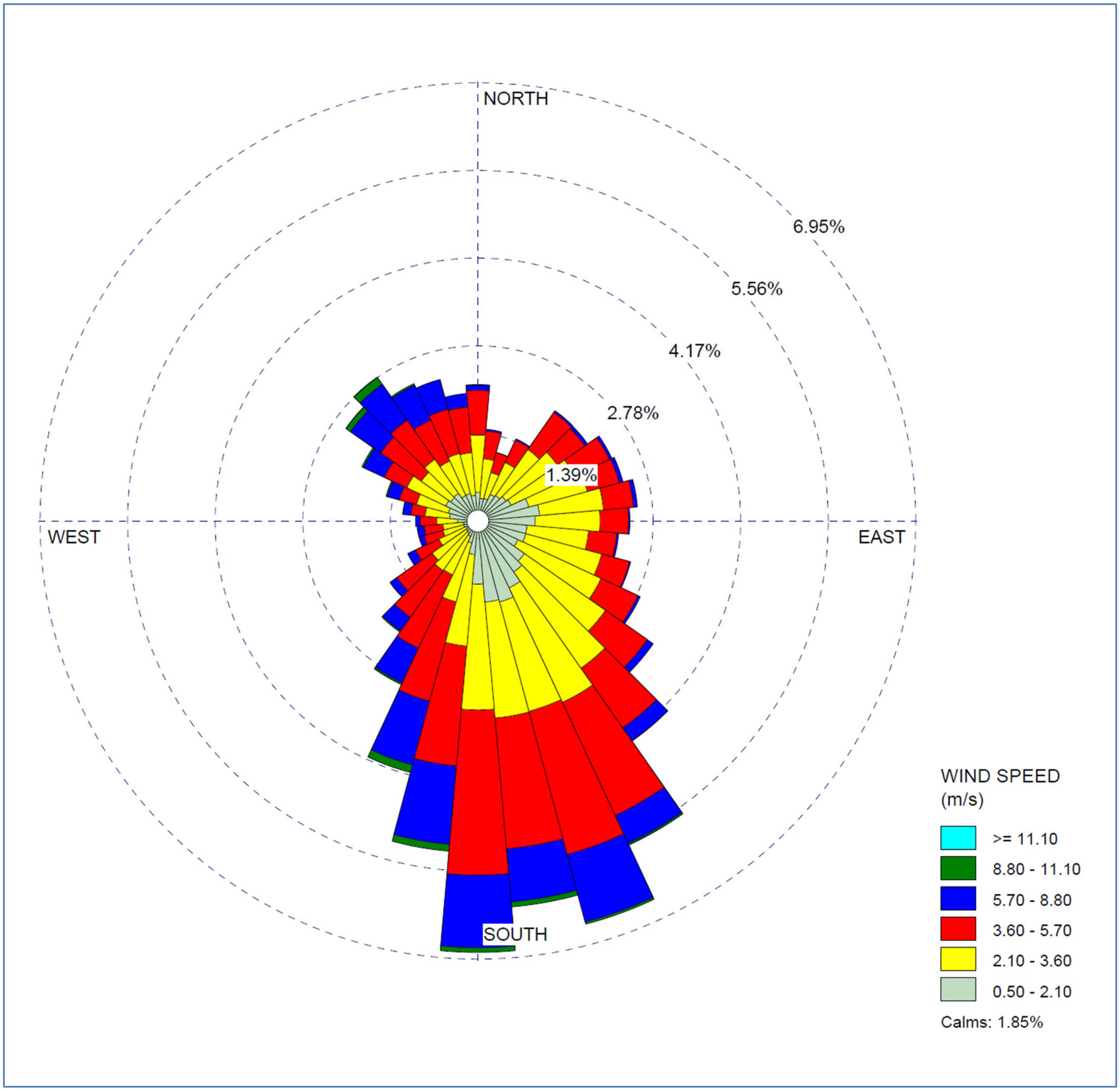

Figure 4 - Wind Rose for 2017-19 Period (Shows the Direction Winds are Blowing From)

2.3 Comparison with Ambient Monitoring Measurements

Predicted Concentration at Monitor Location - For the 2017-19 period, the Longview-Marshall monitor located 1.9 km north of the Martin Lake plant measured a design value of 89.7 ppb, or 234.7 $\mu g/m^3$, above the 1-hour NAAQS for SO_2 of 75 ppb, or 196.2 $\mu g/m^3$. The modeling analysis predicted a design value of 239.9 $\mu g/m^3$ at this monitor location. This suggests the modeling analysis is accurately estimating SO_2 impacts in the area surrounding the Martin Lake plant.

Predicted Maximum Concentration - The maximum design value predicted by the modeling analysis is 306.2 $\mu g/m^3$. This occurs approximately 3.5 km west south west southeast of the Martin Lake plant. This suggests the Longview-Marshal monitor is not located where the maximum impacts of SO_2 emissions from the Martin Lake plant occur.

2.4 Conservative Modeling Assumptions

A dispersion modeling analysis requires the selection of numerous parameters which affect the predicted concentrations. Some were selected which under-predict facility impacts.

Assumptions used in this modeling analysis which likely under-estimate concentrations include the following:

- Hourly stack exit velocity and temperature as measured by the facility CEM were not publicly available. Instead these were estimated using publicly available information. If the actual exit velocities and temperatures are lower than those estimated for this analysis, the modeled concentrations would be conservatively low.
- For the Pirkey plant, dimensions of facility buildings and structures were not publicly available. Instead these were estimating using publicly available photographs. If the actual dimensions are larger than those estimated for this analysis, the modeled concentrations would be conservatively low.
- To evaluate the full extent and concentration of impacts caused by the Martin Lake and Pirkey plants, it is recommended that USEPA obtain building parameters, actual values for hourly emissions, exit velocities, and temperatures from the CEM measurements collected at these plants, and incorporate those inputs into AERMOD. As noted, the use of actual hourly temperature and exit velocity may result in decreased plume dispersion and higher modeled impacts over a larger geographic area.

3. Modeling Methodology

3.1 Air Dispersion Model

The modeling analysis used the most recent version of USEPA's AERMOD program, v. 19191. AERMOD, as available from the Support Center for Regulatory Atmospheric Modeling (SCRAM) website, was used in conjunction with a third-party modeling software program, *AERMOD View*, sold by Lakes Environmental Software.

3.2 Control Options

The AERMOD model was run with the following control options:

- 1-hour average air concentrations
- Regulatory defaults

An evaluation was conducted to determine if the modeled facility was located in a rural or urban setting using USEPA's methodology outlined in Section 7.2.3 of the Guideline on Air Quality Models.[9] For urban sources, the URBANOPT option is used in conjunction with the urban population from an appropriate nearby city and a default surface roughness of 1.0 meter. Methods described in Section 4.1 were used to determine whether rural or urban dispersion coefficients were appropriate for the modeling analysis.

3.3 Output Options

The AERMOD analysis was based on recent meteorological data. The modeling analysis was conducted using sequential meteorological data from the 2017-19 period. Consistent with USEPA's Modeling Guidance for SO_2 NAAQS Designations, AERMOD provided a table of fourth-high 1-hour SO_2 impacts concentrations consistent with the form of the 1-hour SO_2 NAAQS.[10]

Please refer to Table 1 for the modeling results.

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[9] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005.

[10] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 24-26.

4. Model Inputs

4.1 Geographical Inputs

The air dispersion modeling analysis used a coordinate system for identifying the geographical location of emission sources and receptors. These geographical locations are used to determine local characteristics (such as land use and elevation), and also to ascertain source to receptor distances and relationships.

The Universal Transverse Mercator (UTM) NAD83 coordinate system was used for identifying the easting (x) and northing (y) coordinates of the modeled sources and receptors.

The facility was evaluated to determine if it should be modeled using the rural or urban dispersion coefficient option in AERMOD. A GIS was used to determine whether rural or urban dispersion coefficients apply to a site. Land use within a three-kilometer radius circle surrounding the facility was considered. USEPA guidance states that urban dispersion coefficients are used if more than 50% of the area within 3 kilometers has urban land uses. Otherwise, rural dispersion coefficients are appropriate.[11]

USEPA's AERSURFACE v. 20060 was used to develop the meteorological data for the modeling analysis. This model was also used to evaluate surrounding land use within 3 kilometers of Harrington Station. Based on the output from the AERSURFACE, approximately 9% of surrounding land use around the station was of urban land use types including Types 22, 23 and 24 which are Low, Medium and High Intensity Development.

This is less than the 50% value considered appropriate for the use of urban dispersion coefficients. Based on the AERSURFACE analysis, it was concluded that the rural option would be used for the modeling summarized in this report. Please refer to Section 4.5.3 for a discussion of the AERSURFACE analysis.

4.2 Emission Rates and Source Parameters

Actual hourly emission rates were used for the modeling analysis. Emission rates from the facility continuous emissions monitoring system (CEM) were not publicly available. These were instead obtained from EPA's Clean Air Markets Program Database (CAMD) for the 2017-19 period.

Stack parameters including location, height, diameter and temperature were obtained from a prior

[11] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, November 9, 2005, Section 7.2.3.

modeling report for the Martin Lake plant and the annual survey compiled by the U.S. Energy Information Administration for the Pirkey plant. Stack locations were verified using aerial photographs.

Hourly stack exit velocities and temperatures were used for the modeling analysis. Actual hourly stack flow rates, exit velocities and temperatures from the facility CEM were not publicly available. These were instead estimated based on information available for these power plants.

Stack parameters used for the modeling analysis are summarized in Table 2.

Table 2 –Stack Parameters

Facility	Martin Lake			Pirkey
Stack	M01	M02	M03	P01
Description	Unit 1	Unit 2	Unit 3	Unit 1
X Coord. [m]	351999	352041	352084	360449
Y Coord. [m]	3570400	3570309	3570217	3592510
Base Elevation [m]	95.01	95.01	95.01	109.43
Release Height [m]	137.77	137.77	137.77	160.02
Inside Diameter [m]	7.01	7.01	7.01	7.62
Gas Exit Temperature [°K]	Hourly Values			
Gas Exit Velocity [m/s]				
Actual Emission Rate [g/s]				

4.3 Building Dimensions and GEP

The downwash effects of nearby buildings and structures were used for the modeling analysis.

Building locations and dimensions were obtained from the March 2016 report, C*haracterization of 1-Hour SO2 Concentrations in the Vicinity of the Martin Lake Steam Electric Station*, prepared by AECOM for Luminant Generation Company LLC. The availability of the building locations and dimensions allowed for evaluation of aerodynamic downwash.

Photographs of Pirkey plant show the boiler stack is relatively short and likely affected by downwash effects from nearby buildings and structures. No building dimensions were publicly available. To incorporate downwash effects, these dimensions were estimated using aerial and facility photographs.

4.4 Receptors

Three receptor grids were employed:

1. A 100-meter Cartesian receptor grid centered on the Martin Lake plant and extending out 5 kilometers.
2. A 500-meter Cartesian receptor grid centered on the Martin Lake plant and extending out 10 kilometers.
3. A 1,000-meter Cartesian receptor grid centered on the Martin Lake plant and extending out 50 kilometers. 50 kilometers is the maximum distance accepted by USEPA for the use of the AERMOD dispersion model.[12]

To reflect a representative inhalation level, a flagpole height of 1.5 meters was not used for all modeled receptors. The use of a flagpole height is not expected to significantly effect the predicted impacts.

Elevations for receptors were obtained from National Elevation Dataset (NED) GeoTiff data. GeoTiff is a binary file that includes data descriptors and geo-referencing information necessary for extracting terrain elevations. These elevations were extracted from 1 arc-second (30 meter) resolution NED files. The USEPA software program AERMAP v. 18081 is used for these tasks.

4.5 Meteorological Data

To ensure the accuracy of the modeling analysis, recent meteorological data for the 2017-19 period were prepared using the USEPA's program AERMET which creates the model-ready surface and profile data files required by AERMOD. Required data inputs to AERMET included surface meteorological measurements, twice-daily soundings of upper air measurements, and the micrometeorological parameters surface roughness, albedo, and Bowen ratio. One-minute ASOS data were available so USEPA methods were used to reduce calm and missing hours.[13] The USEPA software program AERMINUTE v. 15272 is used for these tasks.

This section discusses how the meteorological data was prepared for use in the 1-hour SO_2 NAAQS modeling analyses. The USEPA software program AERMET v. 19191 is used for these tasks.

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[12] USEPA, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W to 40 CFR Part 51, Section A.1.(1), November 9, 2005.

[13] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, p. 19.

4.5.1 Surface Meteorology

Surface meteorology was obtained for Longview Texas Regional Airport located near the Martin Lake Generating Station. Integrated Surface Hourly (ISH) data for the 2017-2019 period were obtained from the National Climatic Data Center (NCDC). The ISH surface data was processed through AERMET Stage 1, which performs data extraction and quality control checks.

4.5.2 Upper Air Data

Upper-air data are collected by a "weather balloon" that is released twice per day at selected locations. As the balloon is released, it rises through the atmosphere, and radios the data back to the surface. The measuring and transmitting device is known as either a radiosonde, or rawindsonde. Data collected and radioed back include: air pressure, height, temperature, dew point, wind speed, and wind direction. The upper air data were processed through AERMET Stage 1, which performs data extraction and quality control checks.

Concurrent 2017-2019 upper air data from twice-daily radiosonde measurements obtained at the most representative location were used. This location was the Shreveport, Louisiana measurement station. These data are in Forecast Systems Laboratory (FSL) format and were downloaded in ASCII text format from NOAA's FSL website.[14] All reporting levels were downloaded and processed with AERMET.

4.5.3 AERSURFACE

AERSURFACE is a program that extracts surface roughness, albedo, and daytime Bowen ratio for an area surrounding a given location. AERSURFACE uses land use and land cover (LULC) data in the U.S. Geological Survey's National Land Cover Dataset to extract the necessary micrometeorological data. The current version of AERSURFACE v. 20060. It was used with National Land Cover Database for 2016 including land cover, canopy and impervious surfaces.

AERSURFACE was used to develop surface roughness, albedo, and daytime Bowen ratio values in a region surrounding the meteorological data collection site. AERSURFACE was used to develop surface roughness in a one-kilometer radius surrounding the data collection site. Bowen ratio and albedo were developed for a 10-kilometer by 10-kilometer area centered on the meteorological data collection site. These micrometeorological data were processed for seasonal periods using 30-degree sectors.

For the years processed, 2017, 2018 and 2019, the levels of precipitation were all Average. These

[14] Available at: http://esrl.noaa.gov/raobs/

were based on annual levels for the Longview Texas Regional Airport.[15] For all years, winter months were assumed to have no continuous snow cover.

4.5.4 Data Review

Missing meteorological data were not filled as the data file met USEPA's 90% data completeness requirement.[16] The AERMOD output file shows there were 1.25% missing data across the entire 2017-19 meteorological period.

To confirm the representativeness of the airport meteorological data, the surface characteristics of the airport data collection site and the modeled source location were compared. Since the Longview Texas Regional Airport is located close to Martin Lake Generating Station, this meteorological data set was considered appropriate for this modeling analysis.[17] Additionally, this weather station provided high quality surface measurements, and had similar land use, surface characteristics, terrain features and climate.

Finally, TCEQ provides pre-processed meteorological data suitable for modeling for each county.[18] For Rusk County, TCEQ recommends using data from the same surface and upper air stations used for this modeling analysis. The TCEQ data were not used for this project because they had not been processed using the latest versions of USEPA modeling software.

5. Background SO_2 Concentrations

Background concentrations were determined consistent with USEPA's Modeling Guidance for SO_2 NAAQS Designations.[19, 20] To preserve the form of the 1-hour SO_2 standard, based on the 99th percentile of the annual distribution of daily maximum 1-hour concentrations averaged across the number of years modeled, the background fourth-highest daily maximum 1-hour SO_2 concentration was added to the modeled fourth-highest daily maximum 1-hour SO_2 concentration.[21]

The background SO_2 concentration used for the modeling analysis is the lowest design value for the 2017-19 period from all ambient monitors in Texas. This is the concentration of 1.8 ppb or 4.7

[15] https://www.ncdc.noaa.gov/cdo-web/search
[16] USEPA, Meteorological Monitoring Guidance for Regulatory Modeling Applications, EPA-454/R-99-05, February 2000, Section 5.3.2, pp. 5-4 to 5-5.
[17] USEPA, AERMOD Implementation Guide, March 19, 2009, pp. 3-4.
[18] Texas Commission on Environmental Quality, Meteorological Data for Refined Screening with AERMOD, http://www.tceq.texas.gov/permitting/air/modeling/aermod-datasets.html, Last updated May 12, 2020.
[19] USEPA, Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standards, Attachment 3, March 24, 2011, pp. 20-23.
[20] USEPA, SO_2 NAAQS Designations Modeling Technical Assistance Document, August 2016, DRAFT.
[21] USEPA, Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard, August 23, 2010, p. 3.

μg/m^3 which was measured at the Milam County monitor identified as the Rockdale John D. Harper Road Monitor located at 3990 John D Harper Road (Coordinates: 30.569534, -97.076294). It has USEPA ID #483311075.

An ambient monitor for SO_2 began operation on November 1, 2017 approximately 1.9 kilometers north of the station in Martin Creek Lake State Park.[22] It is identified as the Longview-Marshall monitor with USEPA ID #484011082. This monitor is located in an area expected to affected by emissions from the Martin Lake plant so was not used to obtain a background concentration.

6. Reporting

All files from the programs used for this modeling analysis are available to regulatory agencies. These include analyses prepared with AERSURFACE, AERMET, AERMAP, and AERMOD.

[22] https://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.view_site&siteAQS=484011082