Florida Department of Environmental Protection

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Via Federal Express and Electronic-Mail

June 30, 2016

R. Scott Davis
Chief, Air Planning Branch
Air, Pesticides, and Toxics Management Division
U.S. Environmental Protection Agency – Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

Re: Data Requirements Rule for the 2010 One-Hour Sulfur Dioxide Primary National Ambient Air Quality Standard – Technical Modeling Protocol Submittal

Dear Mr. Davis:

On August 21, 2015, the U.S. Environmental Protection Agency (EPA) promulgated the "Data Requirements Rule" (DRR) (80 FR 51052; codified at 40 CFR Part 51, Subpart BB), which requires states to evaluate compliance with the 2010 one-hour sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS) in areas surrounding specified SO_2 sources. As you are aware, on January 15, 2016, Florida submitted to EPA Region 4 a list of sources in Florida with SO_2 emissions that exceeded a 2,000 tons-per-year (tpy) threshold during the most recent year for which data are available. Pursuant to the DRR, states can choose to perform area characterizations around the specified sources using either air quality monitoring or air dispersion modeling. The Florida Department of Environmental Protection (Department) has chosen to characterize the areas around the state's eleven facilities subject to the DRR (primary facilities) using the air dispersion modeling approach.[1]

For areas that states choose to characterize using air dispersion modeling, a technical modeling protocol must be submitted to the applicable EPA Regional Administrator no later than July 1, 2016. This modeling protocol is required to include information about the general dispersion modeling approach that the state will follow, including the model, modeling domain, receptor grid, emissions dataset(s), meteorological dataset(s), and the method by which the state air agency will account for background SO_2 concentrations. 40 CFR 51.1203(b). This letter,

[1] As noted in the Department's January 15, 2016, submittal to EPA Region 4, Gulf Power Company's Lansing Smith Plant (Source ID No. 005-0014) shut down its coal-fired units effective March 31, 2016. The remaining emissions units at the facility have a combined potential to emit SO_2 less than 2000 tons-per-year. No further analysis of this source is required under the DRR.

together with the accompanying appendices, meets the requirements of 40 CFR 51.1203(b) for a technical modeling protocol under the DRR.

The Department's dispersion modeling performed in response to DRR requirements will follow all applicable EPA guidance, including *Appendix W to 40 CFR Part 52: The Guideline on Air Quality Models* (Appendix W) and the *SO_2 NAAQS Designations Modeling Technical Assistance Document* (Modeling TAD). The Department recognizes that a revised version of Appendix W is currently under review by EPA and should be finalized before states' final modeling demonstrations are scheduled to be submitted. This technical modeling protocol will, therefore, follow the revised Appendix W, as proposed. DEP will, however, adhere to the finalized version of Appendix W in completing modeling for area characterizations under the DRR.[2]

General Dispersion Modeling Approach

All eleven areas in Florida subject to characterization under the DRR will be assessed individually using the most recent regulatory version of EPA's preferred near-field dispersion model for inert pollutants—AERMOD—including the pre-processing programs AERMET, AERMINUTE, AERMAP, and AERSURFACE.

Dispersion Model

Appendix W recommends the use of AERMOD for all regulatory modeling of inert pollutants in the near field. The Department will process the AERMOD model using the most recent version of Lakes Environmental's *AERMOD View* program with the following options and settings:

- Regulatory default options (MODELOPT DFAULT CONC)
- Pollutant: SO_2 (POLLUTID SO2)
- Averaging Time: 1 hour (AVERTIME 1)
- Output: Annual fourth-high daily maximum 1-hour average, averaged over five years (RECTABLE ALLAVE 4TH RECTABLE 1 4TH)
- Receptor, building, and source elevations based on data from AERMAP
  - NED GEOTIFF – 10m resolution
- Land use: rural dispersion methods only
  - All modeled areas are classified rural through the Auer Land Use Method
- Building downwash parameters will be calculated for all sources at the primary facilities using the Building Profile Input Program for PRIME (BPIPPRM) for input into AERMOD

[2] The Department has a pending request with EPA's Modeling Clearinghouse for the use of a non-guideline, alternative model (LOWWIND3) in Hillsborough County for the state's air quality characterization modeling under the DRR.

Receptor Grid

According to EPA's March 2011 Memo *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*, it is expected that the distance from the source to the area of the maximum 1-hour impact of SO_2 will be approximately 10 times the source release height. As a conservative approach, the Department will extend a dense grid of receptors from the primary facility's tallest stack (if multiple stacks are the tallest, the most centrally located of these will be chosen) to the greater of 20 times the tallest stack height at the primary facility or 2500m. Receptor density will then decrease in 2500m intervals as follows:

- Discrete Cartesian receptors
  - 50m spacing along primary facility fence line;
  - 100m spacing to greater of 20 x tallest stack height or 2500m;
  - 250m spacing to 2500m beyond 100m grid;
  - 500m spacing to 2500m beyond 250m grid.
  - The receptor grid will be expanded if increasing concentrations are found near the edge or if high concentrations are found in an area with insufficiently dense grid spacing. Any receptors placed within a modeled facility's fence line will be removed. At present, DEP does not anticipate utilizing the DRR-allowed method for removing receptors in areas where it is not possible to place a monitor.

Meteorological Data

Florida has very uniform, mostly flat terrain and a relatively dense network of high-quality National Weather Service (NWS) Automated Surface Observing System (ASOS) stations for use in air dispersion modeling demonstrations. Meteorological surface observations for 2012 - 2014 from the nearest representative NWS ASOS station will be processed with the most recent version of AERMET for use in area characterizations performed for the DRR. These data, including the integrated surface hourly data (ISHD) and ASOS 1-minute wind data, will be retrieved from the National Climatic Data Center's (NCDC) file transfer protocol site. Upper air parameters will be derived from radiosonde observations (RAOB) from the nearest NWS sounding location. Missing 12Z soundings will be filled with archived modeled soundings from the National Oceanic and Atmospheric Administration's (NOAA) Air Resources Laboratory (ARL) prior to processing in AERMET.

The following explicit options and settings will be used when processing AERMET:

- ASOS 1-minute wind data processed by AERMINUTE (ASOS1MIN)
- Minimum wind speed threshold: 0.5 m/s (THRESH_1MIN 0.5)
- NWS wind and temp data are substituted for missing onsite data (METHOD REFLEVEL SUBNWS)
- Adjustments to u* for low wind speeds are used (METHOD STABLEBL ADJ_U*)
- Surface characteristics extracted from 1992 NLCD via AERSURFACE for the ASOS location

- Study area radius: 1 km
- Surface roughness varied by 12 sectors monthly

Emissions Data

Consistent with 40 CFR 51.1203(d), the Department will use either enforceable allowable emission rates or the most recently available dataset of actual emissions data to characterize the primary facilities. Long-term average allowable emission rates will be adjusted to an equivalent 1-hour emission rate using the method outlined in EPA's Modeling TAD. Actual emissions data from a recent period representative of current operations will be used to perform this calculation.

Background Characterization

Background concentrations of SO_2 will be characterized by both the explicit modeling of nearby large sources of SO_2 and the inclusion of an hour of day by season (BACKGRND SEASHR) varying background concentration derived from a nearby representative monitor. All facilities that emitted more than 100 tons of SO_2 in 2014 within 20 km of a primary facility will be modeled. Some additional large sources beyond 20 km will also be included on a case-by-case basis. All modeled background sources will be characterized with actual emissions data, where available, and enforceable allowable emission rates otherwise. The calculation of the varying monitored background will be performed by taking the three-year average of the seasonal second-high concentration by hour of day as outlined in the Modeling TAD. Prior to performing this calculation, monitored values that occurred when the wind direction was within 45 degrees of a modeled facility will be removed to avoid double-counting. Monitoring data for the years 2012-2014 will be used to perform these calculations in most areas.[3]

* * *

If you have any questions about this submittal, please contact Preston McLane at (850) 717-9089 or by e-mail at Preston.McLane@dep.state.fl.us.

Sincerely,

Justin B. Green, Director
Division of Air Resource Management

JG/pm

[3] In Hamilton County, the monitored background concentrations will be derived from 2014-2015 monitoring data due to the shutdown of several large sources of SO_2 near the reference monitor in 2014. In Citrus County, the monitored background concentrations will also be derived from 2014-2015 monitoring data as the reference monitor did not begin operation until December 2013.

Attachments

DRR_Florida_Modeling Inventory Excel File

- Modeled Sources: Preliminary inventory of explicitly modeled sources for each modeling domain.
- Un-modeled Nearby Sources: List of nearby sources represented in AERMOD with a monitored background concentration for each modeling domain.

DRR_Florida_Modeling Summary Excel File

- Background Monitors: Summary of ambient SO_2 monitors selected to represent background concentrations.
- Meteorological Sites: Summary of meteorological surface stations chosen for each modeling domain.
- Receptor Grids: Summary of the preliminary receptor grids for each modeling domain.

AERMET Files Folder

- Surface and upper air AERMET meteorological files for use in AERMOD.

Equivalency Ratio Calculations Folder

- Preliminary calculations for equivalent 1-hour emission rate ratios for sources with longer-term emission rates.

Overview Maps Folder

- Maps of each modeling domain for visual reference.

Monitored Background Development Folder

- Preliminary calculations of varying background concentrations for use in AERMOD for each modeling domain.