

Summary of Modeling Guidance for SO₂ Implementation

Background

EPA is issuing modeling guidance for the 1-hour SO₂ NAAQS in support of implementing this new SO₂ standard. This guidance explains the expected application of refined dispersion modeling to support the SIP process regarding:

1. the use of modeling in the development of CAA Section 191-192 SIPs for nonattainment areas; and
2. The use of modeling in the development of Section 110(a) (1) and (2) SIPs (commonly referred to as “maintenance” and “infrastructure” SIPs).

This guidance is based on and is consistent with EPA’s *Guideline on Air Quality Models*, also published as Appendix W of 40 CFR Part 51. Appendix W is the primary source of information on the regulatory application of air quality models for State Implementation Plan (SIP) revisions for existing sources and for New Source Review (NSR) and Prevention of Significant Deterioration (PSD) programs. Air quality modeling in this SIP process would need to employ air quality dispersion models that properly address the source-oriented nature of SO₂ and, thus, should rely upon the principles and techniques in Appendix W. When questions arise about modeling techniques and procedures, state and local agencies should consult with the appropriate EPA Regional Modeling Contact.

Guidance summary

- The implementation modeling framework is shown in Figure 1 and is a general methodology states can follow in modeling for state implementation plans.
- States will use the EPA’s preferred model for near-field dispersion, AERMOD, unless use of an alternative model is justified (Section 3.2 of Appendix W).
- If the modeling is being performed around a violating monitor, the domain should be centered on the violating monitor. If the modeling is being done for an area without a violating monitor, the domain should be centered on the dominant source(s) in an area, that is, the source or sources expected to contribute the most to SO₂ air quality levels. In both cases, the domain should then extend to include nearby sources that are thought to cause or contribute to a potential NAAQS violation or unclassifiable area.
- It is reasonable to initially focus on the most significant sources of SO₂ emissions, e.g., sources emitting greater than 100 tons (maximum allowable) per year. Please note, however, that smaller sources can also cause or contribute to a NAAQS violation, especially sources with short stacks and/or located in complex terrain (i.e., where receptor elevation is above stack height). While the analysis begins with a nonattainment area or initially assumes an area within 50 km of a violating monitor or dominant source, it may not be necessary to explicitly model all sources within these initial areas through use of screening modeling to screen out emitters or use of representative background concentrations from monitors.
- Sources should be modeled using short-term allowable emissions. These emission rates should be available from permit information or inventories used for PSD/NSR modeling. Emission rates

can reflect enforceable local or national control strategies that are to be in place by the attainment date. Emission parameters (stack height, stack diameter, etc.) should be reflective of any controls.

- Stacks with heights below Good Engineering Practices (GEP) should be modeled with actual stack heights. Stacks with heights above GEP should be modeled at GEP. Building downwash should be considered for stacks below GEP.
- Sources should be modeled using representative meteorological data, either 5 years of representative National Weather Service (NWS) data or at least 1 year of site-specific, or onsite, meteorological data.
- Appropriate background concentrations should be included in the design value calculations and follow current modeling guidance for PSD/NSR permit modeling.
- Documentation of the modeling analyses, including modeling protocol and technical support document should be included.

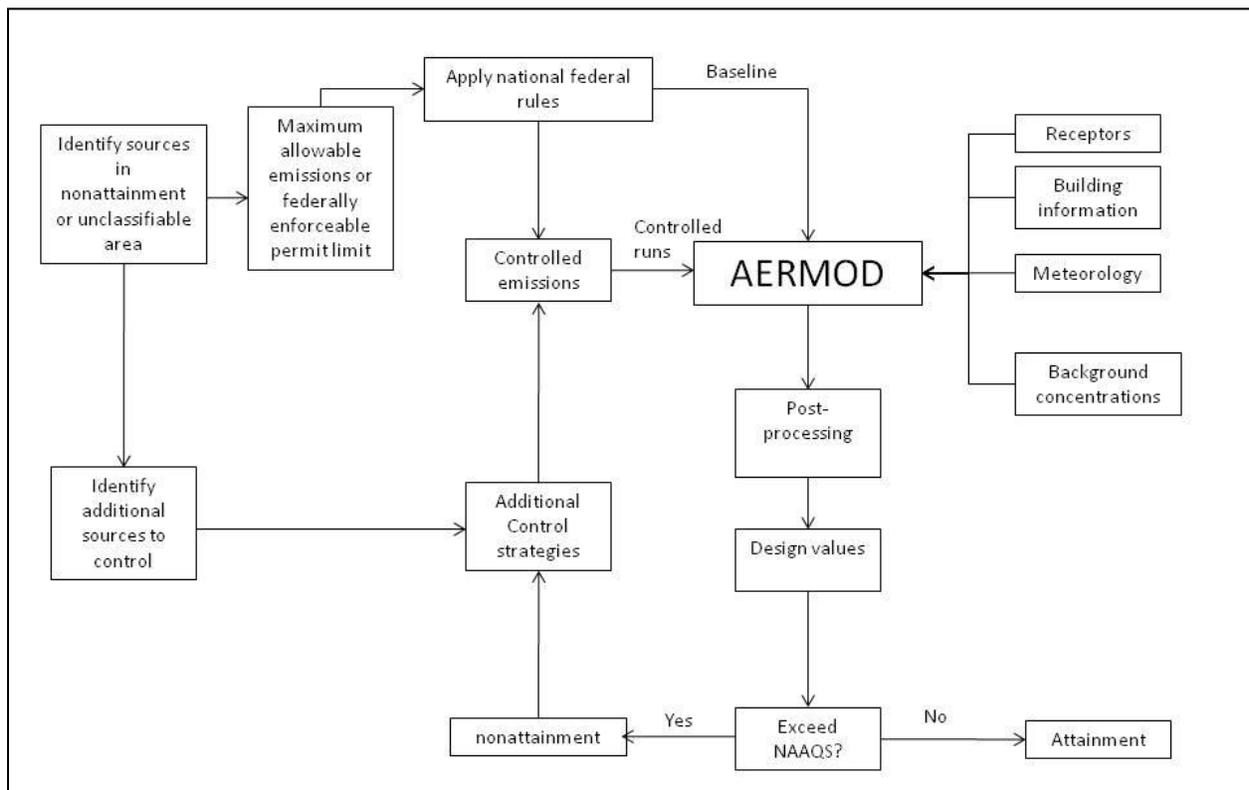


Figure 1. Flowchart of SO₂ Modeling Framework for SIP Implementation.