

How do I Model Compliance with the new SO₂ and NO₂ NAAQS?

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Background

- NO₂ Standard
 - 98th Percentile (8th Highest) of the 3-Year Average of the Maximum Daily 1-Hour Values
 - 100 ppb = 188 µg/m³
- SO₂ Standard
 - 99th Percentile (4th Highest) of the 3-Year Average of the Maximum Daily 1-Hour Values
 - 75 ppb = 196 µg/m³

Who has Modeled?

- How many people have modeled their facility to see where they stand with respect to the standards?
- How many of those people have discovered “issues”?

Why should I model?

- TO BE PROACTIVE
 - Make sure your existing facility comply with the standards
 - Make sure your permit modification complies with standard
 - Make sure your change in stack parameters doesn't cause an issue

Why should I model?

- Compliance or Non-Compliance with the NAAQS can be shown either through a monitor that is out of attainment or modeling that shows non-attainment.
- LDEQ has to make attainment determinations for SO₂ NAAQS based on monitoring and modeling data.

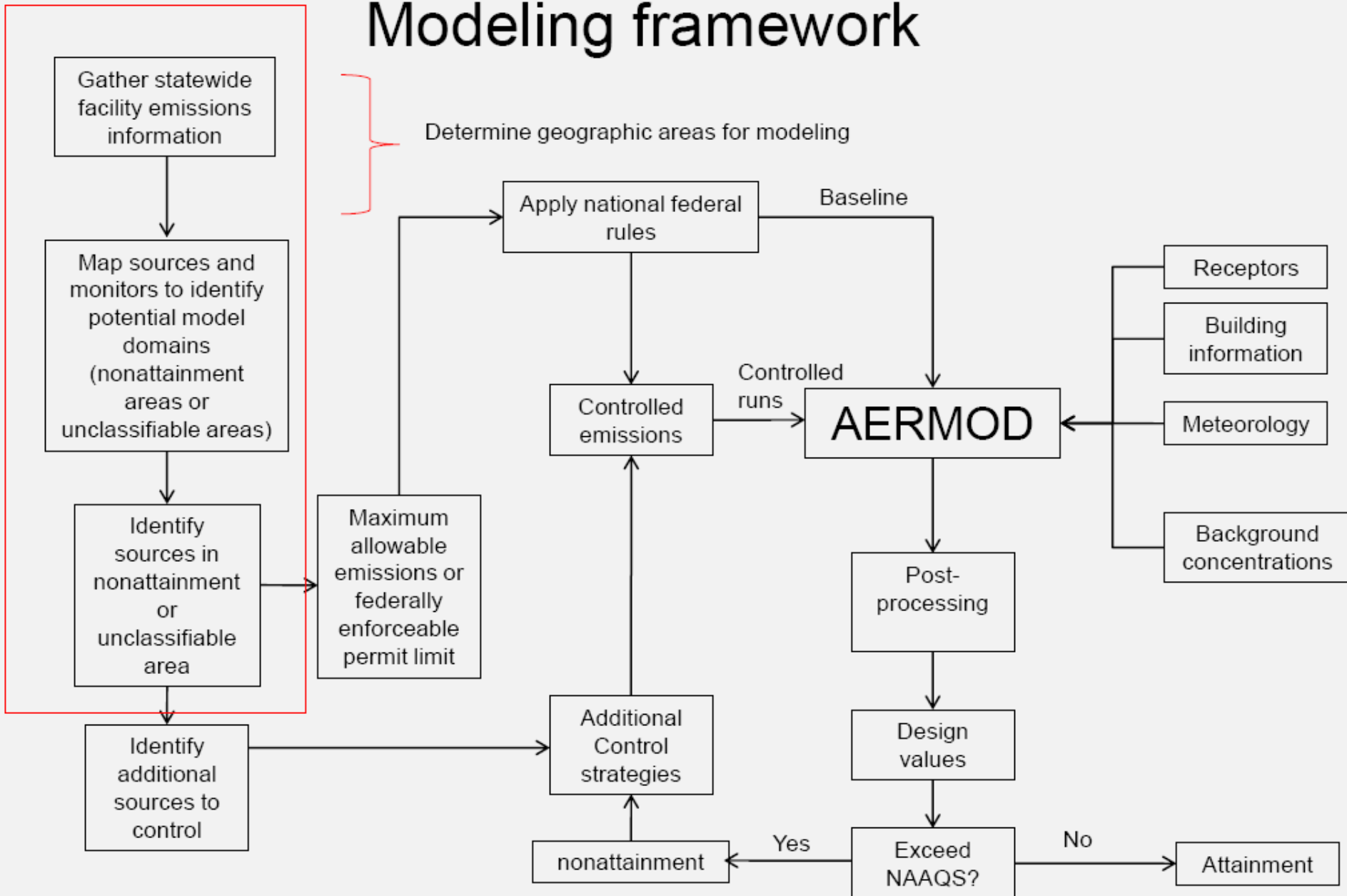
Resources

- March 1, 2011 EPA Memo “Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO₂ National Ambient Air Quality Standard”
- March 24, 2011 EPA Memo “Area Designations for the 2010 Revised Primary Sulfur Dioxide National Ambient Air Quality Standard”
- Draft EPA “Guidance for 1-Hour SO₂ NAAQS SIP Submissions”
- LDEQ’s SO₂ Stakeholder Website
 - <http://www.deq.louisiana.gov/portal/DIVISIONS/AirPermits/AirQualityPlanning/LouisianaSulphurDioxide.aspx>

Again – why should I model?

- All of the resources listed above mostly deal with SIP modeling.
- LDEQ must model SO₂ sources in order to determine attainment status.
- If an area is deemed non-attainment, LDEQ will develop regulations in order to get that area in attainment.
- To have input into how your area comes into compliance with NAAQS

Modeling framework



Things to Consider

- Standards are now short-term – 1-hour averages
- Must model using “permitted” maximum hourly emission rates
- For those with alternate operating scenarios – must model all scenarios
- Stack parameters greatly affect dispersion
- Remember building downwash

Things to Consider

- Intermittent Emissions
 - Many sources are permitted 500 hour per year but actually operate much less
 - The use of the maximum hourly PTE along with the intermittent nature of emissions and the probabilistic nature of standard could result in significantly high modeled concentrations
 - The overestimation is the result of worst case emissions occurring during the worst case meteorological conditions

Things to Consider

- Compliance demonstrations should be based on emission scenarios that can logically be assumed to be relatively continuous or which occur frequently enough to contribute
- While it's recognized that the intermittent emission sources could operate at the same time as primary sources, the guidance assumes that they **do** operate simultaneously

Receptor Grid

- EPA says that receptors should be placed in areas that are considered ambient air and of such density to detect significant concentration gradients
- Use LDEQ's standard PSD modeling guidance

Emission and Source Characteristics

- Maximum allowable or federally enforceable emission limits should be used
- Source release parameters should be consistent with the release scenario
- Accurate locations and building parameters are important
- Urban vs. Rural Determination
 - AERMOD includes a 4 hour half-life for urban SO₂ sources

Meteorological Data

- Use 5 years of representative National Weather Service data or 1 year of site-specific data
- The 3-year standard does not pre-empt use of 5 years of NWS data
- Calculate concentrations for the modeling period, not the 3 year averages
 - Modeling 2005-2009: don't calculate 3-year average for 2005-2007, 2006-2008, and 2007-2009

How do I calculate final concentration?

- At each receptor:
 - For each modeling day – determine the maximum 1-hour concentration (modeled concentration + background) MAXDAILY
 - This results in 365 concentrations for each receptor
 - Determine the 8th highest (NO₂) or 4th Highest (SO₂) concentration
 - This results in 5 concentrations
 - Average concentrations to determine concentration
 - Compare to NAAQS

What if my modeling shows “issues”?

- Determine site-specific control strategies
- Join one of the SO₂ Work Groups
- Meet with LDEQ to discuss control and/or permitting options



Conclusion

BE PROACTIVE

Questions?

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