

Status of SO₂ Implementation and Modeling Issues

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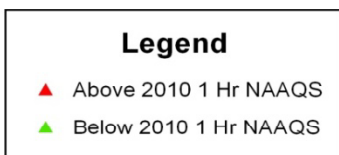
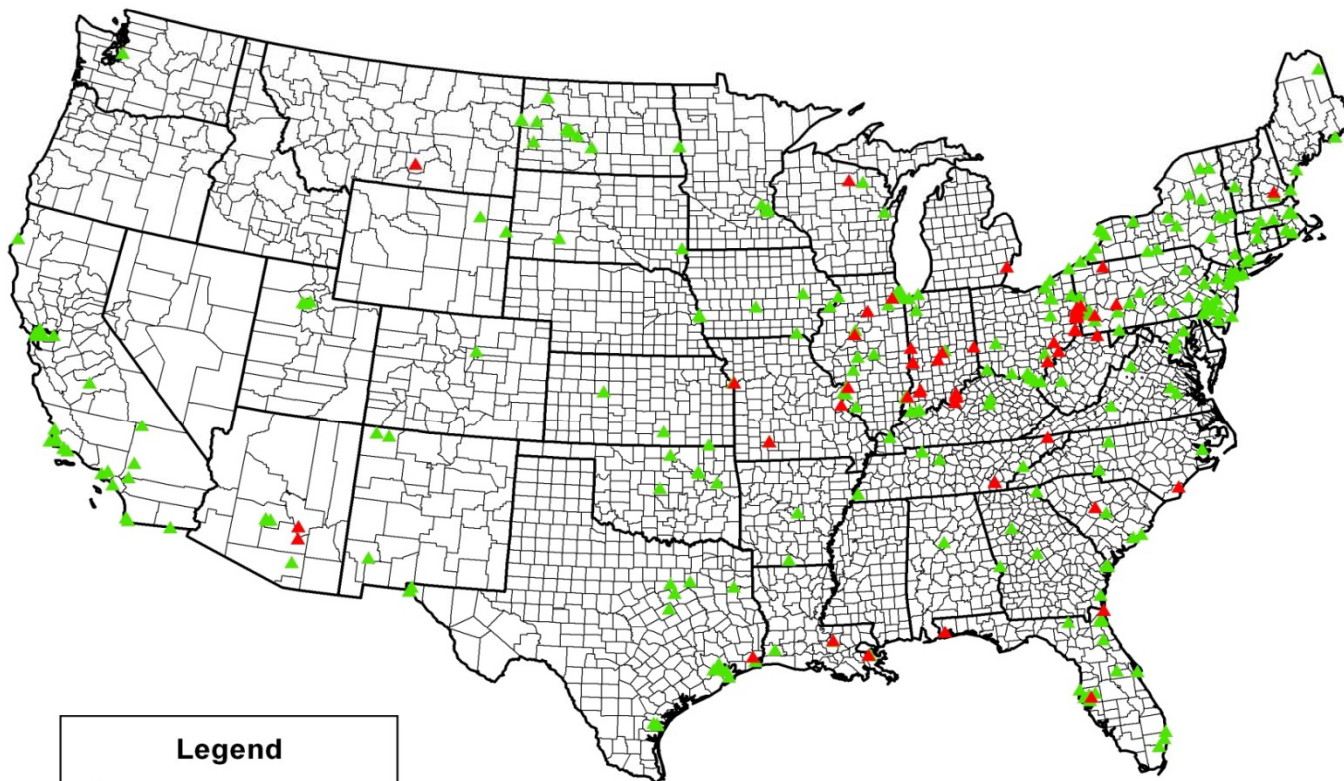
Briefing Topics

- ✓ Brief background on SO₂, current air quality, and designations
- ✓ Quick Review of Implementation Discussion in SO₂ NAAQS Rule
- ✓ Upcoming SO₂ Implementation Rulemaking
- ✓ Background and Status on the Draft SO₂ SIP Guidance Document
- ✓ Overview of Draft Guidance Document
 - SO₂ SIP Submittals
 - Section 110(a)(1) Maintenance SIP Elements.
 - Control Strategy for Attaining the 1-Hour SO₂ NAAQS
 - SO₂ Threshold Level
 - Criteria for Redesignation to Attainment
 - SO₂ Modeling Guidance
- ✓ Next Steps

Background

- New 1-hr 75 ppb SO₂ NAAQS promulgated June 3, 2010
- Current scientific evidence links health effects with short-term exposure to SO₂ ranging from 5 minutes to 24 hours. Adverse respiratory effects include narrowing of the airways which can cause difficulty breathing and increased asthma symptoms. These effects are particularly important for asthmatics during periods of faster or deeper breathing (e.g., while exercising or playing)
- Studies also show an association between short-term SO₂ exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses--particularly in at risk populations including children, the elderly and asthmatics

SO₂ Monitor Design Values 2008-2010



59 violating monitors in 18 states and 1 territory, (48 counties)

Designations

- Final NAAQS package describes EPA intent to use hybrid modeling/monitoring approach to assess compliance with NAAQS
 - Approach responded to comments expressing concerns about burdens of implementing sufficient monitoring network
 - Approach is also more consistent with historical hybrid approach
- Also described intent to apply hybrid approach to initial designations based on 2008-2010 monitoring data, and refined dispersion modeling results if provided by the state.
 - Areas which violate the standard would be designated as “nonattainment”
 - Areas that have both monitoring data and appropriate refined modeling results showing no violations would be designated as “attainment”
 - All other areas would be designated as “unclassifiable”
- State designation recommendations were submitted June 2011
- We anticipate sending “120-day letters” in February 2012; final designations June 2012

SO₂ Implementation Guidance

- The final SO₂ NAAQS package also described our intended approach to use the hybrid monitoring/modeling approach to implementing the SO₂ standard
- In spite of large number of unclassifiable areas, EPA did not expect this approach to delay expeditious attainment or cause indefinite uncertainty because Section 110(a)(1) still requires SIPs to implement, maintain, and enforce the NAAQS
- Section 110(a)(1) and (2) require SIP revisions addressing infrastructure and state-wide “implementation, maintenance, and enforcement” of the NAAQS by June 2013
- EPA laid out initial thinking on how to apply the hybrid monitoring/modeling approach to implementing 110(a)(1) for the 1-hour SO₂ NAAQS
 - EPA expects these SIP revisions to demonstrate, through refined modeling, that sources contributing to monitored and modeled violations will be sufficiently controlled to ensure timely attainment and maintenance of the new SO₂ NAAQS
- Committed to follow up with more detailed guidance through notice-and-comment process, particularly with respect to modeling guidance

Key Features of SO₂ Guidance from NAAQS Rule

- Continues practice of using hybrid modeling/monitoring approach for SO₂ to determine if areas comply with standard
- States with unclassifiable areas would need to submit to EPA Section 110(a) attainment/maintenance SIPs
- SIPs would need to include as necessary, enforceable emissions limitations, timetables, testing/reporting, etc.
- Suggested attainment/maintenance should be as expeditiously as possible, but no later than 5 years from effective date of designations (i.e., nonattainment area date)
- States with nonattainment areas would also need to submit nonattainment SIPs for those areas 18 months after designations
- These SIPs can account for SO₂ reductions that would result from compliance with national and regional regulations, including emissions controls for electric utilities and industrial boilers

SO₂ Rulemaking

- In a parallel effort to the guidance, we are also drafting a rulemaking on key issues from the SO₂ guidance document. We anticipate developing this rule as quickly as possible
- Objectives for the rulemaking:
 - To codify the technical approach for determining the compliance with the 1-hour SO₂ NAAQS (e.g., hybrid modeling/monitoring, modeling protocol, etc.).
 - To establish compliance deadlines for the section 110(a)(1) attainment/maintenance SIPs
 - To establish regulations for the elements that should be included in the attainment/maintenance SIP submittal
 - To establish criteria for how areas designated as unclassifiable can be redesignated as attainment
- We would also incorporate issues from comments on draft guidance, as appropriate

Status of SO₂ SIP Guidance Document

- Draft guidance for SIP development and modeling released for public review on September 23, 2011
 - Public comment period extended until December 2
 - Revised guidance to be issued as soon as possible after public comment period
 - http://www.epa.gov/air/sulfurdioxide/pdfs/DraftSO2Guidance_9-22-11.pdf
- Contains guidance on:
 - Section 110(a)(1) attainment/maintenance SIP submittals
 - Section 191-192 nonattainment area SIP submittals
 - Transition from current SO₂ NAAQS
 - Redesignation to attainment
 - Modeling (Appendix A)
 - Infrastructure SIP submittals (Appendix B)
 - Non-modeling technical demonstrations of Attainment (Appendix C)

Important Implementation Dates for the 1-Hour SO₂ NAAQS

- **June 2010:** Promulgation of the 1-Hour SO₂ NAAQS
- **June 2012:** Anticipated Promulgation of Designations
- **August 2012:** Anticipated Effective Date for Designations
- **June 2013:** Section 110(a) SIP Submittals Due
 - Section 110(a)(1) attainment/maintenance SIPs
 - Section 110(a)(2) Infrastructure SIPs
- **February 2014:** Anticipated Nonattainment Area SIP Due Date
- **August 2017:** Anticipated Attainment date for Nonattainment Areas
 - EPA guidance suggests this is also an appropriate attainment date for unclassifiable areas submitting Section 110(a)(1) attainment/maintenance SIPs

Section 110(a)(1) SIPs

- Submittal due by June 2013 (3 years after promulgation of the NAAQS)
- Should demonstrate attainment of the standard as expeditiously as practicable, which should be within 5 years of the effective date of designation, or by August 2017
 - This is consistent with the attainment dates required for nonattainment areas under Part D, Subpart 5 of the CAA.
- Should demonstrate (using air quality dispersion modeling) attainment for any source, or groups of sources, that the Regional Administrator or state determines may be anticipated to cause or contribute to a violation of the NAAQS
 - However, counties that do not have SO₂ sources, or any large SO₂ sources, may be able to use a non-modeling technical demonstration to show the county or a portion of the county attains the NAAQS. (Appendix C of draft guidance)

Section 110(a)(1) Plan Elements

- The SIP submittals should contain the following elements:
 - An attainment demonstration (using air quality dispersion modeling or, in some cases, a non-modeling technical alternative consistent with EPA modeling guidance)
 - An appropriate emissions inventory for the time period of the attainment demo
 - An appropriate control strategy for the affected area
 - enforceable limits to assure that sources located in these areas that are causing or contributing to a violation will be sufficiently controlled to ensure timely attainment of the NAAQS
 - timetables for compliance, and appropriate testing/reporting information to assure compliance
 - A contingency plan
 - A plan for verification of continued attainment

Control Strategy for Attaining the 1-Hour SO₂ NAAQS

- Several forthcoming national and regional rulemakings will likely result in significant reductions of SO₂ emissions over the next several years
 - These rules include the Transport Rule, the Boiler MACT rule, and the Mercury and Air Toxics Standard (MATS)
- These rules are expected to result in the installation of controls at many of the largest SO₂ sources to meet emissions limits that will help to ensure attainment and maintenance of the 1-hour SO₂ NAAQS
- States will be able to incorporate these controls into the SIPs for SO₂; however, states will need to adopt emission limits to be consistent with the form of the 1-hour SO₂ NAAQS

The SO₂ Nonattainment SIP Submittal

- For areas that are designated nonattainment, states are also expected to submit SIPs which demonstrate attainment using refined air quality dispersion modeling
- States are directed by the CAA to submit these SIPs within 18 months of the effective date of designation; based on the anticipated schedule for designations, SIPs would be due by February 2014
- We anticipate the attainment date for nonattainment areas to be by August 2017, no later than 5 years after designation
- The requirements for nonattainment area SIPs are the familiar requirements from Part D of the Clean Air Act (Sections 172 and 191-192), listed in the guidance

Redesignation Criteria for SO₂ Areas

- For areas designated as nonattainment EPA would apply the redesignation criteria as stated under section 107(d)(3) of the CAA
These criteria are the following:
 - EPA has determined that the area has attained the NAAQS:
 - This requirement would be satisfied if valid air quality dispersion modeling, and any available monitoring data indicate that the standard is attained
 - EPA has fully approved the part D SO₂ SIP for the affected area
 - The improvement in air quality in the affected area is attributed to permanent and enforceable emissions reductions
 - All SIP-adopted control measures would need to be fully implemented to satisfy this requirement
 - EPA has fully approved a maintenance plan as required under section 175A of the CAA
 - The area has met all other applicable requirements of section 110 of the CAA.
- Draft criteria for unclassifiable areas are based on these but with appropriate variations (e.g., no 175A maintenance plan)

Section 110(a)(2) Infrastructure SIP Elements

- Following the promulgation of any new or revised NAAQS, states must also submit a SIP within 3 years which addresses the infrastructure elements A-M of section 110(a)(2)
- We have provided detailed guidance (Appendix B) that lists the elements and describes how states should address the section 110(a)(2) infrastructure elements in their submittal
- We have developed this guidance in concert with the guidance being developed for the other pollutants (Pb, NO₂, O₃, CO, and PM 2.5) so that the guidance is consistent

Modeling Guidance for 1-Hour SO₂ NAAQS

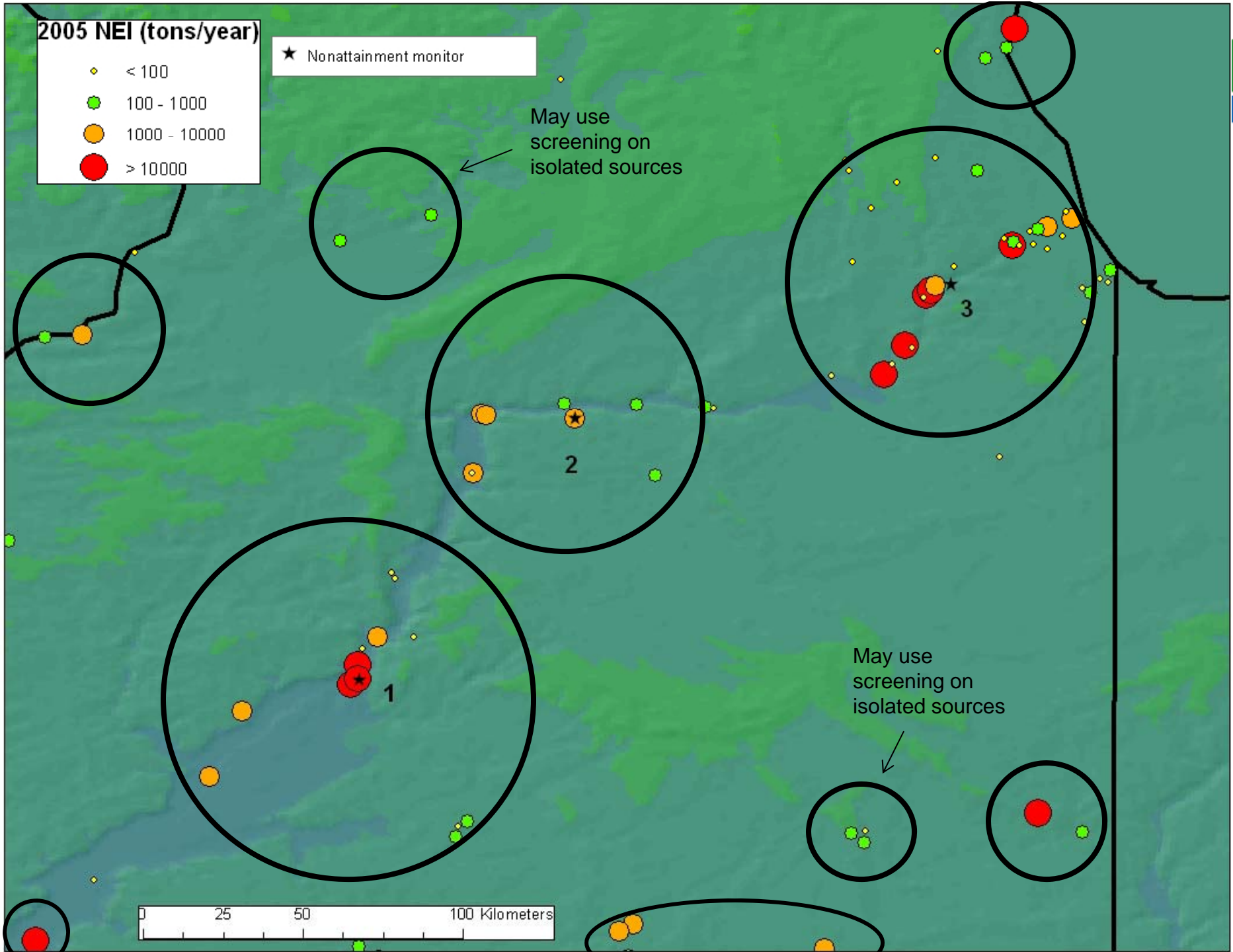
- The modeling guidance (Appendix A) addresses attainment demonstration modeling for both section 110(a)(1) SIPs and nonattainment areas SIP required under part D, subpart 5 of the CAA
- The modeling guidance includes the following topics:
 - Model selection: AERMOD is EPA's preferred near-field dispersion model.
 - While attainment demo would need to address all SO₂ emissions in the area, it need not explicitly model all sources of SO₂
 - Focus modeling on largest sources (see next slide)
 - Use of screening modeling to assess smaller and/or relatively isolated sources
 - Use of background concentrations to account for some sources in refined modeling

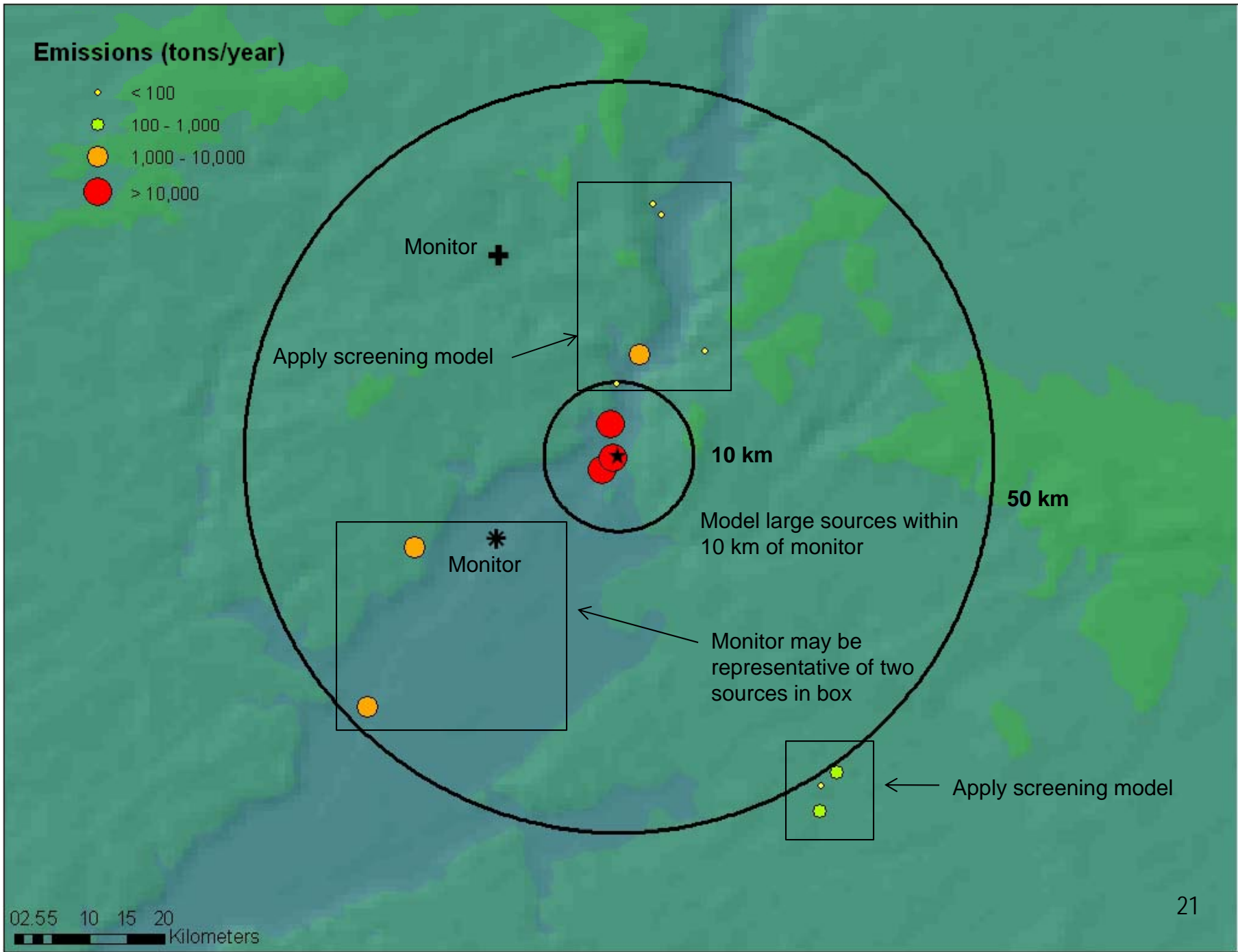
Sources to Model: SO₂ Threshold Level

- Possible to exclude smaller sources from modeling, as appropriate
 - Guidance suggests a threshold level to indicate a minimum universe of SO₂ sources to model in the attainment demonstration for the SIP. Specifically, is an actual emissions threshold level of 100 or more tpy of SO₂ appropriate to help states better focus their limited modeling resources on sources that are likely to cause or contribute to a 1-hour SO₂ NAAQS violation and impact the most populated areas?
 - Reasonable because focusing state modeling on point sources emitting 100 tpy or more of SO₂ emissions would account for over 99% of all NEI reported emissions (2008 NEI).
 - Some smaller sources may also cause or contribute to violations of the 1-hour SO₂ NAAQS (i.e., sources with short stacks and/or located in complex terrain). In cases where this is true, the states should add these sources to the attainment demonstration
 - Similarly where a source's recent actual emissions are below 100 tpy but allowable emissions are far higher it may be advisable to include that source in the analysis

Sources to Model (Continued)

- States should also use best professional judgment, or act in consultation with Regional Office modelers, to determine emissions threshold and other considerations for mapping
- Compare source locations and SO₂ monitor locations to identify any geographic clusters as potential modeling domains
 - Nonattaining monitors or large sources can be center of potential modeling domain
- Once a source is included in the analysis, attainment modeling would still be based on maximum allowable emissions





Modeling Guidance for 1-Hour SO₂ NAAQS

- Additional topics in Modeling Guidance:
 - Calculation of short term emission rates
 - Intermittent emissions (refers to March 1, 2011 memo)
 - Modeling control strategies
 - Can account for controls from upcoming national rules (CSAPR, MATS and Boiler MACT Rule)
 - GEP stack heights
 - Meteorological inputs
 - Inclusion of representative monitored background concentrations and calculation of background concentrations
 - Use of modeling to determine attainment status (design values) for areas
 - Documentation of requirements
 - Several additional technical topics

PSD Permitting for 1-hour SO₂ NAAQS

- PSD for 1-hour SO₂ took effect with finalization of NAAQS
 - Note that annual and 24-hour increments still apply per statute
- Some stakeholders have been expressing concerns about ability of new/modified sources to show compliance with the 1-hour SO₂ NAAQS
- Recent EPA guidance (August 23, 2010) has addressed this topic
 - March 1, 2011 NO₂ guidance discussing treatment of intermittent emissions also relevant
- We are interested in understanding whether this guidance addresses the concerns or whether further guidance is needed to highlight additional areas of flexibility
 - We are especially interested in specific examples states are seeing
 - Will be a key topic at next EPA-sponsored modeling conference (March 2012)

Next Steps

- Continued engagement with States on issues in guidance
 - What issues are States seeing in their modeling?
 - Is further guidance needed to highlight additional flexibility? Specific suggestions?
 - Other suggestions on approach described in guidance?
- Review comments on guidance and issue revised guidance as soon as possible
- Continue development of implementation rule proposal; incorporate ideas from comments into rulemaking proposal
- Propose implementation rule for comment soon after comment period on guidance is concluded; schedule not yet established
- Issue final implementation rule as soon as possible