

Implementation of the 2010 Primary 1-Hour SO₂ NAAQS

Draft White Paper for Discussion

I. Overview

The purpose of this paper is to facilitate input from states, tribes, and other interested stakeholders on EPA's implementation of the primary 1-hour sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS). In particular, this paper focuses on the determination of whether the air quality in a given area currently meets the NAAQS. This determination occurs primarily in the context of designating areas as attainment, nonattainment, or unclassifiable; and in the context of redesignating areas from nonattainment, attainment, or unclassifiable to another status. EPA anticipates that some combination of enhanced ambient monitoring and technically credible dispersion modeling (the combination of which we refer to as a "hybrid approach") is likely needed to make this determination in these contexts. To identify a workable approach, EPA is soliciting stakeholder input on how best to determine whether an area attains the SO₂ NAAQS (e.g., by defining and establishing a robust, representative monitoring network for SO₂ across the country, and/or by applying an appropriate modeling approach). EPA is also soliciting input on how best to implement such an approach (e.g., implementation options and SIP timelines for areas in which violations may be identified). This paper addresses these topics and poses several "charge" questions intended to focus upcoming stakeholder discussions.

In EPA's final SO₂ NAAQS preamble and subsequent draft guidance in March and September 2011, EPA expressed its expectation that many areas would be initially designated as unclassifiable due to limitations in the scope of the ambient monitoring network and the short time available before which states could conduct modeling to support their designations recommendations due in June 2011. In order to address concerns about potential violations in these unclassifiable areas, EPA recommended that states submit substantive attainment demonstration SIPs based on air quality modeling by June 2013 (under Clean Air Act section 110(a)(1)) that show how their unclassifiable areas would attain and maintain the NAAQS in the future. As discussed below, commenters raised concerns with this approach, and we believe it is appropriate to further discuss potential implementation options. Thus, EPA recently wrote to state environmental commissioners and tribal leaders explaining that, for the time being, we intend to move forward with the process of designating areas under the NAAQS, but that we are no longer recommending that demonstrations showing future attainment in unclassifiable areas be included in 2013 SIP submittals.

Nevertheless, EPA recognizes that, despite its current plans to move ahead expeditiously with nonattainment designations focused on areas with sufficient ambient air quality data, there will still be large portions of the country initially designated as unclassifiable, and there may be NAAQS violations in those areas. As we discuss the monitoring and modeling-based approaches in this paper for determining SO₂ concentrations, EPA is also interested in discussing the future use of this information in resolving the unclassifiable status of areas of

concern by affirmatively redesignating such areas as either attainment or nonattainment. EPA is interested in whether this kind of approach would satisfactorily address concerns about unclassifiable areas, or whether other approaches to NAAQS implementation in such areas should be explored (e.g., affirmative planning requirements to identify and correct NAAQS violations in unclassifiable areas).

Finally, we note that the initial nonattainment designations will trigger planning requirements for those areas. EPA expects to provide assistance to states in implementing these nonattainment area requirements, but this document is not focused on identifying or resolving issues that may arise in developing SIPs showing future attainment of the NAAQS. We plan to provide separate guidance or rulemaking on attainment planning as soon as possible. Nevertheless we expect that these discussions could serve as an opportunity to identify such issues and inform our future efforts.

II. Introduction

In June 2010, EPA promulgated a revised primary SO₂ NAAQS, designed as a new 1-hour standard. In the preamble to the final rule, EPA included a discussion of a possible implementation approach for the standard that differed in some ways from NAAQS implementation approaches taken for other pollutants. Specifically, EPA discussed a possible hybrid implementation approach that would rely on both monitoring and modeling data for the purposes of designating areas as being in attainment or nonattainment of the standard, to the extent states had time and were able to develop such data in time to inform their designations recommendations. The approach further addressed unclassifiable areas, which were expected to cover an extensive portion of the country, by recommending that states would submit SIPs showing future attainment of the NAAQS, not just for designated nonattainment areas but also for unclassifiable areas. Following this, in March and September 2011, EPA issued guidance on designations and SIP planning for the SO₂ NAAQS, asking for comment on the latter. Since that time, EPA has heard from a number of states and other stakeholders who have expressed concern with several aspects of EPA's proposed implementation approach.

On April 12, 2012, EPA announced in letters to state environmental commissioners and tribal leaders that it intends to move forward with the designations process as quickly as possible, focusing on areas with sufficient ambient air quality data. Because we still expect this process will result in significant portions of the country being initially designated as unclassifiable, we also announced we would initiate a stakeholder engagement process to consider and discuss possible alternative implementation options to those described by EPA in the preamble to the final NAAQS and subsequent guidance documents. As discussed above, this document focuses on addressing future-designated unclassifiable areas by developing approaches to modeling and/or monitoring that would enable EPA to affirmatively determine whether or not areas of concern are attaining the NAAQS. EPA also communicated in the April 2012 letters that we expect all states by June 2013 to submit SIPs meeting the "infrastructure" SIP requirements under section 110(a)(2) of the Clean Air Act. However, given that we are undertaking a stakeholder outreach process to continue to develop possible approaches for

determining attainment with the SO₂ NAAQS, we made it clear in the April announcement that we do not expect states by June 2013 to submit substantive CAA section 110(a)(1) attainment demonstration SIPs for unclassifiable areas.

Distributing this paper will facilitate the process for obtaining stakeholder input. The paper describes concepts and discusses possible approaches for determining whether areas across the country are attaining the 1-hour SO₂ NAAQS. Appendix A provides basic information about the current population of SO₂ sources across the country, SO₂ emissions from these facilities, and the current SO₂ monitoring network. We anticipate that the ideas contained in this paper will provide a basis for productive discussions with stakeholders as we explore approaches to ensure attainment of the 1-hour primary SO₂ NAAQS, increase public health protection, and achieve continued improvement in air quality across the country through SO₂ emissions reductions.

III. Background

In the proposal for the SO₂ NAAQS (74 FR 64810, December 8, 2009), EPA outlined a possible implementation approach for the NAAQS that, similar to implementation approaches for other criteria pollutant NAAQS, would have relied primarily on monitoring for determining attainment of the standard. The proposal discussion did not address how EPA has historically made significant use of modeling in implementing the prior daily and annual SO₂ NAAQS. During the public comment period, EPA heard from a number of commenters that the means of determining whether areas are either in attainment or nonattainment for the new standard described in the proposal were not appropriate or feasible. Specifically, numerous state and local government commenters expressed concerns regarding the perceived burdens of implementing the proposed monitoring network and the sufficiency of its scope for purposes of identifying violations. Some of these commenters suggested using modeling to determine the scope of monitoring requirements, or favored modeling over monitoring to determine attainment status. Partly in response to these comments, and after reconsidering the proposal's monitoring-focused approach, specifically regarding how EPA has historically determined SO₂ attainment status¹, the preamble to the final rule described how we anticipated using a hybrid analytic approach towards designations that combines the use of monitoring and available modeling to determine attainment with the new 1-hour SO₂ NAAQS (75 FR 35570). We also discussed the use of section 110(a)(1) of the CAA as the mechanism for states to submit substantive attainment and maintenance SIPs for areas initially designated as unclassifiable.

In the preamble to the final NAAQS, we provided preliminary rationale for the possible hybrid monitoring/modeling approach. We explained that this approach could better address several potentially problematic issues than would the narrower monitoring-focused approach discussed in the proposal for the SO₂ NAAQS, including the unique source-specific impacts of

¹ The final rule preamble (75 FR 35551) describes EPA's historic use of modeling in determining attainment for the SO₂ standard. This discussion – and the documents referenced therein – may be helpful background for discussing possible improved approaches.

SO₂ emissions and the special challenges SO₂ emissions have historically presented in terms of monitoring short-term SO₂ levels for comparison with the NAAQS in many situations (75 FR 35550). We noted that we anticipated that many areas would be designated “unclassifiable,” due to the short time period available to generate monitoring and/or modeling data before state designations recommendations were due under the CAA. We also explained that to ensure that all areas of the country attain the NAAQS on a timely basis, EPA intended to emphasize the CAA section 110(a)(1) requirement that all states submit SIPs that show implementation, maintenance, and enforcement of the NAAQS in unclassifiable areas (75 FR 35573). These plans were to take into account anticipated future SO₂ reductions from major rules such as the 2011 Cross-State Air Pollution Rule (CSAPR), the 2011 Mercury and Air Toxics Standards (MATS), and the reconsidered boiler MACT rules; and they were to be informed by updated modeling guidance. We also committed to soliciting public comment on guidance regarding modeling and on additional implementation planning guidance, including the content of the attainment and maintenance plans that would be submitted under section 110(a) of the CAA.

On March 24, 2011, EPA issued guidance to states for making initial area designation recommendations. As part of the guidance document, we described our intended approach at that time for making initial area designations based generally on a determination that relied on a combination of both monitoring and, as available, modeling data. We reiterated that many areas would need to be designated initially “unclassifiable” due to a lack of either monitoring and/or modeling data. The guidance included a detailed attachment addressing how modeling could be conducted to support initial designations, if a state chose to do so. We also noted that we were preparing separate guidance on developing SIP revisions for the SO₂ NAAQS, and that we intended to seek public comment on the draft guidance document.

On September 22, 2011, we released the draft guidance on SIP submissions, which included further guidance on air quality modeling for nonattainment areas and on developing attainment demonstrations under section 110(a) for unclassifiable areas. We also provided further rationale for considering a hybrid monitoring/modeling approach for implementing the new 1-hour primary SO₂ NAAQS. For areas initially designated as unclassifiable (i.e., areas without sufficient monitoring/modeling data to show nonattainment or demonstrate attainment), the draft guidance recommended that states submit substantive CAA section 110(a) SIPs that show how they would attain and maintain the NAAQS in the future. Because we are undertaking discussions that would affect this approach, we announced in letters to state environmental commissioners and tribal leaders in April 2012 that we no longer recommend such submittals.

IV. Issues

A. Key comments from stakeholders

EPA has received comments on SO₂ NAAQS implementation from state, local, and tribal governments; environmental groups; and industry stakeholders in several settings since we

issued the final SO₂ NAAQS in June 2010. The public comment period for the September 2011 draft guidance for SIP submissions offered an opportunity for stakeholders to provide detailed written comments on the proposed 1-hour SO₂ NAAQS implementation approach. In light of these comments, we present concepts in this paper for further exploration in upcoming stakeholder discussions. Stakeholder concerns generally related to one or more of the following aspects of the proposed approach:

1. Difficulty in meeting the suggested approach for attainment demonstrations and in demonstrating attainment everywhere based on air quality modeling, especially in multi-source areas;
2. Time and resource burden associated with conducting attainment demonstration modeling and establishing new control requirements for significant SO₂ sources located outside of designated nonattainment areas by June 2013; and,
3. Legal and policy objections to EPA's authority to expect modeling-based attainment demonstrations to satisfy the CAA section 110(a)(1) "implementation, enforcement, and maintenance" requirement for areas designated unclassifiable, especially in areas where nearby monitors indicate no exceedances.

More specifically, comments from states and other stakeholders asked that we reassess what may be reasonable for implementing the 1-hour primary SO₂ standard. First, some commenters have suggested that we may have underestimated the resources needed for widespread modeling, analysis, and rule development that may be necessary to follow our recommendations regarding CAA section 110(a) SIPs. This concern is compounded by the level of effort that would be necessary by June 2013 to model emissions from numerous sources of SO₂ located across the country in order to support such submittals.

Second, many commenters have asserted that modeling attainment is difficult due to the purported conservative nature of modeling, even in areas that are not monitoring violations. For example, modeling ambient SO₂ concentrations at a large number of receptor locations across an area may provide a more "conservative" assessment of ambient levels than a single or limited number of ambient monitors, especially when maximum allowable emissions are modeled.

Third, commenters have stated that the time discussed under the proposed approach for states to submit SIPs and demonstrate attainment is generally insufficient. Commenters claim this is especially true for unclassifiable areas, where, despite the large geographic scope and number of sources, the SIP submission deadline under CAA section 110(a) is actually sooner than would be the deadline for nonattainment areas under CAA section 191(a). While a few commenters expressed concern about nonattainment area planning requirements, the majority expressed concerns about the burden of developing SIPs for unclassifiable areas.

B. EPA's evaluation of comments and understanding of the issues

Many commenters have asserted that the proposed implementation approach involving CAA section 110(a)(1) SIPs could place more burden on states to address areas designated

unclassifiable than to address areas with other evidence of a NAAQS violation. In recognition of these concerns, we have identified potential approaches that place priority on addressing nonattainment area problems first (consistent with traditional NAAQS implementation efforts), while also addressing unclassifiable areas over the longer term to ensure these areas also attain the SO₂ NAAQS and achieve appropriate public health protection. The potential approaches focus on how to determine current attainment, rather than future attainment, in order to consider whether a more workable approach can be developed that significantly reduces the extent of unclassifiable areas, identifies and addresses sources of concern that are causing NAAQS violations, and avoids the issues that gave rise to many of the concerns expressed about the suggested CAA section 110(a) approach.

The options presented below are presented for the purpose of eliciting further comment and discussion with stakeholders, but should not be considered as limiting the range of options that could be discussed, nor as endorsing or rejecting any particular idea at this time.

V. Implementation Concepts and Issues for Consideration

After considering the comments received on the September 2011 draft guidance, we have identified for further discussion two conceptual approaches for addressing the many areas still expected to be initially designated “unclassifiable” for the 1-hour NAAQS. While this document provides a general outline of the approaches, there are several issues and key questions which need to be addressed before revised implementation guidance (or rules, if necessary) can be developed. These issues and key questions will be the focus of the stakeholder discussions.

For most air pollutants, EPA relies on ambient monitoring data for determining whether an area is currently attaining the NAAQS. The same approach could be taken to address the 1-hour SO₂ NAAQS by pursuing an adequately updated and expanded monitoring network to collect ambient air quality data. Such an approach would be conceptually similar to our implementation approach for other NAAQS in that it would rely on ambient monitoring data to evaluate air quality, serve as the basis for initial area designations (if developed on time), and inform ongoing compliance with the NAAQS. Although EPA originally proposed an expanded monitoring network, in the preamble to the final SO₂ NAAQS we recognized that the proposed network might not be sufficiently expansive and discussed the potential resource burden of establishing a sufficient monitoring network in light of the unique source-specific impacts of SO₂. Subsequently, some stakeholders asserted that the hybrid modeling/monitoring approach we proposed in response to this concern could also be overly burdensome. Thus we are exploring alternative monitoring and modeling approaches to adequately measure air quality and protect public health.

A. Monitoring Options

Under a monitoring-focused approach, the question turns to the nature of a potential monitoring network for implementing this NAAQS. A map of the current national SO₂

monitoring network is provided in Figure 1. Currently, there are about 440 monitors in operation around the country, with not more than 1/3 being source-oriented or at high concentration sites. As such, it is likely that a significant reallocation of monitors in the existing network plus expansion of the number of monitors in the network would be necessary to determine whether national ambient SO₂ levels are meeting the NAAQS and protective of public health under a monitoring-focused approach. However, it might not be necessary or feasible to expect monitoring for every single SO₂ source in the country.

Figure 1



There are two alternatives introduced in this paper for expanding the SO₂ monitoring network: (1) a national network reallocation and expansion and (2) a population-focused reallocation and expansion.

1. National Network Reallocation and Expansion

As previously stated, not more than 1/3 of the current monitoring network is situated to characterize sources with high SO₂ emissions. It may be appropriate to focus the monitoring network on the major sources of SO₂ emissions across the country. EPA could establish through rulemaking an SO₂ emissions threshold above which an SO₂ monitor would be installed. For example if a threshold of 2,000 tons of SO₂ per year (tpy) were deemed appropriate, that would address close to 600 of the SO₂ sources in the country, or 93% of the emissions. The monitors in the current network could be reallocated to the identified sources, and new monitors could be installed and operated at the remaining sources. This alternative could provide a

straightforward approach to implementing the SO₂ NAAQS and at the same time provide a more robust monitoring network across the country.

2. Population-focused Reallocation and Expansion

A second alternative could resemble the current minimum monitoring requirements discussed in the final SO₂ NAAQS rule using the population weighted emissions index (PWEI) based on population and emissions inventory data at the core-based statistical area (CBSA) level. This approach would assign a required number of monitors for a given CBSA based on relevant factors such as population and SO₂ emissions in the area.² The PWEI index provides an indication of population weighted exposure, and can help EPA and states prioritize limited monitoring resources with an emphasis on public health protection.

To identify priority locations at which to site monitors in these PWEI areas, an SO₂ emissions threshold could be used to focus the placement of monitors around the higher SO₂ emissions in the PWEI areas. For example, a threshold of 750 tpy would provide for monitoring of approximately 400 sources in those PWEI areas responsible for 56% of the SO₂ emissions. In addition, to monitor air quality near the largest sources of SO₂ that are located in areas not covered by the population-oriented PWEI approach, an emission threshold could be set to prioritize the location of an additional set of monitors outside of the PWEI areas. For example, deploying monitors near sources with emissions over 5,000 tpy would approximately address an additional 170 sources outside of the PWEI areas and 34% of SO₂ emissions. This approach would allow states to focus their resources in areas with the highest risk to public health and with the largest sources of emissions. Under this example, the resulting minimum network would consist of over 550 sites nationwide and would provide monitoring of sources responsible for 90% of the total national emissions.

3. Other Alternatives and Considerations

In addition to the alternatives presented above, there are other threshold alternatives EPA could consider. EPA could select thresholds based on annual emissions at various levels (see Appendix). EPA could also consider selection of thresholds based on hourly emissions, but for most sources, hourly data are much more limited. EPA could also consider screening out sources based on thresholds that take into account not only a source's SO₂ emissions, but also the source's characteristics (e.g., stack height, source configuration, etc.). Another alternative may be a tiered approach, where states would monitor sources with emissions above a high threshold and then have a range of options for assessing air quality at sources with emissions in a given range below that threshold, or vice-versa.

² The PWEI for a particular CBSA was proposed to be calculated by multiplying the population (using the latest Census Bureau estimates) of a CBSA by the total amount of SO₂ emissions in that CBSA. The CBSA SO₂ emission value would be in tons per year, and calculated by aggregating the county level emissions for each county in a CBSA. We would then divide the resulting product of CBSA population and CBSA SO₂ emissions by 1,000,000 to provide a PWEI value, the units of which would be millions of people-tons per year.

For any source-focused monitoring alternative, the question arises as to how many monitors are needed to characterize the air quality around an SO₂ source. EPA is considering establishing approaches that would allow sources to be characterized by just a few monitors, or, if appropriate, a single properly-sited monitor. Under such approaches, modeling (or other analyses – e.g., examination of wind roses, identification of sensitive receptor locations, assessment of nearby terrain features, and estimation of distance of maximum impacts) would likely need to be completed to site these monitors at the areas of highest concentration. This modeling might be less resource intensive than attainment demonstration modeling, but would require resources to complete the analysis.

In addition to any potentially revised monitoring network, as with all other NAAQS monitoring requirements, EPA Regional Administrators and states would have the authority to require additional monitoring in certain circumstances, such as in areas impacted by major industrial point sources or a combination of sources that are not required to monitor under the other monitoring provisions. Also, attention should be given to the need to collect site-specific meteorological data, as well as ambient SO₂ data, in order to support data analyses (e.g., generation of pollution roses) and, if necessary, dispersion modeling.

Pursuing any of these approaches could require EPA to make revisions to the SO₂ monitoring regulations to address revised monitoring requirements, including any new requirements based on appropriate emissions thresholds.

4. Key Questions

In order for EPA to determine the feasibility of using monitors principally to determine attainment or nonattainment of the standard, stakeholder input is needed on the following key questions:

- a. Are the conceptual monitoring networks described above sufficient to determine whether ambient SO₂ levels meet the NAAQS and are protective of public health without the need for additional modeling? If not, then what enhancements should be made to them? In what situations should meteorological data collection also be required?
- b. What is an appropriate number of monitors to site around a source to assess air quality?
- c. Is it reasonable for states to consider relocating monitors within their states? What are potential barriers to relocation (e.g., cost, agreement with local community)? Is it reasonable for states to consider transferring their monitors to other states?
- d. What kind of modeling (or other analyses) would be necessary to identify the location of maximum impact? What information and resources are necessary to

complete such modeling? What is a reasonable schedule for completing this modeling?

- e. What options exist for paying for the expanded SO₂ monitoring network? Would stakeholders be willing to conduct monitoring at new locations, or provide funding to assist states in conducting such monitoring? If so, what type of agreement would be needed between states and stakeholders to ensure the monitoring would be done?
- f. For potential stakeholder operated monitors, what kind of oversight would the states need to perform? Would EPA perform additional oversight? Would someone audit these facility monitoring programs and associated monitors? What type of agreement would be needed between the states and stakeholders to insure the monitoring was carried out? How can we best ensure that these data are made public (e.g., require submittal to AQS)?

B. Modeling Options

The monitoring alternatives discussed above would identify a set of priority sources for monitoring. In recognition of the limitations of monitoring to identify high concentrations in the vicinity of SO₂ sources and the resource burden associated with establishing a robust monitoring network, EPA believes that modeling may need to be used to supplement or in lieu of monitoring where appropriate. States may prefer to model instead of monitor at sources where modeling is technically straightforward (e.g., consistent with the design of the model) and if they do not have enough resources to install the number of needed monitors. At the same time, EPA recognizes that modeling these sources may also impose additional resource burdens on states, and modeling may not be appropriate in some situations.

Under the modeling alternative, states could model the sources that otherwise would have required one or more monitors under potentially revised minimum monitoring requirements. This modeling would use the AERMOD dispersion model, and EPA is exploring several options for the emissions levels that would be modeled to characterize current air quality, including: (1) actual emissions, where states would need to provide some ongoing assurance that the area's current air quality is being evaluated against the NAAQS similar to monitoring (in addition to assurance that results are not inappropriately affected by dispersion), and (2) allowable source emissions (e.g., federally enforceable permit limits or potential to emit). Recognizing the stakeholder interest in modeling actuals, EPA could develop approaches for states to provide this assurance by (1) setting enforceable emission limits for the sources equal to their actual emissions such that future levels would be no worse than current actuals, (2) periodically modeling levels of actual emissions to continue to ensure they are not violating the NAAQS, and/or (3) periodically reporting on whether the sources' actual emissions have increased relative to the prior modeling assessment, and in cases where the emissions increase has created the potential for violation of the NAAQS, completing additional modeling to determine whether the higher emissions level resulted in a modeled violation in

the area or in an affected area. Other technical modeling issues which need to be addressed include receptor placement, the spatial extent of the modeling, which other nearby sources need to be modeled, estimating background concentrations, and use of site-specific versus National Weather Service meteorological data.

In addition, it may be necessary to ensure that actual and allowable emissions for these sources are not inappropriately affected by dispersion techniques, such as stack heights greater than those considered within the limits of good engineering practice (GEP). Moreover, in situations where it is found, perhaps through New Source Review (NSR) or Prevention of Significant Deterioration (PSD) modeling, that existing, new or modified sources in designated attainment or unclassifiable areas would cause NAAQS violations, EPA and states could act to revise the SIP through developing further emissions limits and a new demonstration of future attainment. Any thresholds set forth in a potentially revised monitoring rule could also apply to modeling requirements.

For states that have unmonitored areas with no SO₂ sources, Appendix C in the September 2011 draft guidance discusses an example of a possible non-modeling option that could allow them to demonstrate attainment without needing to complete modeling. This, or variants on it, could also be considered under this option.

EPA recognizes that some of the issues discussed here may also be relevant to attainment demonstration modeling for nonattainment SIPs and may come up in stakeholder discussions and be relevant for consideration in future attainment planning guidance.

1. Key Questions

In order for EPA to evaluate the feasibility of using modeling in conjunction with monitoring to determine either attainment or nonattainment of the standard, stakeholder input is needed on the following key questions:

- a. Should some criteria (e.g., the PWEI concept) be used to identify priority sources to be modeled in an area where there is no nearby monitor?
- b. How should the modeling be performed – i.e., what changes to the March 24, 2011 guidance should be made, such as the use of size cut-offs and use of actual emissions?
- c. Are there situations where modeling is preferable to monitoring? If so, then what are these situations? Should EPA require modeling in certain situations, or is monitoring alone always a sufficient option for areas of concern?
- d. Are there situations where monitoring is preferable to modeling? If so, then what are these situations? Should EPA require monitoring in certain situations, or is modeling alone always a sufficient option for areas of concern?

- e. What options exist for paying for the new modeling analyses? Would stakeholders be willing to conduct, or provide funding to assist states in conducting, any new modeling? If so, what type of agreement would be needed between states and stakeholders to insure modeling would be done?

C. Implementation Options

Regardless of the attainment determination approach that is ultimately used in a given context, EPA intends to move forward with proposing nonattainment area designations focused on areas with sufficient ambient air quality data. As noted above, this will trigger planning requirements, the implementation of which is important, but is not the primary focus of this document.

Nevertheless, it is important to consider how best to implement expeditiously whatever improved approach EPA ultimately recommends for unclassifiable areas. It is possible that an initial step could be issuance of EPA guidance or rulemaking adopting minimum monitoring/modeling/hybrid requirements for determining attainment. There would then likely be some state adoption or approval process, followed by the deployment or redeployment of monitors and/or the conducting of modeling to determine which areas are attaining and which are not. The timing of these actions is an important discussion topic, and involves consideration of the practical realities of enhancing the ambient monitoring network (such as cost, timing, etc.) and conducting necessary modeling, as well as the importance of being able to use the new approach to determine as expeditiously as practicable whether there are NAAQS violations occurring. Appropriate timing for these actions will need to be discussed in the context of the approach that EPA recommends (e.g., how many monitors, schedule for deployment, data collections, etc.).

Under a monitoring-focused alternative, an area designated unclassifiable might either have no monitor, or it may have a monitor or monitors that do not show violations of the NAAQS at the time of designation. Following designation, states with unclassifiable areas might be required by revised rules to site new monitors or relocate existing monitors. EPA could also potentially direct states (through rulemaking or other procedures, such as SIP Calls) to submit a plan for siting the monitors required by a revised monitoring rule, including requiring modeling (or other analyses) to demonstrate the appropriate placement of the monitors. Any data ultimately collected by the comprehensive monitoring network could be used, as appropriate, for area redesignations or for any necessary future SIP calls.

EPA recognizes that any approach that would depend on the siting of additional monitors could impose additional resource burdens on states in order to install, maintain, and operate those devices. We acknowledged this issue in the preamble to the final SO₂ NAAQS, in which we indicated that EPA and states may not have adequate resources to site sufficient monitors to properly characterize air quality around major SO₂ sources. Therefore, an alternative that would rely upon expanding the SO₂ monitoring network deserves further discussion with stakeholders. In particular, EPA would like to consider potential means of alleviating some of the cost burden on states, for example by having sources cover capital costs

and/or operating costs for monitors in their areas. Considering the importance of monitoring the ambient air around these sites and continuing state budget concerns, states might reasonably expect sources to work jointly with the appropriate state or local agency to install and operate these monitors. The source and the state would need to work together in siting the monitors and analyzing the data, which could then be reported to states and to EPA.

Regarding the role of modeling, as noted above, EPA recognizes that modeling may also present resource burdens on the states. Under a modeling alternative, modeling could, for example, be completed for sources identified by minimum monitoring requirements but for which monitors were not deployed. Some consideration would need to be given to when this modeling would need to be completed. Similar to a potential monitoring network, the modeling could be done in a phased approach, having states model first the sources in areas with the highest population or some other determinant of greatest public health risk. There may also be cost burdens on the states associated with data collection, such as more representative meteorological data. Considering the potential importance of a modeling option in some locations and continuing state budget concerns, states might reasonably expect sources to work jointly with the appropriate state or local agency to both collect the necessary data, but also perform some or all of the modeling analysis.

Whatever approach is developed (e.g., monitoring-focused, modeling-focused, or allowing states flexibility to determine whether to use monitoring and/or modeling), there are practical considerations about how quickly monitors can be deployed and modeling can be completed. Depending on the significance of the changes being made, a phased-in approach may well be warranted. This phased approach could require the first monitors to be sited (or the first modeling to be conducted for sources) in areas with the highest population, highest emissions, or some other determinant of greatest public health risk.

Finally, EPA will need to decide on requirements regarding what SIP revisions will be needed to carry out the new approach. As referred to above, one approach would be to amend the minimum requirements for monitoring networks (and any modeling requirements as part of a hybrid approach), specify the appropriate deadlines, and then act promptly on that data to identify any new NAAQS violations in unclassifiable areas and redesignate those areas to nonattainment, or do a SIP call for those areas. This approach is straightforward and most closely resembles our approach to implementing other NAAQS. Nevertheless, some stakeholders suggested that we should explore approaches that do not involve additional nonattainment designations. For example, EPA could allow states to remedy violations in unclassifiable areas by demonstrating attainment before a redesignation occurs. Instead, EPA could build in affirmative requirements for unclassifiable areas to discover and correct violations, similar to the original approach we previously recommended (but did not require) for demonstrating attainment under CAA section 110(a)(1). Alternatively, EPA could try to integrate such unclassifiable requirements into permitting actions (e.g., title V renewals) already happening in these areas.

1. Key Questions
 - a. In what form should EPA set forth the revised approach? Would rules need to be revised? Which ones? How should states adopt the new approach, and how much time is needed for this?
 - b. What is a reasonable schedule for 1) designing a sufficient monitoring network; and 2) deploying a new monitor or moving a monitor from an existing location? (What can be done to initiate monitoring as quickly as possible to collect sufficient data to make attainment/nonattainment determinations?) Is a phased approach useful?
 - c. By what date should the modeling be completed and submitted to EPA? Is a phased approach useful?
 - d. Once the modeling/monitoring data are in, how should states and EPA use these data to address violations in unclassifiable areas? Is redesignating the most workable approach? What should be the timing for these redesignations? Is the timing of the next SO₂ NAAQS revision a consideration?
 - e. Alternatively, should EPA consider approaches to identify and address violations in unclassifiable areas that do not involve redesignating these areas as “nonattainment”? Which alternative approaches are most promising?
 - f. Is it possible to develop an attainment determination approach that provides reasonable assurance that sources of concern that are causing violations will be identified and addressed?
 - g. How should EPA address unclassifiable areas with no emissions or shown to have no monitored or modeled violations? What requirements, if any, are appropriate to support designating these areas as attainment? Is this necessary?

VI. Comments

Additional information concerning the stakeholder process and opportunities to provide comments can be found on the following website:

<http://www.epa.gov/air/sulfurdioxide/implement.html>

APPENDIX A**SO₂ Emissions**

	Number of Sources	Total Emissions	Percent
All SO ₂ Sources in 2008 NEI emitting 1 ton or more	7500	9,448,382	100%
SO ₂ sources > 100 tons	1684	9,374,962	99%
SO ₂ sources > 250 tons	1268	9,307,657	98%
SO ₂ sources > 1000 tons	779	9,042,377	96%
SO ₂ sources > 2000 tons	585	8,767,914	93%
SO ₂ sources > 2880 tons	479	8,508,328	90%
SO ₂ sources > 5000 tons	352	8,029,246	85%

[Source: <http://www.epa.gov/ttn/chief/net/2008inventory.html>]

SO₂ Ambient Monitoring Network

Current number of monitors nationally: 441

Number of monitors in 1980: 1500³

Current minimum monitoring requirements: 129 monitors required in 104 CBSAs⁴

For sake of comparison, the following table provides the current number of ambient monitors nationally for each criteria pollutant:

Pollutant	Number of Monitored Sites (as of end of 2011) ⁵
Carbon Monoxide	330
Lead	198 (for TSP in local conditions)
Nitrogen Dioxide	397
Ozone	1291
PM2.5	868
PM10	684
SO ₂	441

SO₂ Ambient Monitoring Data

Based on ambient monitoring data from 2008-2010, there were about 70 monitors located in 60 areas with 1-hour SO₂ concentrations exceeding the level of the standard.

³ Source: http://www.epa.gov/ttn/ecas/regdata/RIAs/pSO2_ch2_11-16-09.pdf

⁴ Based on 2010 census data and 2008 NEI data.

⁵ Based on AirData files pulled from AQS in February 2012. Please note these are sites, and not necessarily individual monitors.