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# Recommendations to the Clean Air Act Advisory Committee

Air Quality Management Work Group  
Phase I and Next Steps | January 2005



## **Acknowledgements**

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## **Executive Summary**



## Executive Summary

In June 2004, the Clean Air Act Advisory Committee (CAAAC) formed the Air Quality Management Work Group. The Work Group's task was to assess the recommendations made by the National Research Council (NRC) of the National Academies in its 2004 report, *Air Quality Management in the United States*,<sup>1</sup> and to advise the CAAAC on ways to improve the U.S. air quality management system, with an emphasis on activities that could be accomplished in the next one to five years. The NRC report described the dramatic improvements in air quality achieved in the U.S. since 1970, and the resulting improvements in human health and the environment. Despite these improvements, however, the NRC found that air quality challenges remain in many areas of the country, especially in heavily populated areas, with significant implications for public health. It noted a number of areas in which the air quality management system could be enhanced to allow progress to continue in a more effective and efficient manner. Recognizing this, the CAAAC charged the Work Group with outlining concrete steps that could promote change in the directions recommended by the NRC.

The Work Group formed two subgroups, the Science and Technology Subgroup and the Policy and Planning Subgroup, to focus on the critical issues outlined in the NRC report. From June through December 2004, the Work Group considered many options for change. The Work Group included representatives from State and Local organizations, Tribal interests, regional organizations, environmental and public health organizations, industry, and the United States Environmental Protection Agency (EPA).

In this report, the Work Group advances detailed recommendations. These recommendations address the five main areas of concern of the NRC:

- 1) Strengthening scientific and technical capacity.
- 2) Expanding national and multistate control strategies.
- 3) Transforming the SIP process.
- 4) Developing an integrated program for criteria and hazardous air pollutants.
- 5) Enhancing protection of ecosystems and public welfare.

The overall objective of this Work Group is for these recommendations to be implemented by EPA, States and others in order to make further improvements in air quality, which will result in improved human health and ecosystem protection. The recommendations presented in this report are designed to be implemented in the near term. Some of them require short-term process changes or alterations to existing policies that can be accomplished relatively quickly and will result in substantial improvements in efficiency and effectiveness of current programs. These recommendations will streamline processes, improve resource allocation, and enhance scientific and technical capacity. Other recommendations suggest initial steps that should be taken to form the basis for longer-term initiatives to be carried forward into the future. These recommendations focus on larger-scale efforts that would transform the air quality management system in more fundamental ways and further strengthen its scientific and technical underpinnings. These latter efforts would, of course, require more resources and time to implement fully. However, the Work Group regards them as critical steps that must be taken soon so that long-term gains can be realized.

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<sup>1</sup> <http://www.nap.edu/books/0309089328/html>.

Over the past six months, the Work Group also considered a variety of other issues on which it is not prepared to make recommendations at this time. Some topics were so complex, resource intensive, or controversial that the Work Group was unable to reach consensus and, therefore, has decided not to try to resolve them at present. Additional discussion on these topics is expected in the future. The Work Group has also begun considering options for the air quality management system in the future. It evaluated the long-term challenges facing air quality management in the U.S. from a number of perspectives and identified several criteria that may help guide discussions on alternatives for reforming the current system in future years. To help begin this process, the Work Group outlines four approaches reflecting different views that could serve as the basis for a more complete transformation of the air quality management system. In addition, the Work Group recommends that discussion of future options and unresolved issues be continued over the next several months.

The Work Group advises that the recommendations contained in this report be implemented by EPA, State, local, and Tribal environmental organizations, and other stakeholders in the immediate future. Several of the recommendations are critical because of impending implementation plans for ozone, PM<sub>2.5</sub> and regional haze. The Work Group, however, is sensitive to the level of resources needed to implement these recommendations and understands that EPA should establish priorities that reflect practical constraints. All of these recommendations can be implemented under the current authority of the Clean Air Act (CAA).

Specifically, the Work Group recommends:

- A new CAAAC subcommittee should be established to continue the assessment and development of recommendations for long-term changes to the air quality management system and to address the issues on which the Work Group could not reach consensus. Until the subcommittee is formed, the current AQM Work Group should continue working to further define and resolve additional issues and long-term framework options.
- The Work Group recommends that EPA carefully consider the recommendations and issue a response to CAAAC outlining a plan for implementation, and that EPA report back to the CAAAC subcommittee periodically on its implementation efforts.
- The new subcommittee, in conjunction with existing CAAAC subcommittees, should be assigned the responsibility for overseeing the implementation of, and any modifications to, the recommendations contained in this report.
- Following its establishment, the new subcommittee should develop a timeline for delivery of new recommendations and provide periodic progress reports to CAAAC. Discussion by the subcommittee on remaining issues and options should be directed towards further strengthening the U.S. air quality management framework over the next decade.

Air Quality Management Work Group  
**Report to the Clean Air Act Advisory Committee**



## **Introduction**



## Introduction

In 2004, the National Research Council (NRC) of the National Academies released a report entitled *Air Quality Management in the United States*. In this report, the NRC outlined the many substantial achievements of the United States air quality management (AQM) system over the past 30 years. Controls on air pollution enacted under the Clean Air Act have led to dramatic declines in emissions and air quality concentrations of a number of pollutants (Figure 1). The NRC concluded that these controls have been highly cost effective and have promoted the advancement of new technologies for pollution control.

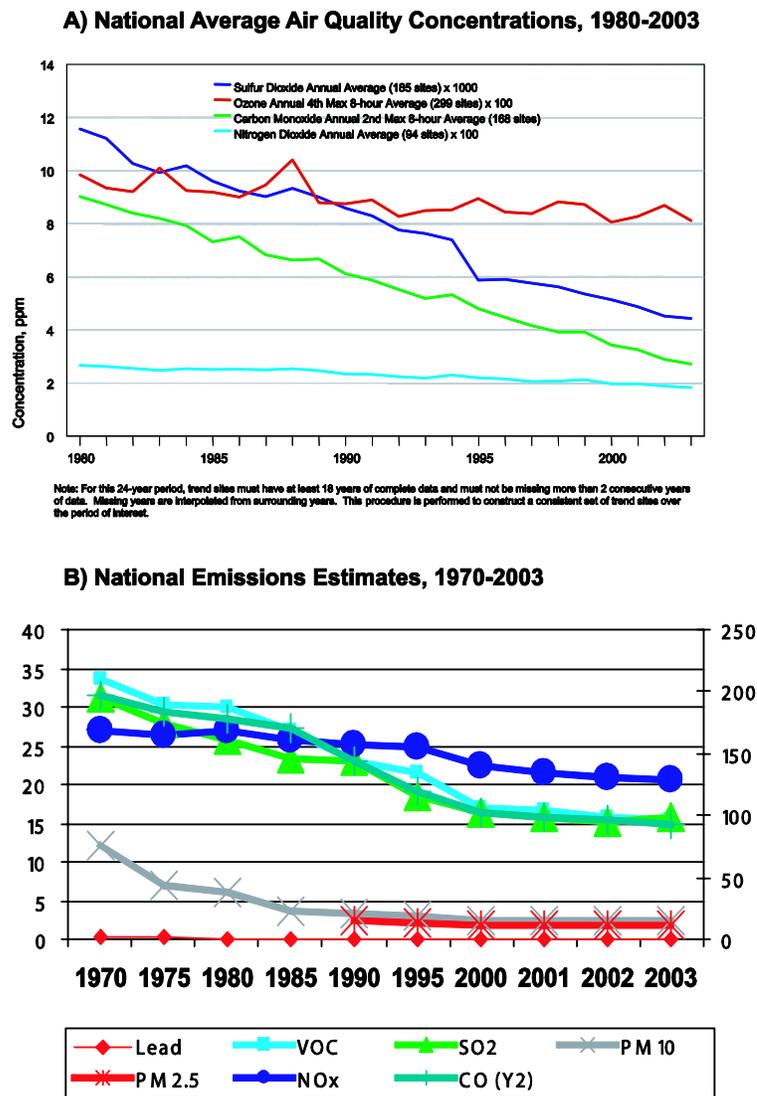


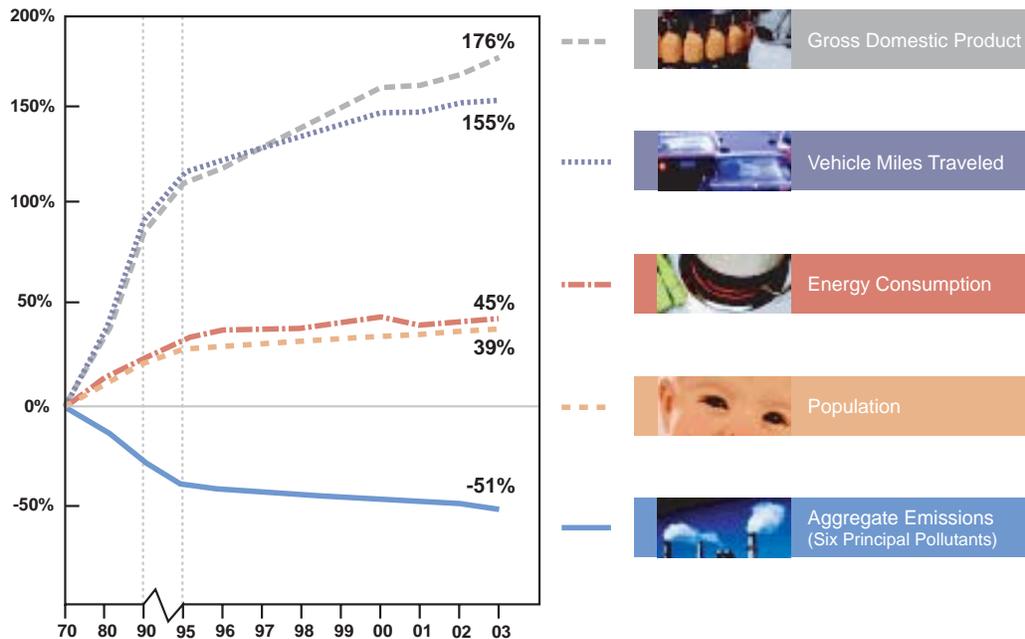
Figure 1. National Air Quality and Emissions Trends for selected ‘Criteria’ Pollutants.<sup>2</sup>

A) Long-term air quality trends and, B) national emissions trends illustrate the continuing improvement achieved by air quality management under the Clean Air Act.

<sup>2</sup> U.S. EPA Air Quality System (<http://www.epa.gov/ttn/airs/airsaqs>).

Overall, the nation has achieved a 51 percent decrease in aggregate emissions of the six principal air pollutants and their precursors since 1970, despite significant increases in population, energy consumption, gross domestic product, and vehicle miles traveled (Figure 2). These successes demonstrate that implementation of the Clean Air Act has resulted in significant progress toward improving the nation’s air quality and protecting the health of its citizens.

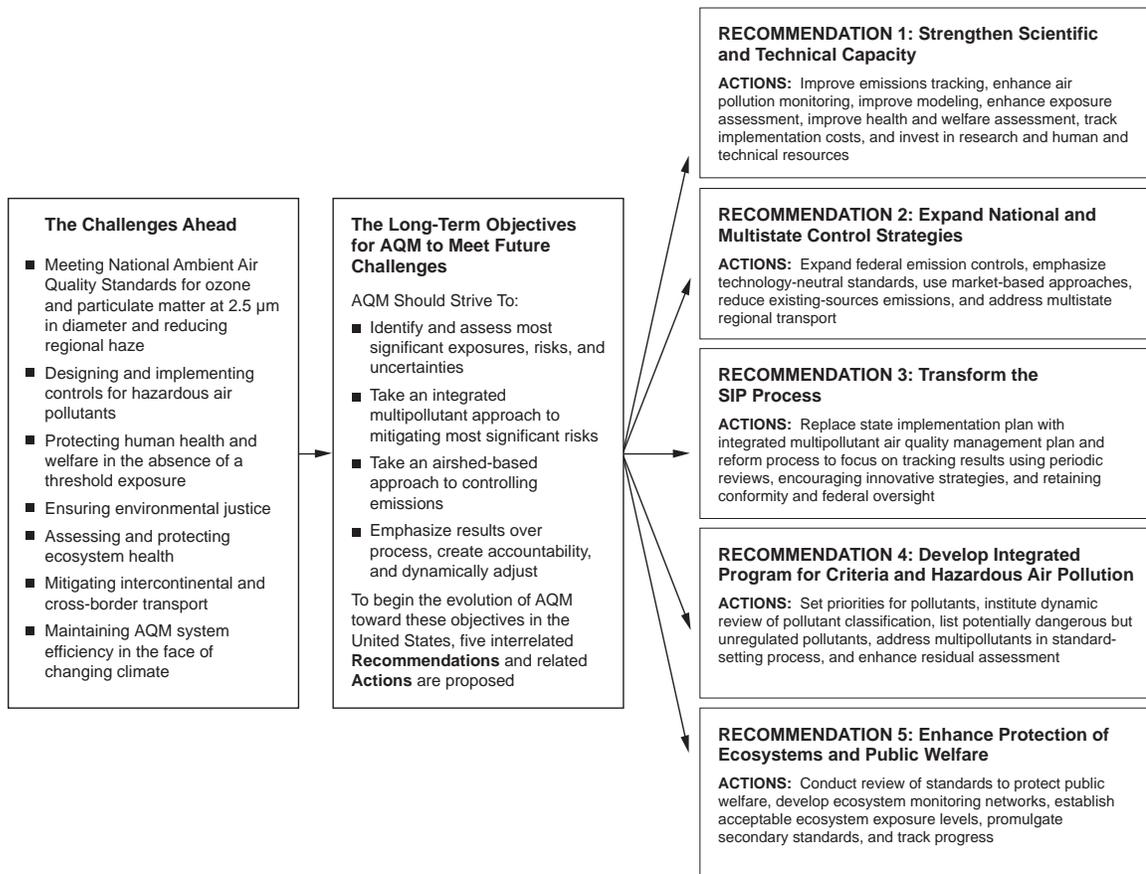
### Comparison of Growth Areas and Emissions



**Figure 2. Comparison of Growth Areas and Emissions.**<sup>3</sup> Between 1970 and 2003, gross domestic product increased 176 percent, vehicle miles traveled increased 155 percent, energy consumption increased 45 percent, and U.S. population grew by 39 percent. During the same time period, total emissions of the six principal air pollutants dropped by 51 percent.

Looking to how such successes can be sustained or expanded in the future, the NRC identified areas where modifications to the AQM system could provide further benefits to human health and the environment in the most effective and efficient manner (see Figure 3). Some of the NRC’s recommendations involve near-term changes with immediate impact. Other NRC recommendations focus on more sweeping changes to the nation’s approach to air quality management over the mid- to long-term. Taken together, these recommendations provide the NRC’s vision of how AQM in the United States could be reshaped and improved to achieve greater benefits more rapidly and at lower cost.

<sup>3</sup> <http://www.epa.gov/air/airtrends/aqtrnd03/images/growth-and-emissions.gif>.



**Figure 3. NRC Vision for an Enhanced AQM System.**<sup>4</sup> To meet the major challenges that air quality management efforts will face in the future, the NRC identified a set of overarching long-term objectives.

## The Air Quality Management Work Group

Following the recommendation of the NRC to establish a stakeholder group to oversee implementation of its recommendations,<sup>5</sup> the Clean Air Act Advisory Committee (CAAAC), a body chartered under the Federal Advisory Committee Act, formed an Air Quality Management Work Group (hereafter “Work Group”). This group was charged with evaluating the NRC’s recommendations and advising the CAAAC on ways to improve the AQM system in the near-term. The Work Group included representatives from State and local organizations, Tribal interests, regional organizations, environmental and public health organizations, industry, and the Environmental Protection Agency (EPA). For a list of the Work Group members, see Appendix A of this report.

From June through December 2004, the Work Group considered many options to improve the U.S. air quality management system consistent with the NRC report. To organize its discussion, the Work Group formed two subgroups: one to address scientific and technological issues, and the other to address policy and planning issues. The Science and Technology Subgroup worked in

<sup>4</sup> National Research Council, *Air Quality Management in the United States*, (Washington, D.C.; National Academies Press, 2004), p. 10.

<sup>5</sup> NRC Report, p. 314.

a cross-disciplinary mode on most issues, but formed separate work teams that focused on health and exposure, and ecosystem issues. The Policy and Planning Subgroup also subdivided into teams that focused on: 1) improving the State Implementation Plan (SIP) process; 2) expanding the use of regional and national strategies; and 3) encouraging innovation and developing multipollutant approaches. A fourth team began to discuss longer-term visions of air quality management. Members from both the Science and Technology Subgroup and the Policy and Planning Subgroup, as well as outside academics, focused on developing more robust approaches for health and ecosystem issues. For an organizational chart showing the subgroups and work teams, see Appendix A.

All of these subgroups and teams met, separately and together, on numerous occasions to develop a set of detailed recommendations responding to the NRC report. The teams took as their starting point the four long-term objectives set forth in the NRC report (see Figure 3), and the five overarching recommendations the NRC suggested as steps toward achieving those objectives. Some of the recommendations outlined by the NRC that would require statutory change are not feasible in the near-term and are not addressed in this report. The NRC clearly recognized that the more significant changes embedded in its broad vision will take time to develop, and that some more immediate actions are warranted to assist States as they develop new ozone (8-hour), fine particle (PM<sub>2.5</sub>), and regional haze SIPs in the next few years. As the NRC wrote after outlining its four long-term objectives,

“Immediate attainment of these objectives is unrealistic. It would require a level of scientific understanding that has yet to be developed, a commitment of resources that would be difficult to obtain in the short term, and a rapid transformation of the AQM system that is undesirable in light of the system’s past successes. The committee proposes, therefore, that the AQM system be enhanced so that it steadily evolves toward meeting these objectives.”<sup>6</sup>

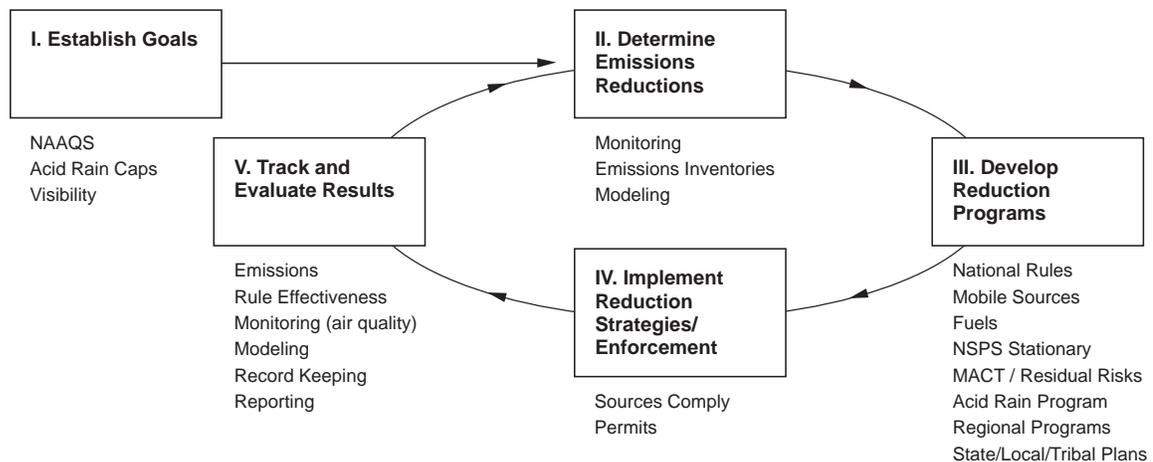
In the pages that follow, the Work Group provides a series of recommendations intended to begin this steady evolution. If implemented, these recommendations would build upon and strengthen the current system, starting with important modifications in the methods and technologies used to collect scientific data, as well as the ways those data are translated into control decisions. Though some of the recommendations will require further development to become wholly effective, they provide a necessary foundation for improving air quality programs. The Work Group agrees with the NRC findings that both short- and long-term changes are needed. The Work Group is, however, acutely aware of what is achievable within the next five years, and has, therefore, focused on short-term, pressing concerns such as providing support for the development of the upcoming SIPs. These actions include enhancing emissions inventories, redefining the role of air quality modeling, assisting in the development of multipollutant planning and control strategies, achieving reductions from mobile sources, and supporting innovative approaches to air quality improvement.

As the Work Group developed recommendations, the need for three categories of recommendations quickly became evident: 1) recommendations upon which there was substantial consensus among Work Group members; 2) recommendations upon which there was not consensus, but on which consensus might be reached with additional discussion by the Work Group or a follow-on group; and 3) recommendations that relate to an overarching long-term vision. This report presents the Work Group’s recommendations in each of these categories.

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<sup>6</sup> NRC Report, p. 16.

As a way of illustrating graphically how the system currently operates to manage and improve air quality and the performance of control programs, Figure 4 depicts the connections among the major components of the air quality management system. In this report, the Work Group first lays out a series of detailed recommendations that will improve how different components in the system are managed and enhance the feedback loops between the components. In these 38 recommendations, the Work Group offers concrete suggestions on how to improve the scientific and technical foundation of the AQM process, and how to enhance the policy and planning activities built on the scientific and technical foundation.



**Figure 4. Conceptual Diagram of the Air Quality Management Process.** Air quality management should be an iterative process of continuous improvement: (I) National goals are established by Congress or EPA. (II) Scientific and technical information are key to determining what pollutants need to be reduced, by how much, and over what scale and time. (III) Strategies are then developed to achieve needed pollution reductions. Over time, the CAA Amendments have added emphasis on national controls for mobile sources and some stationary sources. The States (SIP process) are responsible for developing additional reduction programs as needed. (IV) SIPs are then adopted and enforced as sources implement reduction measures. (V) Finally, air quality and emissions are tracked to determine how well the measures worked to improve air quality. Depending on the outcome, the process may require further iterations.

The Work Group recognizes that among the many suggestions for change outlined, virtually all require an expenditure of resources by EPA, States/Locals/Tribes (S/L/T), or other organizations, and, in some cases, may require large resource commitments over many years. Thus, either new resources need to be identified for implementation of the recommendations in this report, or a discussion needs to occur about reallocation of existing resources at the State and Federal level. The Work Group is very sensitive to these resource considerations and understands that priorities must be established which reflect the practical constraints. The Work Group lacked the time and information to complete prioritization during the first phase of its discussion, but would like to work with the CAAAC and EPA to assist them in setting priorities over the next few months. Key considerations should include, but are not limited to: whether the change is needed to assist the development of ozone, PM<sub>2.5</sub> and regional haze SIPs; whether the action is one not currently underway, but could greatly improve the current process if implemented by a certain time; and whether the recommendation relates to critically needed improvements that will take multiple years to accomplish and, therefore, needs to be initiated soon.

After presenting the recommendations on which the Work Group was able to reach substantial consensus, the report highlights a number of other crucial issues that the Work Group has discussed. Though the Work Group has not yet been able to reach consensus on these issues, it has engaged in considerable debate and is now prepared to summarize that debate and outline a suggested process for further discussion in the future.

For areas requiring longer-term or more fundamental changes, the Work Group has focused on outlining possibilities and initial steps which could steer the AQM system in the desired direction. The final section of this report lays out important criteria to consider when designing new air quality management programs in the future, and outlines briefly four options for a revised AQM framework that the Work Group considered, but upon which it has not reached final conclusions. The Work Group recognizes, however, that even these four options do not address the universe of potential changes, either minor or substantial, that could be considered in a comprehensive look at the current AQM system.

## Next Steps

The Work Group recommends that decisions on implementation of the recommendations in this report, as well as discussion of future options and unresolved issues, be continued over the next several months. These continuing discussions would also allow review and/or adjustment of the near-term recommendations if warranted. Specifically, the Work Group recommends:

- A new subcommittee of CAAAC should be established to continue the assessment and development of recommendations for long-term changes to the air quality management system and the issues on which the Work Group could not reach consensus. Until this subcommittee is formed, the current Work Group should continue working to resolve additional issues and discuss long-term framework options. Following its establishment under the CAAAC, the subcommittee should develop a timeline for preparing additional recommendations and provide periodic progress reports to CAAAC. Discussion of all remaining issues and options should be directed towards further strengthening the U.S. air quality management framework over the next decade. The Work Group recommends that the new subcommittee, in conjunction with existing subcommittees, also be given the responsibility for overseeing the implementation of, and any modifications to, the recommendations contained in this report.
- EPA should carefully consider the recommendations presented in this report, and should issue a response to the CAAAC as soon as practical outlining a plan for implementing those recommendations to the extent possible. The CAAAC should support EPA's development of this plan. EPA should report back to the newly formed CAAAC subcommittee periodically on its implementation efforts.

# **Air Quality Management Work Group Recommendations**



## Air Quality Management Work Group Recommendations

In the next five sections of the report, the Work Group lays out 38 recommendations on which it achieved substantial consensus (see Recommendations Matrix: Appendix B). These detailed recommendations are organized according to the five overarching recommendations of the NRC (see Figure 3, above). At the top of each section, a header identifies the relevant NRC recommendation. The recommendations outlined in these five sections are also detailed in background papers found in Appendix B, with more complete information about background, supporting evidence, feasibility considerations, and preliminary resource estimates. For many of the recommendations, the Work Group has defined an appropriate time frame for implementation, with most starting as soon as possible. This set of recommendations, if implemented, will strengthen the current AQM system by streamlining processes, improving the quality of data, and enhancing the efficiency and effectiveness of current control efforts.

### NRC 1: Strengthen Scientific and Technical Capacity

The NRC noted that a key to improving air quality management in the United States is improving our knowledge concerning the sources and emissions of air pollutants and their precursors, the mechanisms of their fate and transport, and their impacts on human health and the environment. Achieving these goals will require significant efforts on many fronts. First, the Work Group recommends significant improvements in the collection, management, and analysis of emissions and ambient air quality data. This step is critical for moving the nation's AQM system toward a more performance-oriented approach, and for supporting a framework to track significant health- and ecosystem-based outcomes. On the scientific and technical front, the Work Group makes the five recommendations below.

The first two recommendations focus on improving the information we currently have about *emissions* of air pollutants. Recent studies have noted many deficiencies in current emissions inventories (e.g., NARSTO 2004), such as poorly defined emissions factors and inefficient emissions reporting. Improved emissions inventories are needed to provide for more effective planning for control strategies and to meet future air quality challenges. Therefore, the Work Group recommends:

**1.1 Emissions Measurements and Reporting** - *EPA, in conjunction with States/Local/Tribes (S/L/T) and affected stakeholders, should pursue improved emissions measurements and reporting to enhance emissions databases for more accurate air quality assessments and tracking of progress.* A strong national effort is needed to require emissions measurements and reporting for as many major source categories as possible. The primary objective of this recommendation is to produce accurate emissions data for supporting control strategy planning and tracking progress (and establishing accountability mechanisms because they reduce uncertainty in emissions inventories), enhancing opportunities to establish viable emissions trading programs, supporting air quality modeling, and increasing certainty for compliance purposes. In 2005 and 2006, EPA, in conjunction with S/L/T and affected stakeholders, should:

- Conduct a study to identify relevant existing emissions measurement methodologies, categories for which these methodologies are necessary and appropriate, and protocols for conducting these measurements.

- Identify efforts needed to develop new emissions measurement methodologies and technologies for other source categories (e.g., continuous emissions monitors (CEMs),<sup>7</sup> “random” stack testing for minor sources and remote sensing).
- Evaluate the need for and appropriateness of regulations to require emissions measurements. As necessary and appropriate, EPA should undertake rulemaking to establish these requirements as soon as possible.
- Evaluate the need for and appropriateness of regulations to require reporting of emissions measurements to a user-friendly central database, similar to EPA’s Acid Rain database for Electric Generating Units (EGUs). As necessary and appropriate, EPA should establish these requirements through rulemaking as soon as possible.



**Figure 5. Continuous Emissions Monitor.**

These instruments provide high quality information on air emissions and exhaust gas characteristics. See Recommendation 1.1.

Photo credit: Inquest Environmental, Inc.

**1.2 Emissions Factors and Estimation Methods** - *Where emissions measurement-based information is impractical to obtain for air quality assessments, or where improved projections are needed, EPA, in conjunction with S/L/T and affected stakeholders, should improve emissions factors and emission estimation methods.* A strong national effort is needed to improve emission estimation methods for major source categories, especially for sources that are poorly characterized or whose emissions estimates are uncertain. The primary objective of this recommendation is to produce better emissions inventories for supporting air quality modeling and tracking progress. In 2005 and 2006, EPA, in conjunction with S/L/T and affected stakeholders, should:

- Review existing emissions factors to identify the most significant needs, recommend and prioritize data collection and steps necessary for improving emissions factors, and develop and implement procedures for quickly disseminating new emissions factors.
- Review existing source profiles used in source-based (and receptor-based) modeling to identify the most significant source profile needs, and recommend and prioritize data

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<sup>7</sup> CEMs are already required by Title IV of the Clean Air Act for certain Electric Generating Units, by the Ozone Transport Commission’s (OTC) NOx Trading Program for several source categories, including industrial boilers, turbines, and cement kilns, or by numerous NESHAPS or NSPS.

collection and steps necessary for improving or developing source profiles for poorly characterized sources.

- Conduct a study to reconcile current emissions inventories with ambient measurements. Based on the study, EPA should work with the S/L/T and affected stakeholders to improve emissions estimates.

Recommendation 1.3 seeks to improve the usefulness and acceptance of technical information for air quality planning and decisionmaking. The Work Group recommends:

**1.3 Uncertainty in Emissions Inventories and Modeling** - *EPA, in conjunction with S/L/T and affected stakeholders, should quantify and take actions to reduce uncertainty in emissions inventories and air quality modeling applications, provide guidance for incorporating uncertainty assessments into SIP planning, and improve communication of uncertainty to decision-makers.* Technical analyses performed to support policy development address complex and sometimes poorly understood problems. While serious attempts are made to rely on the best science available at the time, there are limitations to these analyses. In 2005 and 2006, EPA, in conjunction with S/L/T and affected stakeholders, should conduct the following actions to better characterize, quantify, and reduce uncertainty in existing emissions inventories and modeling analyses:

- Conduct a study to evaluate sources of uncertainty in emissions inventories and modeling analyses for all sources; identify needed data collection activities (and associated costs) to reduce the most significant emissions uncertainties; and identify appropriate methods for incorporating uncertainty in preparing emissions inventories and conducting modeling analyses. Uncertainty also is present in monitoring data, but it can be better characterized.
- Provide guidance to S/L/T for incorporating uncertainty assessments in SIP and Tribal Implementation Plan (TIP) planning.

Recommendation 1.4 seeks to provide more scientifically relevant and responsive data for air quality planning and tracking progress, and to provide a more robust and spatially complete basis for current and future air quality planning. Specifically, the AQM Work Group recommends:

**1.4 Multipollutant Monitoring** - *EPA, in conjunction with S/L/T and affected stakeholders, should promote and improve integrated, multipollutant monitoring.* Over the past 30 years, the air pollution situation has changed significantly as control programs have reduced emissions of many pollutants and as science has identified emerging issues of concern. Accordingly, it is important that air monitoring efforts be more dynamic and responsive to meet the current and future public, regulatory, and scientific needs. To promote and improve monitoring over the next 3 to 4 years, EPA, in conjunction with S/L/T and affected stakeholders, should:

- Finalize its proposed national ambient monitoring strategy, and S/L/T should, as appropriate, work together on a regional scale to consider the need for, and, if appropriate develop, regional monitoring strategies.
- Establish a minimum of six Level I (research-grade) NCore sites with reasonable geographic coverage (e.g., one each in the Northeast, Southeast, Midwest, and South, and two in the West), and in conjunction with S/L/T, establish the Level II (multipollutant) NCore sites (see Figure 6).
- Support research and development to improve monitoring methods for several pollutants, including PM<sub>2.5</sub>, PM-coarse, and air toxics.

- Promote policies to avoid disincentives for monitoring.
- Promote co-location of atmospheric dry and wet deposition monitoring with long-term monitoring of ecological conditions whenever possible.



**Figure 6. Enhanced Multipollutant Monitoring Site.** Ambient monitoring site operated by the Wisconsin Department of Natural Resources in Mayville, Wisconsin, which includes the multipollutant measurements associated with Level II NCore sites.

At the core of the NRC recommendations for transforming the Air Quality Management system in the U.S., was a call to create *accountability* for the results, and dynamically adjust and correct the system in response to data from programs that track progress. The Work Group recognizes that substantial information and tools already exist for expanding the role of tracking in the SIP process and has made some recommendations for beginning to expand the role of tracking and evaluation in the process (see Recommendations 3.14 and 3.15). Nevertheless, the kind of comprehensive approach envisioned by the NRC will take a concerted effort that includes assessing the available scientific information (e.g., identifying and expanding new research and assessments programs). To promote understanding and characterization of the impacts of air quality changes on health and ecosystem outcomes, and to improve the scientific basis for more informed policy decisions, including the need for and nature of air quality standards, the Work Group recommends:

**1.5 Framework for Accountability** - *EPA, in conjunction with atmospheric scientists, health and ecosystem experts, S/L/T, and affected stakeholders, should undertake a systematic effort to track air quality achievements and evaluate air program results. This effort should begin by focusing on the progression and associations of air emissions as they interact and ultimately affect human health and the environment. In order to move beyond the current approach of relying predominantly on air quality measurements, we need to further develop and apply the capacity to monitor, assess, and report on how changes in emissions impact air quality, atmospheric deposition, exposure, and effects on human health and ecosystems. Emphasis should be placed on developing and enhancing appropriate health and ecosystem indicators, benchmarks, and subsequent analyses within this overarching accountability framework.* To establish greater accountability for protecting human health and the environment, EPA should better track, assess, and communicate significant results of emissions control programs, including changes in sources and emissions, air quality and atmospheric deposition, exposures, and effects. Emphasis should be placed on systematically measuring progress and assessing benefits of air quality management through enhancing and expanding the suite of benchmarks and indicators of health and ecological outcomes. The Work Group recommends a 3-part approach involving health effects, ecosystem effects, and SIP planning

for systematically ensuring that air policies and programs are achieving intended results. Over the next two years, the Work Group recommends:

- EPA should work with health effects experts (e.g., federal agencies under the Committee on the Environment and Natural Resources (CENR) Air Quality Research Subcommittee; the Clean Air Scientific Advisory Committee, the State/EPA/Center for Disease Control/EPA environmental public health tracking partners, and the Health Effects Institute) to develop measures to define and assess human health impacts of air pollution and ways to track and evaluate progress in reducing those impacts. Specific actions include:
  - Facilitating communications among health research and program accountability efforts;
  - Expanding on-going efforts into public health and air quality accountability; and
  - Undertaking specific accountability efforts.
- EPA should work with others to develop benchmarks and measures to assess ecological impacts of air pollution and improve ways to track and evaluate progress in reducing those impacts. Specific actions include:
  - Improving tracking and assessing the effects of multiple air pollutants on ecosystems;
  - Conducting and facilitating integrated assessments and research to develop and implement an appropriate suite of measurements for detecting ecosystem response;
  - Facilitating and pursuing collaboration on integrated assessments; and
  - Examining the possibility of using critical loads and thresholds.
- EPA should work with S/L/T to determine appropriate metrics which should be used to more effectively track progress.

## **NRC 2: Expand National and Multistate Control Strategies**

As the NRC has indicated, national and multistate approaches to pollution control have been particularly effective in reducing emissions and should be implemented more widely. In addition, national or regional approaches incorporating cap-and-trade provisions can be efficient mechanisms for reducing regional air emissions. While recent initiatives such as the NO<sub>x</sub> SIP Call, the proposed Clean Air Interstate Rule (CAIR), the Heavy-Duty Diesel Rule and the Non-Road Rule are expected to expand the use of regional and national strategies, the Work Group has identified a number of significant stationary and mobile source categories with substantial emissions which should be evaluated for potential controls.

States face an ambitious schedule for attaining the PM<sub>2.5</sub> and 8-hour ozone standards (in 2010 for PM<sub>2.5</sub> and beginning in 2007 for ozone), and for meeting regional haze requirements. The NRC report clearly states that regional and national controls are an integral part of any national strategy for cost-effective attainment of these standards.

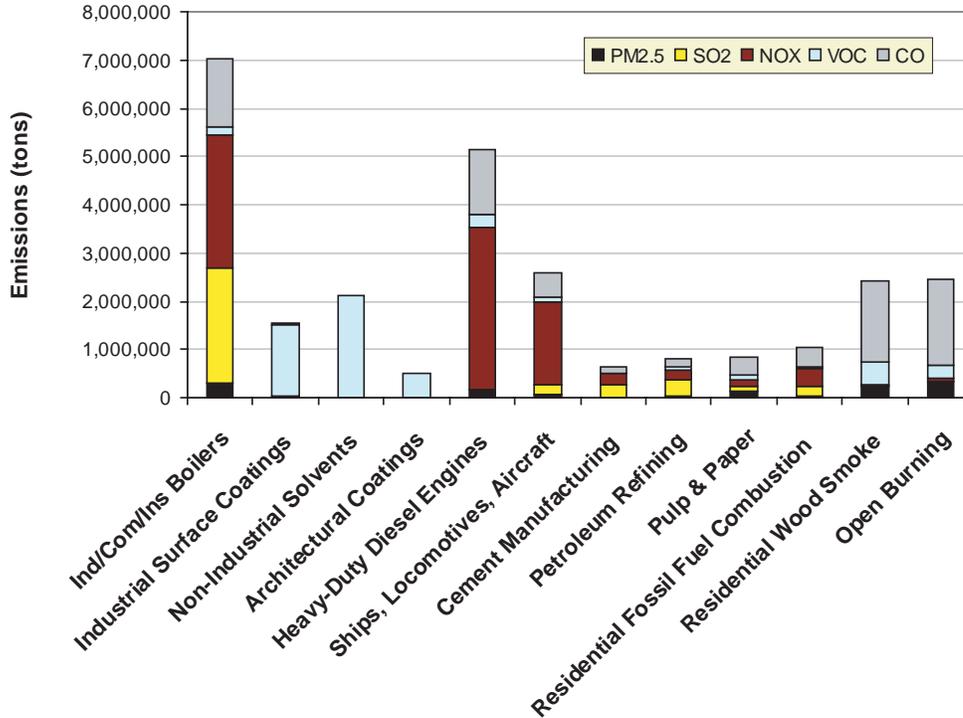
The NRC also recognized, however, that continued nonattainment for ozone and PM<sub>2.5</sub> as projected for 2010 (assuming implementation of currently planned emissions control measures), will require a multipronged approach that includes innovative, federally supported local measures as well as regional or national controls. The Work Group agrees that an approach combining a

variety of different measures will be most effective in reducing air pollution nationwide and solving the worst problems in nonattainment areas. Furthermore, a combination of local, regional, and national approaches targeting particular sectors is likely to be the most effective in addressing pollutants in a comprehensive and integrated fashion (see NRC Recommendation 4 on multiple pollutants). Therefore, strong and timely regional and national approaches are needed to complement State and local controls to help the nation achieve rapid improvements in air quality.

To help direct choices of control strategies in the next few years, the Work Group considered future year (2010) regional and local (nonattainment area) emissions inventories, select source apportionment studies, and modeling analyses. The future year regional emissions inventories were used initially to screen a list of more than 40 categories of mobile, stationary, and area sources, and to identify those with the more significant criteria pollutant emissions. The other information (i.e., nonattainment area emissions inventories, source apportionment studies, and modeling analyses) was then used to help determine whether these source categories are better addressed at the national/regional level or the local level.

As a result of its deliberations over the past six months, the Work Group advances several specific recommendations about particular sectors or strategies. Some of these recommendations suggest regulations at the regional and/or national level as appropriate, while others concern national guidance for potential application at the local level. Some of the recommendations apply to mobile sources, while others focus on stationary or area sources.

Air emissions from the recommended categories are projected to continue to be substantial (see Figure 7). However, a variety of factors must be considered in determining whether and how a sector can be effectively regulated, including pollutant type, geographic location, dispersion patterns, multipollutant interactions, control strategy availability, emissions reduction potential, and cost-effectiveness. Some Work Group participants believe that adequate information exists to begin the regulatory process now for certain source categories, while others believe that additional data and data analyses are necessary. After extensive deliberations, the Work Group recommends that each of the sectors listed below be addressed in some fashion by EPA. This action may include, but should not be limited to, development of national and/or regional rules, control technique guidelines, other guidance, and/or further study.



**Figure 7. Projected 2010 National Emissions for Key Source Categories.** In developing recommendations relating to the source categories shown here, Work Group analysts examined projected emissions of five key criteria pollutants to 2010 for 40 stationary and mobile categories. Excluding electricity generating units (EGUs) and natural emission sources, the categories shown comprise over 70 percent of the national SO<sub>x</sub> and NO<sub>x</sub> emissions and about 30% of the direct PM<sub>2.5</sub> and VOC emissions. These projections include recognized uncertainties in the current inventory and the forecast. Due to data limitations, the assessment did not include estimates of air toxics emissions or ammonia.

In each case, EPA should review the contributions from these categories, assess the technical and economic feasibility of further controls, and conclude this review process as soon as possible, given the urgency of achieving effective air quality improvements. EPA should initiate appropriate actions regarding the category consistent with the results of its analysis as soon as possible. Because cost-effectiveness and technical feasibility are important considerations, EPA should also consider whether market mechanisms or program design elements, such as cap-and-trade provisions, can be employed to improve environmental results while maximizing flexibility and efficiency.

### Sectors for Further Study and Possible National and Regional Regulations

The Work Group recommends that EPA consider developing national and/or regional rules for sectors identified as key contributors to nonattainment from a national or multistate perspective. The Work Group acknowledges the importance of working more directly with these industry sectors to further evaluate the emissions contributions from the respective categories.

#### *Stationary and Area Source Categories*

**2.1 Industrial, Commercial, and Institutional Boilers** - *EPA should complete as soon as possible a review of the contributions from this category and the technical and economic*

*feasibility of further controls, given the high priority assigned to this sector. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.*

**2.2 Industrial Surface Coatings** - *EPA should complete as soon as possible a review of the contributions from this category and the technical and economic feasibility of further controls. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.*

**2.3 Non-Industrial Solvents** - *EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., national rules) for this category using the volatile organic compound (VOC) content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.*

**2.4 Architectural Coatings** - *EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., national rules) for this category using the VOC content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.*

### *Mobile Source Categories*

In the mobile source area, the Work Group endorses the following recommendations made by the Mobile Source Technical Review Subcommittee of the CAAAC:

**2.5 Heavy-Duty Diesel Engines** - *EPA should reduce emissions from the existing fleet of heavy-duty diesel engines by employing a multi-pronged approach.* Over the last decade, EPA has moved aggressively to strengthen federal emissions standards for a wide range of diesel engines. While these standards will serve to dramatically lower emissions when fully implemented, the full human health benefits will not be realized for 20 years or more. The delay in achieving emissions reductions is attributable to two factors: the fact that emissions standards do not take effect for new engines until 2004-2007, and the long lifespan of the existing fleet of diesel engines. The Work Group recommends that EPA employ a variety of strategies to monitor and reduce emissions from the in-use fleet. This is a high priority for action within the next 3-4 years. Recommended actions include:

- Continue working with manufacturers to ensure heavy-duty compliance and supporting initiatives such as heavy-duty inspection and maintenance programs, harmonized nationwide on-board diagnostics requirements for heavy-duty vehicles, and development of portable emissions measurement capabilities for diesel PM.
- Encourage voluntary programs for diesel retrofits, idling reductions, and other emissions control strategies, concentrating on the construction, port, freight, and school bus sectors.

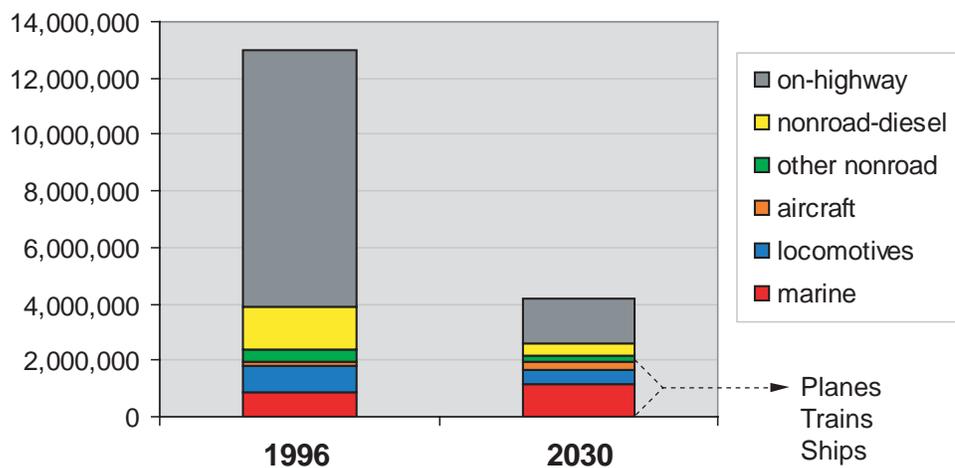
Some members of the Mobile Source Technical Review Subcommittee believe EPA should consider expanding current federal programs through a mandatory program of accelerated retirements, retrofits, repowering, replacement and anti-idling measures. These stakeholders believe EPA should encourage retrofits for all heavy-duty diesel engines by 2012 by: (a) establishing mandatory measures to cut pollution from existing diesel engines; and (b) seeking Congressional appropriations to expand funding for programs aimed at reducing emissions from heavy-duty engines.

## 2.6 Emissions from Ships, Locomotives, and Aircraft, and Mobile Source Air Toxics

- EPA should address emissions from ships, locomotives, and aircraft, and mobile source air toxics through national emissions standards. While emissions from most categories of mobile sources have stabilized or decreased over the past two decades, emissions from ships, aircraft, and locomotives have increased and are forecast to continue to increase (Figure 8). Nationally, these sectors produce substantial emissions of both criteria pollutants and air toxics, and they represent major sources of pollution at the local level. EPA should control criteria and toxic pollutant emissions from ships, aircraft and locomotives, and other mobile source air toxics by:

- Promulgating technology-forcing emissions standards for all new marine diesel engines, all new and rebuilt locomotive engines, and all aircraft engines.
- Developing national rules to control mobile source air toxics and criteria pollutants through fuel reformulation (e.g., national benzene cap, lower sulfur fuels).
- Developing strategies for reducing emissions at airports, seaports and rail yards that can be employed at the S/L/T level, such as reducing engine idling and taxiing, imposing differential landing fees, using gate-powered electricity, or reducing emissions from ground service equipment.

EPA has already begun action for some of the source categories outlined above. Current plans call for a Notice of Proposed Rulemaking (NPRM) on gasoline outboard, sterndrive, inboard and personal watercraft engines in the Spring of 2005; an NPRM on locomotive and marine diesel standards in mid-2005; an NPRM on air toxics in mid-2005; a final rule adopting the existing International Civil Aviation Organization NO<sub>x</sub> standards for aircraft engines in 2005; and a final rule on ocean-going marine diesel engines by mid-2007. EPA should give high priority to continuing the development of these standards and adopting additional control strategies, as necessary.



**Figure 8. Mobile Source NO<sub>x</sub> Emissions Projections.** Over the next 30 years, highway emissions are projected to decrease greatly, with the result that categories with limited controls – ships, locomotives, and aircraft – will become of increasing relative importance for air pollution control strategies. See Recommendation 2.6.

## **Evaluation of Additional Emissions Reduction Potential and Cost-Effectiveness**

For some sectors, the Work Group did not reach consensus on whether there are sufficient data to recommend that EPA consider national and/or regional strategies at this time. The Work Group determined that additional research and consultation was necessary to clarify the timing and levels of national or regional pollution-reduction measures that would be appropriate for the following potentially important sectors:

**2.7 Cement Manufacturing, Petroleum Refining, and Pulp and Paper** - *The cement manufacturing, petroleum refining, and pulp and paper industrial source categories are already under substantial regulation, but continue to be significant sources of pollutants and warrant further consideration by EPA. EPA should evaluate potential national or regional emissions reduction strategies for criteria pollutants and air toxics in these categories. This should include improving emissions inventories if necessary and assessing their impacts on nonattainment areas or other sensitive areas. EPA should carefully consider the cost-effectiveness of imposing additional controls as it determines whether additional emissions reductions are justified and should take action consistent with the results of this analysis.*

**2.8 Residential Fossil Fuel Combustion** - *EPA should evaluate the potential for expanding the Energy Star voluntary program to gain additional criteria pollutant emissions reductions (as well as improve energy efficiency) from the residential fossil fuel sector. As part of this effort, EPA should continue to gather information on the characteristics of residential fossil fuel emissions and their contributions to nonattainment, and the magnitude and cost of potential emissions reductions under a voluntary program and/or expanded use of low-sulfur fuel. EPA should also coordinate with Regional Planning Organizations (RPOs) and companies that produce lower-emitting appliances to assess the potential for programs that promote the installation of such technologies.*

## **National Guidance for Local Controls**

National rules are complex and take several years, at minimum, to develop for any industrial sector. Recognizing that many of the most severe air quality problems in the nation demand more immediate action to assist S/L/T in developing their Implementation Plans for ozone, PM<sub>2.5</sub>, and regional haze, the Work Group recommends that, in addition to developing national or regional rules for the sectors discussed above, EPA should issue guidance as soon as possible for use at the local level or offer additional federal support for existing local-level programs. Specifically:

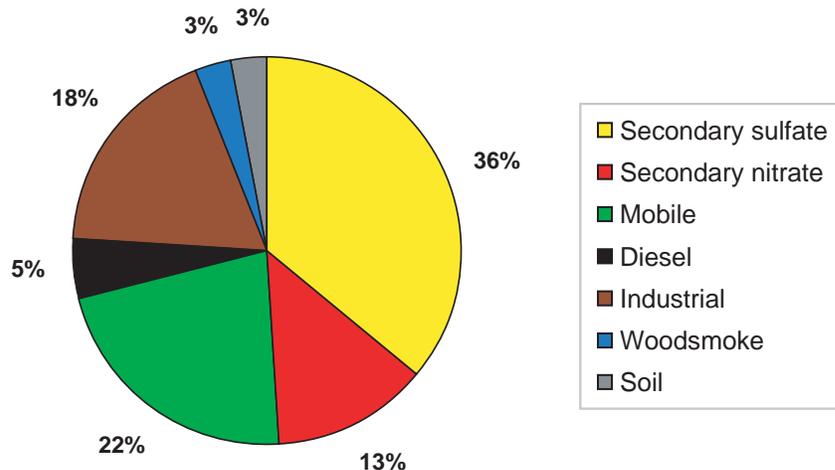
**2.9 Guidance for Local Control Measures in Key Sectors** - *EPA, in conjunction with S/L/T and affected stakeholders, should prepare federal guidance for local (urban-scale) control measures to support the upcoming round of ozone and PM<sub>2.5</sub> SIPs, and, if possible, optimize multipollutant control benefits and opportunities for reducing criteria and toxic air pollutants. Federal guidance is needed by October 2005 to assist States in preparing SIPs to address ozone and PM<sub>2.5</sub> nonattainment and regional haze milestones. Based on a preliminary review of available ambient monitoring data, source apportionment studies (see Figure 9), modeling analyses, and emissions inventories, the Work Group recommends that EPA, in conjunction with S/L/T and affected stakeholders, should issue guidance as soon as possible for the following source sectors:*

- Residential wood stoves and fireplaces;
- Open burning;

- Mobile sources (high-emitting vehicles and diesel retrofit programs); and
- Industrial operations (e.g. cement manufacturing, petroleum refineries, pulp and paper, metals, and surface coating).

In prioritizing development of the guidance, EPA should consider factors such as emissions reduction potential, timeliness, cost effectiveness, completeness of existing guidance, and reactivity. Additionally, EPA, in conjunction with S/L/T and affected stakeholders, should continue to assess other source categories that would benefit from local (urban-scale) strategies. The identification of these categories should be based on the same factors cited above (e.g. evaluation of ambient monitoring data, source apportionment studies, modeling analyses, and future year emissions inventories). As appropriate, EPA should issue technical guidance for other source categories.

At this time, the Work Group is advancing more detailed recommendations for three of the listed sectors. In keeping with the NRC’s recommendation to focus on areas with the highest risk, the Work Group recommends the highest priority be placed on implementing local controls for these sectors in areas that do not attain the ozone or PM<sub>2.5</sub> standards, or that have air quality close to the standards:



**Figure 9. Fine Particle Source Apportionment.** <sup>8</sup> Estimated source contributions (%) to annual average PM<sub>2.5</sub> concentrations in St. Louis, Missouri (2000-2003). Secondary ammonium sulfates and nitrates are formed from reactions of SO<sub>2</sub>, NO<sub>x</sub>, and NH<sub>3</sub> emissions from a variety of sources over large scales. The relative fraction of source contributions can vary significantly among different urban areas. The apportionment results also may vary with analysis methodology uncertainties and monitoring.

**2.10 Residential Wood Smoke** - EPA should further develop the Residential Wood Smoke Reduction Initiative that includes working with S/L/T, industry, non-governmental organizations and others to support and facilitate the changeout of dirty, inefficient, “conventional” (pre-New Source Performance Standard or NSPS) woodstoves with new, cleaner, and more efficient heating appliances (e.g., EPA certified woodstoves). Concurrent with the development and implementation of changeout programs, EPA should commence efforts to revise the NSPS. Residential wood smoke contains various types of toxic air pollutants (e.g., polycyclic organic matter) and contributes 420,000 tons of direct PM<sub>2.5</sub> emissions annually. Almost 80 percent of these emissions come from about 10 million

<sup>8</sup> Center for Air Resources Engineering and Science, *Analysis of Midwest PM-Related Measurements* (draft), Philip K. Hopke, Jong Hoon Lee, Clarkson University.

woodstoves currently in use, 80 to 90 percent of which are pre-NSPS stoves. Many Tribes are affected by wood smoke from dirty stoves causing serious health problems in Indian communities. The voluntary residential wood smoke reduction initiative EPA began in 2004 should be expanded, with substantial increases in grants to States and Tribes to retrofit or replace existing woodstoves. In parallel, on the national level, EPA should update the NSPS to ensure that all woodstoves reflect the kind of clean technology available today (see Figure 10). In addition, EPA should consider emission control opportunities for fireplaces and outdoor wood boilers. While many of the aspects associated with this entire effort are local in nature, some are national in scope and require a national effort.



Photo credit: Wood Heat Organization, Inc.

**Figure 10. Woodstoves.** The change out of a) an old, dirty, inefficient “conventional” woodstove with b) a new, cleaner burning EPA-certified woodstove could potentially reduce emissions by 60 to 80 percent.

**2.11 Open Burning** - *EPA should work with S/L/T to encourage more vigorous control of open burning, especially in, and adjacent to, counties with Class I areas and counties classified as nonattainment for fine particles or ozone.* Open burning releases substantial emissions of PM<sub>2.5</sub>, VOCs, carbon monoxide, and other pollutants of concern. Emissions from open burning, released near the ground and most often in relative proximity to inhabited areas, contribute to urban smog, regional haze, ozone, and elevated PM<sub>2.5</sub> readings, and cause periodic localized exposures in excess of acceptable risks. To encourage controls on open burning, EPA and S/L/T should work cooperatively to develop guidance, model rules, and communication strategies for deployment at the local level. In addition, EPA should develop methods for crediting open burning control strategies in SIPs/TIPs. Open burning is of critical interest to Tribes near or in urban areas, as well as rural areas. Agricultural concerns also need to be considered.

**2.12 High-Emitting Gasoline Vehicles** - *EPA and S/L/T should reduce emissions from high-emitting gasoline vehicles that are believed to contribute a high fraction of mobile source emissions.* Increasingly stringent regulation of new vehicle emissions has had a large positive

effect on overall fleet emissions reductions. As a result, an increasing portion of uncontrolled mobile source emissions are produced by a relatively small fraction of high-emitting vehicles (such as poorly maintained vehicles or older vehicles). Future emissions reductions in this sector depend on identifying and controlling such vehicles. In the next 3-4 years, EPA should:

- Determine the impact of high-emitters on today's mobile source inventory, using new data sources and improved analytical techniques.
- Encourage the continued development of on-road vehicle remote sensing or other technologies to enhance high-emitter identification programs for pre-1996 vehicles.
- Continue to evaluate the effectiveness of on-board diagnostic systems, tailpipe emissions testing, and new technologies to identify post-1996 high-emitting vehicles.
- Make use of new technology as it becomes available to improve detection of high-emitters.
- Continue to support State and local inspection and maintenance programs and initiatives designed to repair high-emitting vehicles or remove them from the road.

Implementing these recommendations will have significant, but variable, impacts on air quality throughout the nation, depending on the proportion of high-emitters in local inventories.

**2.13 Conformity** - *Conformity should be retained as part of the nation's AQM system.* The Work Group and the Mobile Source Technical Review Subcommittee wish to emphasize that, in addition to other mobile source initiatives in local nonattainment areas, the overall transportation planning approach embedded in the conformity program should continue to receive substantial federal support. The NRC found that the transportation conformity program has significantly reduced pollution levels in cities around the country, with the greatest impact in nonattainment areas experiencing rapid growth. Furthermore, the program has "fostered greater interaction" between transportation planning and air quality regulatory authorities, resulting in knowledge transfer and mutual respect. Therefore, conformity's current key requirements and schedules must be retained and effectively enforced. Additionally, future administrative action should consider: (1) protecting sensitive populations from localized, elevated particle pollution levels; and (2) expanding emissions budgets under the general conformity program to limit emissions from other significant transportation sectors (e.g., marine ports, rails, airports and freight).

Even with the application of these complementary strategies at the national, regional and local levels, the Work Group recognizes the possibility that certain nonattainment and emissions-transport problems may not be resolved. Further analysis of nonattainment problems projected to persist after implementation of these recommendations may suggest additional controls on certain sectors, and/or alternative or supplementary approaches to improving air quality.

### **NRC 3: Transform the SIP Process**

Among the most immediate and critical areas in which the NRC and the Work Group advocate change is the way SIPs are developed, processed and evaluated. Recognizing that the SIP/TIP process can be cumbersome and time-consuming for S/L/T, the Work Group proposes a number of steps that would improve the SIP process and facilitate more integrated, comprehensive air quality management. These recommendations fall into two categories: 1) immediate changes that will provide incremental improvements by streamlining the SIP process; and 2) additional steps

that begin the longer-term task of transforming the SIP process in more substantial ways. Taken together, these recommendations will improve accountability, promote innovative approaches to air pollution problems, and help integrate key programs and approaches.

## **Streamlining the SIP Process**

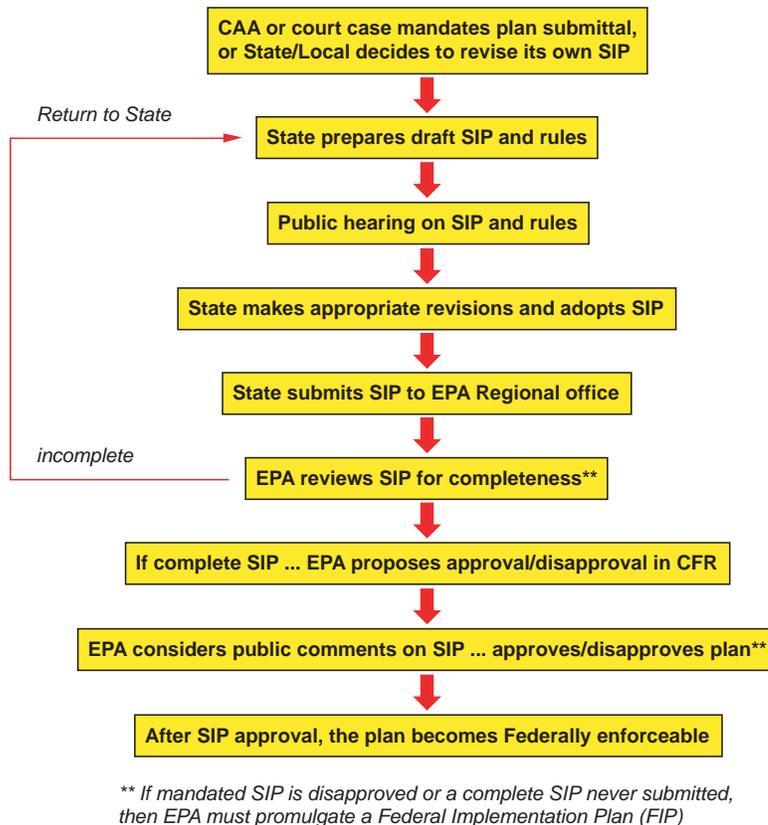
The Work Group recognizes that the SIP process itself (see Figure 11)—the procedures by which the SIP is managed by S/L/T; the timing of key steps; and the way stakeholders are included in the process—could be improved significantly in the near term. Part of creating accountability mechanisms is ensuring that necessary procedural steps are carried out with maximum efficiency and transparency. Here, the Work Group offers several recommendations for immediate actions that could help expedite the SIP process, encourage innovation, and improve communication with stakeholders.

### *Near-Term Procedural Changes to Expedite SIP Development and Processing*

**3.1 Align SIP Submittal Dates** - *Because ozone, PM<sub>2.5</sub>, and regional haze SIPs have similar elements and are likely to contain similar control strategies, EPA, S/L/T and other stakeholders should strive to align the submittal dates of the three SIPs. This recommendation is not intended to suggest changes to any deadlines for attainment or implementation of control strategies, or to imply that a single SIP should be required for ozone, PM<sub>2.5</sub>, and regional haze. It is further recommended that, in the future, EPA should align designation dates as appropriate to promote multipollutant SIP development.* For many States, there is likely to be overlap between the efforts necessary to address 8-hour ozone, PM<sub>2.5</sub> and regional haze problems. The resources saved from a holistic analysis and the development of a single strategy as opposed to several incremental adjustments within a few months' time may be significant. It is difficult for States to accelerate adoption of the PM<sub>2.5</sub> and regional haze SIPs (due in 2008) to coincide with the schedule for 8-hour ozone SIPs (due in 2007). Therefore, EPA should identify incentives (e.g. modeling assistance) it could provide to States to accelerate the preparation of regional haze and PM<sub>2.5</sub> SIPs. It is critical that EPA take rapid action—within the next 6 months—to provide guidance to States in time to impact the current round of SIPs.

**3.2 Protocol for SIP Development** - *Each State should work with the appropriate EPA Regional Office to develop and implement a protocol for SIP development and processing that would lay out responsibilities, expectations, and timelines for all parties. While a model protocol should be developed, the EPA Regional Office and each State should have the flexibility to design a protocol tailored to their specific needs.* The lack of effective and consistent communication between States and EPA historically has been an impediment to development and processing of SIPs. To avoid delays in the SIP approval process and to limit the insertion of new demands by EPA late in the process (after public hearings and legislative action are well underway at the State level), EPA and the States should jointly foster the development of a model protocol within the next six to nine months outlining the SIP process. While the protocol can be tailored to fit each particular situation, it should generally:

- Be flexible enough to address all types of SIP submittals;
- Incorporate regular mechanisms for communication, expected turnaround for EPA review of State materials, and more streamlined processes for simpler SIPs; and
- Include accountability mechanisms.



**Figure 11. Major Steps in the SIP Process.** The Work Group recommends a number of steps to streamline aspects of SIP processing to expedite procedures and save significant resources without sacrificing the benefits of public participation and comment.

**3.3 Clearinghouse of Approved SIPs** - EPA should develop a website, similar to the Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) clearinghouse, containing interpretations of rules and other SIP/TIP approval-related issues. This website could contain both policy and/or technical information depending on how it is developed. Each EPA Regional Office should develop a website, to be updated every 12 months on or about October 1, that identifies and provides links to all statutory and regulatory requirements in the federally approved SIP, including associated State and federal legal citations and effective dates. Because there is no central repository for information about SIP/TIP approvability, the process for finding answers can be very time- and resource-intensive. EPA should give medium priority to developing a clearinghouse that is accessible to States and the public. Additionally, EPA regional offices should standardize the content and quality of websites containing statutory and regulatory requirements for applicable SIPs. This includes providing: (a) a citation of and link to every State statute and regulation; (b) the State effective date; (c) the federal publication date; (d) the federal effective date; and (e) the applicable federal register citation.

**3.4 Streamline Minor SIP Revisions** - For the SIP approval/disapproval phase of the air quality management process, EPA should establish a *de minimis* level for SIP revisions and streamline the processing of these revisions by the use of “letter approvals” or similar expedited procedures signed by the Regional Administrator. EPA should, in consultation with S/L/T and other stakeholders, develop a listing of the types of SIP actions that are eligible for streamlined processing. Many SIP revisions submitted by States are minimal in their scope or impact, yet such submittals must still undergo the full administrative process that is required of

all Federal rulemaking actions. To streamline the revisions approval process and save significant resources, EPA is advised to take action within the next 12-18 months to:

- Develop guidance defining what would be considered *de minimis*, in terms of subject matter, emissions limits, and the process by which such actions would be approved.
- Group in one rulemaking action a series of SIP submittals which meet the *de minimis* criteria.

**3.5 Timely EPA Guidance** - *EPA guidance should be issued in sufficient time for States to meet their SIP development deadlines. EPA should involve S/L/T and other appropriate parties in its guidance development process. In cases where guidance is delayed, EPA should take into consideration States' efforts to meet deadlines without the benefit of the appropriate policy guidance.* Frequently, States must prepare SIPs under a specific deadline, but are dependent on EPA to develop guidance for the SIP. Delay by EPA in preparing guidance can cause States to be rushed or late in meeting their deadlines, or to develop SIPs which have to be revised later. This can lead to strained relationships between EPA and the States, public criticism of the States, and possibly sanctions against the States. Furthermore, greater communication between EPA and other stakeholders in the development of guidance can help reduce implementation problems, resource expenditures, and litigation. Therefore, within the next six months, EPA should institute a new, collaborative process for developing guidance in a more timely fashion. In any Federal Register notice for a final rulemaking, EPA should clarify if and when any additional guidance will be forthcoming. The Work Group hopes that this notice would serve as a deadline to prompt EPA action.

**3.6 Avoid Unnecessary Public Hearings** - *EPA should work with the States and Tribes to develop a model regulation that would require a public hearing for SIP revisions only if one is requested after public notice. This recommendation is not intended to restrict public comment in any way; it is meant only to eliminate those hearings that no one attends.* The CAA has long been interpreted to require that a public hearing be held by States for all SIPs and SIP revisions prior to their submittal to EPA. Holding public hearings is resource-intensive, and while the use of State resources is completely justifiable when interested parties testify at the hearing, in many instances no comments or testimony are offered. A work group comprised of members of EPA's Office of General Counsel, EPA Regional Counsels, States' Attorneys General, and Tribal attorneys should undertake a review to determine whether holding a public hearing only upon request could satisfy CAA requirements for SIP revisions. If so, the work group should also develop a model regulation for States to adopt for SIP approval that provides the circumstances and procedures for holding SIP revision hearings only upon request.

**3.7 Facilitate Redesignation Process for Certain Areas** - *For those areas that have not pursued and been granted redesignation when initially eligible, and have continued to demonstrate violation-free ambient air quality data for several years, EPA should expedite the redesignation process. EPA should ensure that all Regions and States are aware of the simplified procedures. This recommendation is not intended to change the requirements for redesignation under the CAA.* All EPA Regional Offices should disseminate and provide any needed assistance on the implementation of both the May 10, 1995 Clean Data Policy (CDP) and the "Limited Maintenance Plan Option for Moderate PM<sub>10</sub> Nonattainment Areas," commonly referred to as the Limited Maintenance Plan Policy (LMPP). The CDP allows the Part D SIP requirements of an approved attainment demonstration, rate of progress plan and their associated contingency measures to be waived in areas with three or more years of violation free data. Similarly, the LMPP can exempt an area from modeled maintenance

demonstration. These policies change and simplify the technical requirements for redesignation, not the legal requirements.

## Measures to Improve Communication to the Public

**3.8 Effective Communication with Constituencies** - *EPA, along with S/L/T, should develop a menu of options for effective communication to build support with a wide variety of constituencies for clean air plans at the S/L/T level.* The SIP/TIP planning process is cumbersome, lengthy and difficult for the public to comprehend, which hinders plan development and air quality improvements. Successfully engaging the public early in the SIP/TIP development process builds general understanding and support. Some States and Tribes have done this successfully, but other States could improve their outreach efforts, particularly by fostering collaboration at the local level. EPA should also develop outreach materials for diverse audiences explaining the SIP/TIP process and the health effects of air pollution.

**3.9 Co-Benefits of Innovative Measures** - *EPA and S/L/T should work collectively to communicate the co-benefits associated with innovative measures.* In keeping with the previous recommendation, it is important for S/L/T to tailor their communication strategies to the concerns of their audience(s). The public is concerned with basic goals, such as improving public health and increasing economic and environmental benefits, when considering pollution control alternatives. Overemphasis on receiving SIP credit for new and innovative types of pollution control initiatives limits public understanding and support for such initiatives. Therefore, EPA and S/L/T should communicate how proposed strategies and innovations would improve quality of life more generally.

## Steps to Increase Adoption of Innovative Measures

**3.10 Innovative and Voluntary Measures** - *EPA should encourage States' and Tribes' efforts to implement innovative measures by providing enhanced flexibility, SIP/TIP credit guidance, technical support, and funding for innovative and voluntary programs.* Some areas have implemented most of the readily available traditional emissions control strategies, but still have not met air quality goals. As areas consider new strategies to attain the NAAQS, EPA should continue to develop policy and technical guidance to provide States with the flexibility to utilize innovative emission reduction strategies in their SIPs. The Work Group recommends that within 6 to 9 months EPA should: 1) clarify and expand the channels through which States may gain SIP/TIP credit for innovative measures by issuing additional enabling guidance and by balancing the level of effort required for approval (recordkeeping, reporting, etc.) with the level of environmental benefits; 2) create a clearinghouse for information on new technologies, innovative approaches, mentoring resources, and “off-the-shelf” measures, pilot projects, and quantification techniques; 3) develop sector-based guidance that would synthesize and clarify innovative technological approaches to reducing pollution in key sectors; and 4) continue to offer targeted funding to promote innovation.

**3.11 SIP Credits for Bundled Innovative Measures** - *EPA should incentivize innovative pollution control strategies by offering SIP/TIP credit for “bundled and discounted” measures.* States and Tribes are often discouraged from adopting innovative measures because those measures are typically too small scale to result in significant SIP/TIP credit. In addition, results of those measures may be hard to quantify or verify individually. In the aggregate, however, such measures can provide significant air quality benefits. EPA has recently increased the

amount of presumptive SIP credit States can earn for stationary-source innovative measures to 6 percent through its guidance on Incorporating Emerging and Voluntary Measures in a SIP (September 2004). The Work Group recommends that EPA build upon this initiative by granting States and Tribes SIP/TIP credit upfront for a “bundle” of small, innovative measures, with an appropriate discount to deal with the uncertainty embedded in these untested measures. The impact of the bundled measures on air quality should be evaluated in the aggregate. Each approval of “bundled” measures in a SIP will need to be conducted through full notice-and-comment rulemaking in the context of a particular State SIP revision.

## **Steps toward Transformation: Improving SIP Development and Evaluation**

In addition to the near-term steps for streamlining SIPs outlined above, the Work Group recommends a number of other changes regarding the development of SIPs that should be initiated now and pursued over the course of the next several years. These more fundamental changes can only be accomplished over a longer time period. These recommendations focus on the nature of the federal/State/Tribal partnership, and on increasing the role of tracking progress and mid-course corrections. Specifically, the Work Group recommends that the current SIP process can be transformed in the following ways:

### **Increasing Collaboration in SIP Planning and Control-Strategy Development**

**3.12 Regional Approaches to SIP Planning** - *For many areas, planning for new SIPs or major revisions to existing SIPs for two or more separate nonattainment areas that are both part of the same regional-scale air quality problem should be coordinated. If requested by a State, EPA should work with the different nonattainment areas, Tribes and combinations of multistate organizations and other stakeholders, as appropriate, to assist in the development of regional approaches to planning. This could include technical assistance such as modeling, national or regional control strategies, model SIPs, and model rules as templates for S/L/T adoption.* State-by-State planning without proper coordination can result in a patchwork of regulations and numerous stakeholder conflicts. As discussed in the previous section of this report, the nature of many areas’ 8-hour ozone and PM<sub>2.5</sub> problems increasingly calls for the development and implementation of regional control strategies. In several areas, Regional Planning Organizations (RPOs) and Multi-Jurisdictional Organizations (MJOs) are being used successfully to develop model SIPs for regional haze (e.g. the Western Regional Air Partnership) or ozone (e.g. the Ozone Transport Commission). The Work Group recommends expanding such efforts within the next year to aid States in developing their ozone and PM<sub>2.5</sub> SIPs. Specifically, RPOs and MJOs can assist with developing model rules and SIPs, and developing standardized technical support documents. EPA should encourage flexibility in the use of grant funds allocated to RPOs and MJOs so they address multiple ambient air pollution problems under the “one atmosphere” approach, ensuring that the most scientifically valid and cost-effective approaches are evaluated and implemented.

**3.13 Federal and State Partnership** - *EPA should participate with S/L/T in the SIP/TIP development process to identify and pursue emissions reductions from important source categories, especially those that only the federal government has the ability to address, such as federal and international sources. The level of control sought from these sources should be commensurate with their impact on the nonattainment area. As warranted by the nature of the source, control strategy development should be carried out by S/L/T working either directly with EPA or with EPA and other federal agencies. For attainment demonstration purposes, States should be able to take appropriate credit for anticipated reductions from these sources*

*(whether the reductions are from regulatory or incentive programs) so long as the control strategy and its anticipated impact are found to be consistent with EPA regulation and guidance. States and Tribes often struggle to control existing sources, such as mobile sources, federal sources, or international sources, over which they have limited regulatory authority. The Work Group suggests that EPA and S/L/T could collaborate more successfully to control such sources so that the 8-hour ozone and PM<sub>2.5</sub> standards can be met. Specifically, within each nonattainment area, EPA should work with S/L/T to:*

- Identify and reduce emissions from national and international sources, in part by cooperating with international standards-setting bodies and participating in international agreements with neighboring countries;
- Reduce relevant emissions from federal sources, cooperating with other federal agencies as necessary;
- Expedite the approval of new technologies that can be applied to existing local mobile source fleets; and
- Develop new strategies, including multijurisdictional strategies, targeting sources that are difficult to control at the State or Tribal level in order to help local areas achieve attainment.

### **Steps to Improve Tracking and Evaluation of Results**

As the NRC report stressed, it is important to push the current AQM system towards a more performance-oriented approach, one that measures both outputs and outcomes and ties them together in meaningful ways. While the comprehensive vision outlined by the NRC will require the kinds of assessment and research outlined in Recommendation 1.5, the Work Group believes that there are important steps that can be taken to improve methods and metrics for tracking pollution outputs, translating them into impacts, and creating feedback loops to adjust policies and programs to make them more effective in improving public health and welfare. Specifically, the Work Group recommends:

**3.14 Weight-of-Evidence Demonstrations** - *In order to move beyond the current approach of relying on air quality modeling, EPA, in conjunction with S/L/T and affected stakeholders, should modify its guidance to promote weight-of-evidence (WOE) demonstrations for both planning and implementation efforts. In particular, these demonstrations should reduce reliance on modeling data as the centerpiece for SIP/TIP planning, and should increase use of monitoring data and analyses of monitoring data, especially for tracking progress. The current system is top-heavy on modeling for planning purposes, especially during the preparation of an attainment demonstration, and light on tracking progress. Enhanced tracking and ambient monitoring data is a better use of available resources than intensive local modeling. As such, EPA, in conjunction with S/L/T, should:*

- Incorporate a WOE approach in planning efforts to provide the most technically defensible basis for a control plan and to satisfy any statutory requirement for a demonstration of attainment. The WOE approach should include three elements:
  - A prospective modeling analysis to identify the appropriate control path;
  - Analyses of air quality data; and
  - Summaries of current actual and expected future year emissions.

- Consider WOE elements such as retrospective modeling analysis (as necessary), analyses of air quality data, and summaries of actual emissions in implementation efforts (i.e., periodic progress assessments, as discussed in Recommendation 3.15).
- Issue WOE guidance, which clarifies the proper role of modeling for SIP planning, establishes standard WOE procedures, and identifies appropriate data analysis methods (e.g., estimating statistically significant trends).

**3.15 Periodic Assessments to Track Progress** - *S/L/T and EPA should conduct periodic assessments to ensure that areas are on track to meet NAAQS, air toxics, and visibility goals, and make mid-course adjustments, as necessary.* To lay the foundation for a performance-oriented approach, and to help build a stronger framework for accountability, over the next two years:

- States, Tribes, and EPA should work together on tracking progress, including a review of changes in actual emissions and air quality concentrations, as described in Recommendation 3.14.
- If actual progress differs “substantially” from the expected trend for a given metric, then S/L/T should reexamine effectiveness of that attainment measure. If attainment will be later than the statutory attainment date, then the S/L/T authorities should determine whether it is necessary to modify the SIP.
- EPA should report annually on health and ecosystem impacts (i.e., indicators and benchmarks established pursuant to Recommendation 1.5).
- EPA should report annually on major control programs that it is coordinating (e.g., Title IV and NO<sub>x</sub> SIP Call).

In accordance with this recommendation to improve program evaluation, the Mobile Source Technical Review Subcommittee recommended the Work Group highlight one particular program for detailed evaluation:

**3.16 Averaging, Banking, and Trading in Gasoline Sulfur Program** - *EPA should evaluate the averaging, banking, and trading (ABT) provisions included in the Tier II gasoline sulfur regulation to see if they are effective.* Averaging, banking, and trading (ABT) provisions have been widely used by EPA to provide flexibility to industry while aggressively addressing environmental problems. EPA should evaluate the effectiveness of these provisions in the gasoline sulfur program as that program develops over the next few years. The evaluation should consider the distribution of credits; the volume and nature of trading; the impact of trading on firm-level performance; and the overall administrative performance of the program. The evaluation should include annual analysis of available information and a complete report when the program has been fully implemented and patterns of credit usage are well established. EPA should consider conducting a similar analysis for ABT when it implements the diesel sulfur program.

In addition to the specific example of program evaluation noted above, the detailed text of Recommendation 1.5 in Appendix B notes several other programs that EPA should consider for evaluation, such as the NO<sub>x</sub> SIP call and the Clean Air Interstate Rule (CAIR).

All of the above recommendations on SIP processing, SIP development, planning, communications, innovations, and tracking will help improve the current SIP process by making it more efficient and more effective. These changes should all be implemented in the near term,

some because they are designed to help S/L/T with the upcoming round of SIPs for ozone, PM<sub>2.5</sub> and regional haze, and others because they represent initial steps that will form the basis for longer-term initiatives necessary to transform the SIP process as the NRC recommended.

## **NRC 4: Develop Integrated Program for Criteria and Hazardous Air Pollutants**

The Work Group believes it is also possible to take immediate steps toward controlling criteria and toxic air pollutants (also known as hazardous air pollutants or HAPs) in a more integrated fashion. The Work Group agrees with the NRC that this is a critical task in the air quality management arena, and one that has often been neglected in the past. While fully integrated pollution control is a difficult task that will take many years and substantial reorganization of the entire air quality management framework to accomplish fully, the earlier recommendations for sector-based approaches and multipollutant control strategies (2.1 – 2.13) represent some of these steps. The following additional steps will also promote greater integration of programs designed to control criteria and toxic air pollutants:

**4.1 SIPs to Address Multipollutant Impacts** - *For the SIPs States are required to submit over the next several years, EPA and S/L/T should promote the consideration of multipollutant impacts, including the impacts of air toxics, and where there is discretion, select regulatory approaches that maximize benefits from controlling key air toxics, as well as ozone, PM<sub>2.5</sub>, and regional haze.* The SIP process provides an opportunity for many urban areas to include key toxic air pollutants in a comprehensive, multipollutant air quality plan. While in no way reducing federal responsibilities for air toxics, this recommendation envisions SIPs/TIPs as providing an opportunity to see how S/L/T efforts are also reducing key air toxics, to identify what actions could be taken at the S/L/T level to supplement current federal efforts, and to help identify priorities for federal action. EPA should focus on developing a “short list” of critical toxic air pollutants and other widespread pollutants that pose the highest risk to human health in urban areas. In developing this list, EPA should consider including benzene, acrolein and diesel PM, and other widespread pollutants. EPA should encourage S/L/T in developing their SIPs/TIPs for PM<sub>2.5</sub>, regional haze and ozone, to evaluate opportunities for achieving co-benefits through simultaneous reduction of these key “urban risk driver” air toxics and any other air toxics which are of high risk in their area. Because of the urgency of this task, EPA should work with stakeholders to develop and test a model integrated SIP as a pilot project by the end of 2005.

**4.2 Multipollutant Benefits and Disbenefits in Standards Setting** - *EPA should explicitly outline and quantify multipollutant benefits and disbenefits when setting emissions standards.* As part of its attempts to encourage integrated air quality planning, EPA should utilize the ongoing air toxics standards-setting process (e.g., remaining Maximum Achievable Control Technology (MACT), residual risk, and area source standards) to explicitly consider multipollutant effects of proposed control strategies in selecting options. Specifically, when conducting engineering reviews to support emissions standards efforts, EPA should assess how options identified for controlling air toxics reduce and/or increase direct PM<sub>2.5</sub> emissions, and emissions of PM and ozone precursors such as VOC, NO<sub>x</sub> and SO<sub>2</sub>. Furthermore, engineering reviews for air toxic standards should catalog available control options that would reduce direct PM, SO<sub>2</sub>, VOC and NO<sub>x</sub> emissions even if those options would not reduce air toxics.

**4.3 Greenhouse Gas Co-Benefits and Disbenefits** – *EPA should assist States, and localities, in quantifying the potential greenhouse gas co-benefits and disbenefits of emissions*

*reduction measures primarily designed to address ozone, PM<sub>2.5</sub>, regional haze and air toxics.* In evaluating control measures, EPA should assist States and localities in quantifying potential greenhouse gas emissions increases and decreases. Many States and localities have adopted policies to assess and/or reduce greenhouse gas emissions. Under this recommendation, where requested, EPA should support a State's or localities efforts to determine how pollution reduction alternatives might also impact greenhouse gas emissions.

These multipollutant measures are very important to advancing the core goals outlined at the beginning of this report. These recommendations promote integration of air quality programs and approaches, thus addressing one of the main points of the NRC report. They also enhance accountability by providing more meaningful data about emissions and their likely impact on health and the environment. Combined with some of the measures discussed earlier about improving tracking, monitoring, and health/ecosystem indicators, these recommendations will help us measure progress toward desirable outcomes and design more effective and efficient pollution control strategies.

## **NRC 5: Enhance Protection of Ecosystems and Public Welfare**

Finally, the Work Group agrees with the NRC that a great deal of work remains to be done in the areas of ecosystem protection and public welfare improvements. These are, in essence, the most fundamental goals of the air quality management system, and while substantial progress has been made on both fronts in the past thirty years, there are important gaps which require new approaches and new resources to address. The Work Group has focused on identifying a list of critical needs that could serve as the foundation for long-term progress in the protection of ecosystems and public welfare.

**5.1 Program Review to Improve Ecosystem Protection** - *EPA should, in parallel with recommended scientific and technical work, begin now to examine current and alternative clean air related policies and programs to develop approaches that would advance the protection of ecosystems from the adverse effects of air pollution. Alternatives that should be evaluated include a regional cap-and-trade program, protection of ecosystems based on critical loads, and a State-wide planning program for protecting and enhancing air quality in areas that attain the NAAQS (including National Parks and Wilderness Areas).* The NRC stated that the system of air quality management in the United States does not go far enough in protecting ecosystems and other aspects of public welfare from the impacts of air pollution. The NRC noted specific policy-related deficiencies in secondary NAAQS, tracking of ecosystem outcomes from air quality changes, and accounting for ecosystem effects in cost-benefit analyses. The Work Group agrees with this assessment, and recommends that, in addition to developing innovative benchmarks and measures to assess the ecological impacts of air pollution and improving ways to track and evaluate progress (see Recommendation 1.5), EPA should also assess the current and potential effectiveness of major clean air programs in providing ecosystem protection. In its assessment, EPA should consider a number of features of each program:

- a) policy mandates, objectives, goals, definitions of ecosystem protection, and historic/legal interpretation;
- b) characteristics of the air pollutant(s) regulated, and potential magnitudes of impact;
- c) existing measures for reporting program progress and ecosystem impacts;

- d) desirable modifications to existing tracking efforts to support their application to different regulatory programs;
- e) current and future opportunities or impediments to expanding the use of ecological science in the policy context; and
- f) policy innovations or revisions that would help translate ecosystem science into effective ecosystem protection policies.

EPA should also assess the impact of non-regulatory programs, such as the Sustainable Environment for Quality of Life (SEQL) project in Charlotte, NC, on the protection of ecosystems. This project involves innovative efforts to integrate air pollution effects with other ecological concerns, and may serve as a model for future regulatory approaches.



**Figure 12. Wetland Ecosystem in NY.** Regional air deposition is a significant source of pollution to aquatic and terrestrial ecosystems in some areas of the U.S.

Photo credit:  
K. Mirza/S.Olson



## **Unresolved Issues for Further Discussion**



## Unresolved Issues for Further Discussion

Given sufficient resources, most of the recommendations outlined in this report so far could be implemented within the next 1 to 5 years under the current statutory framework. Such short-term changes are desirable, even critical, for helping S/L/T meet the air quality challenges they currently face. In addition to these recommendations, the Work Group also discussed a number of other changes to the AQM system that might be beneficial. While some of these issues provoked controversy within the Work Group, and no consensus was reached on how to handle them, they represent opportunities for further improvements in the near- or long-term and deserve mention here. The Work Group expects discussion of these issues to continue, and hopes to make additional recommendations over the next several months.

Included in this group of topics for future discussion were scientific and technical issues such as: increasing the number and distribution of air quality monitors; implementing more short-term monitoring programs; improving the process through which emissions inventories are developed; and promoting the use of multipollutant and multimedia technical tools.

In the policy and planning arena, the Work Group also had a number of unresolved issues. Among them were: improving the transparency and consistency of the SIP process; the possible role of geographically dispersed emissions reductions and whether they should be counted in SIPs for nonattainment areas; improving the communication of technical information to policymakers; integrating programs for criteria pollutants and toxic air pollutants more fully; and accounting for pollutant tradeoffs from different emissions control technologies during permitting at individual facilities. Many of these issues were considered medium or low priority compared to the recommendations listed in this report, or were so complex that the Work Group believed that it was premature to attempt to make recommendations at this time. Pending further discussion, additional recommendations may be forthcoming in these areas at a future date.

The Work Group discussed at length the electricity generating unit (EGU) sector because of the large contribution that this sector makes to multiple air quality problems, but was unable to reach consensus. Many on the Work Group believed that the active rulemaking underway on the Clear Air Interstate Rule (CAIR) provided the proper forum for considering what this sector ought to do for the next 15 years or more; others did not. Since no agreement could be reached on a recommendation regarding this sector, the Work Group recommends that discussions continue by the new CAAAC subcommittee. Regardless of the outcome of any future discussions, many of the stakeholders involved saw value in S/L/T and utilities consulting with each other after final promulgation of the CAIR (or new legislation) to share compliance plans, evaluate likely emissions reductions and their geographic distribution, and apply that information to further planning activities.

All of these issues deserve further consideration and remain on the Work Group's agenda for the future. While some of them may involve irreconcilable conflicts among stakeholders, it is the Work Group's hope that gathering additional evidence and continuing deliberations may produce a number of follow-up recommendations that would accompany those outlined in this report.



# **Looking Forward: Long-Term Realignment of the AQM System**



## Looking Forward: Long-Term Realignment of the AQM System

Among its many tasks, the Work Group also considered more sweeping changes to the AQM framework in the United States. Such a broad-scale endeavor is necessarily a long-term project, requiring a great deal of discussion and negotiation among stakeholders. Still, the Work Group believes it is possible to outline some aspects of a new long-term vision. These aspects must be taken up in greater detail in the upcoming months as the reevaluation of AQM in the United States moves forward.

In its discussions about long-term issues, the Work Group focused on identifying core principles around which future air quality programs should be organized. These core principles offer the opportunity to build highly effective programs to address emerging and future air quality problems by capturing past successes and incorporating new approaches. On top of these core principles, the Work Group drafted a series of Framework Options: approaches to air quality management that implement the core principles in different ways. Below, the core principles are described, followed by a brief description of four possible Framework Options. These options need further evaluation and discussion before any recommendations can be made by the Work Group to the CAAAC.

### Long-Term AQM Vision: Core Principles

Members of the Work Group identified ten major principles that should be further considered in future deliberations of the long-term vision.

1. Expand application of and develop national and/or regional measures for all source sectors (stationary, area, and mobile) to address air pollution in a nationally and/or regionally consistent manner.
2. Integrate multipollutant considerations when addressing emissions reduction requirements and developing control programs.
3. Include emissions reductions approaches from “non-traditional” sources and “non-traditional” (i.e., innovative) approaches (as well as from traditional sources and approaches) when developing plans and programs to achieve clean air goals.
4. Make the SIP process simpler, more effective and more efficient.
5. Ensure periodic review of progress to determine whether public health and environmental protection goals are being achieved.
6. Ensure that innovative and market-based programs yield the desired levels of public health and environmental protection, as well as being economically efficient.
7. Incorporate land use and transportation planning in clean air planning efforts.
8. To the extent feasible, integrate health risk during control strategy program design.
9. Maintain and protect States' and Tribes' authority to reduce emissions in order to protect public health and the environment, and meet and maintain air quality standards.
10. Integrate air quality management with national energy policy to ensure coordination and mutual support between energy policy and air quality policy.

The Work Group did not presume that the CAA would necessarily need to be changed in order to move in the direction of these principles, although some approaches would likely not be achievable without statutory change. The NRC report recognized that the current AQM system has been and continues to be effective in many aspects. The current system provides a firm foundation to address present challenges and flexibility to adapt to developments in science and changes in policy. Consideration of changes to the current system warrant serious and thoughtful discussion in light of the goals to be achieved and the ultimate goal of continued progress towards clean air.<sup>9</sup>

The Work Group envisions that future AQM efforts will involve a heightened role for the federal government to issue national or regional programs covering multiple source sectors. These programs and this approach will be necessary to support State, local and Tribal governments as they address their nonattainment problems by assisting them in addressing multipollutant interactions and pollution transport. Under the CAA, the federal government has largely an oversight role. State, local, and Tribal governments are responsible for nearly all air quality implementation tasks. Furthermore, the current system does not currently implement mechanisms and processes adequate to address the significant impact of sources outside nonattainment boundaries. The mechanisms provided by the CAA to address pollution transport to date (SIP calls and petitions) can result in individual progress. Federal technology-based controls targeting various industrial sectors could achieve more integrated planning and address multipollutant interactions.

Even with a greater federal presence, S/L/T will still have considerable work ahead in order to meet their air quality challenges and responsibilities—they hold ultimate authority and responsibility for attaining and maintaining the NAAQS and protecting public health. By streamlining the currently burdensome SIP process, incorporating innovative and multipollutant solutions, developing better ways to track progress, enhancing States' and Tribes' ability to address transported pollution, and crafting new controls on sources that only the federal government can regulate, the AQM system can promote cleaner air across the nation.

## **Long-Term Framework Options**

The Work Group has developed four options for a new long-term AQM framework. These options share some of the core principles discussed above; in this sense, there is some overlap in the approaches described. However, in other respects the options are quite distinctive, both from the current AQM approach and from one another. These options are all in their infancy: while they have been subject to much discussion within the Work Group, that discussion served to highlight the complexity of the decision the nation faces in altering the current AQM system in any significant way. Therefore, rather than attempting to flesh out any “favored” option and recommend its adoption, the Work Group chose only to outline the four options. By presenting the options in this manner, the Work Group hopes to carry forward its internal discussions into the wider public sphere where these and other options will be given more considered attention.

### **Option 1: National Technology-Based Standards**

Under this option, all stationary sources nationwide that emit above a specified threshold of a criteria pollutant or HAP would be required to reduce emissions of the full set of pollutants. New sources would be required to install state-of-the-art controls equivalent to LAER, while emissions

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<sup>9</sup> NRC Report, p. 22.

from existing sources would be capped at a level that reflects the nationwide installation of technology no less stringent than BACT with existing sources required to meet a specified minimum level of control.

Individual States would not need to go through the standard-setting process, but would retain their authority to adopt more stringent standards as necessary. To enhance flexibility, the option would incorporate emissions trading for some pollutants and would offer the possibility of reduced NSR obligations. A similar, national performance standard approach would be used for area sources. For mobile sources, EPA would expand its existing mobile source programs by regulating all HAPs from mobile sources and their fuels, and establish new national standards for remaining source categories, such as locomotives, marine engines and aircraft. Further reductions could come from a national mandatory diesel retrofit program and other restrictions on mobile sources and fuels.

States and localities would be responsible for conducting ambient monitoring of criteria pollutants and HAPs to identify where unacceptable pollution levels persist after the application of national performance standards, and for ultimate attainment and maintenance of the air quality standards. In fulfilling these responsibilities, they would be subject to a “SIP lite” requirement, whereby they would develop local plans to address remaining air pollution problems.

## **Option 2: Meeting Environmental Goals with Emissions Caps and Trading**

Modeled after the successful CAA Title IV acid rain trading program, a second option would be to set caps for emissions from certain source categories and allow trading. As in Option 1, the federal government would take the lead in controlling sources, with States responsible for addressing hotspots, residual risk, and transportation and land use planning measures. This approach is probably most amenable to large and medium stationary sources, but could also be applicable to some smaller stationary and area sources, if minimum criteria for participation in a trading program could be met.

This approach’s coverage would be national and involve all major air pollutants, but could be regional for a given pollutant if certain demonstrations were made. In general, control programs should cover most sources within a source category, controlling 90 percent of emissions of each major pollutant from the category. Most sources would have an emissions control obligation, but would not necessarily need to make reductions on-site. Individual emitting sources would not be able to opt out of regulation altogether, but could receive compliance flexibility in a sector that is not regulated with emissions trading.

Trading would be allowed across participating stationary and area sources for criteria pollutants. Trading might be restricted for air toxics to prevent hotspots, and trading between mobile and stationary sources would not be permitted. Initial caps/reduction targets would be set quickly (within five years) based on cost-effective control levels and adjusted periodically (every eight to ten years) considering emissions reductions needed to meet environmental goals. This would provide long lead times for technology advancement and a high degree of certainty to industry while providing a mechanism for continuous improvement towards environmental goals. Allowance allocations would also be used to encourage technology advancement. All new sources would be required to meet state-of-the-art controls.

### **Option 3: Multipollutant, Performance-Based Standards**

A third option would establish innovative technology-promoting programs and national or regional multipollutant performance standards. The program would be national or regional, depending upon the sector and the air quality objective, and would cover criteria pollutants and toxic air contaminants. The multipollutant performance standards would be designed to achieve attainment and other appropriate air quality objectives (e.g., visibility, risk reduction) in most parts of the country. The States would be responsible for addressing residual nonattainment.

The program would apply to most sectors, including stationary, mobile and area sources. New sources would be required to install “best integrated control technology,” which EPA would establish on a sector-by-sector and multipollutant basis after consideration of several factors, including the technology’s impact on criteria pollutant and toxic air pollutant emissions, and any adverse macroeconomic impacts. Most existing sources would be required to comply with a multipollutant emissions reduction obligation set by EPA based on various sector-specific considerations, including public health, ecosystem, energy, technical, economic, and market considerations.

The program would also include demand-side and incentive-based strategies to encourage the development and use of clean technologies. These strategies include a pre-certified credit program; a clean air investment fund; and retail choice, transportation mode choice and energy choice programs. This option would also include measures to ensure that trading does not interfere with risk-reduction or public health benefits.

### **Option 4: Continuous Improvement Program**

A fourth option, based on the Toxics Release Inventory, would set reporting standards for all major stationary sources and require an annual report of all relevant air emissions (HAPs, criteria pollutants, and criteria precursors). The reporting could be done by source category or on a national basis. The program would provide a metric to determine the relative pollution efficiency of the facility (pollution per unit of production).

A threshold would be set above which facilities would be required to control emissions within a three- to five-year period. Emissions trading would be permitted and sources that went beyond compliance could bank the credits in accordance with national rules. The program would be adjusted on a cycle set forth in the rule (three to five years). Annual reports would serve as a benchmark to let everyone know how a facility ranks, thus creating a reduction incentive. New major sources would be required to install state-of-the-art control equipment. Because of the continuous improvement features of the program, NSR requirements could be lessened or removed. Program safeguards for attainment demonstrations and increased risk to the public from HAPs would have to be established.

Certain area sources (e.g., consumer products and solvents) could be controlled by this approach, while others would be controlled using traditional CAA programs. Innovative programs could be implemented at the national and local levels to effectively address these sources. Area sources that represented a large portion of the national inventory may require rule making at a regional or national level.

### **Moving Forward: Continuing the Evaluation Process**

These options represent four models out of many that could be developed as alternative futures for air quality management efforts in the United States. Though each option has some strong

features, in each case many questions about a new AQM framework remain unanswered, including:

1. How the federal and S/L/T governments would interact under a scheme that envisions sharing the responsibilities previously reserved for S/L/T governments, and how jurisdictional responsibilities would be defined;
2. How risk and economics would be factored into the decision-making process;
3. What is the role of energy, land use and transportation planning under the new paradigm;
4. How innovative solutions (including pollution prevention) are incorporated into the approach;
5. How the responsibility of various sources/sectors is determined under this process; and
6. How the various pollutants relate to each other and the environment in a multipollutant program.

These challenging questions should be addressed in any future discussions on recommendations for a long-term course of reform. Answering these questions and properly evaluating all of the nuances and implications of the options described above, as well as other possible options, will require detailed consideration by the CAAAC and an extensive dialogue between stakeholders. The Work Group recommends that this process of evaluation be carried forward during the next year, along with the implementation of the near-term recommendations outlined in this report.



## **Conclusions**



## Conclusions

The Clean Air Act has been one of the most successful and cost-effective environmental statutes enacted since 1970. As described at the outset of this report, over the last three decades the nation has achieved major reductions in air pollution while population, energy consumption, gross domestic product, and vehicle miles traveled have expanded. The Clean Air Act provides a strong foundation for the protection of public health and the environment, offering powerful control mechanisms to combat serious pollution problems while also remaining flexible enough to accommodate advances in scientific knowledge and new policy priorities.

Despite the substantial improvements in air quality over the past 30 years, however, there are important challenges ahead. As the most obvious pollution problems have been solved, other problems have moved into the spotlight. Advancing scientific research indicates that human health is threatened at very low levels of pollutant exposure, and toxic hotspots continue to affect localized populations. The impact of air pollution on ecosystems also needs further scientific study and policy action.

In order to address these challenges, we must adopt new approaches to air pollution control. In addition, we must acknowledge that traditional approaches to controlling air pollution, while effective, have not always been efficient. Recent experience with cap-and-trade mechanisms and other market-based approaches has shown that there is room to improve the efficiency with which pollution reductions are achieved. As we move forward with air quality management efforts, we must look for additional opportunities to streamline processes and enhance program efficiency.

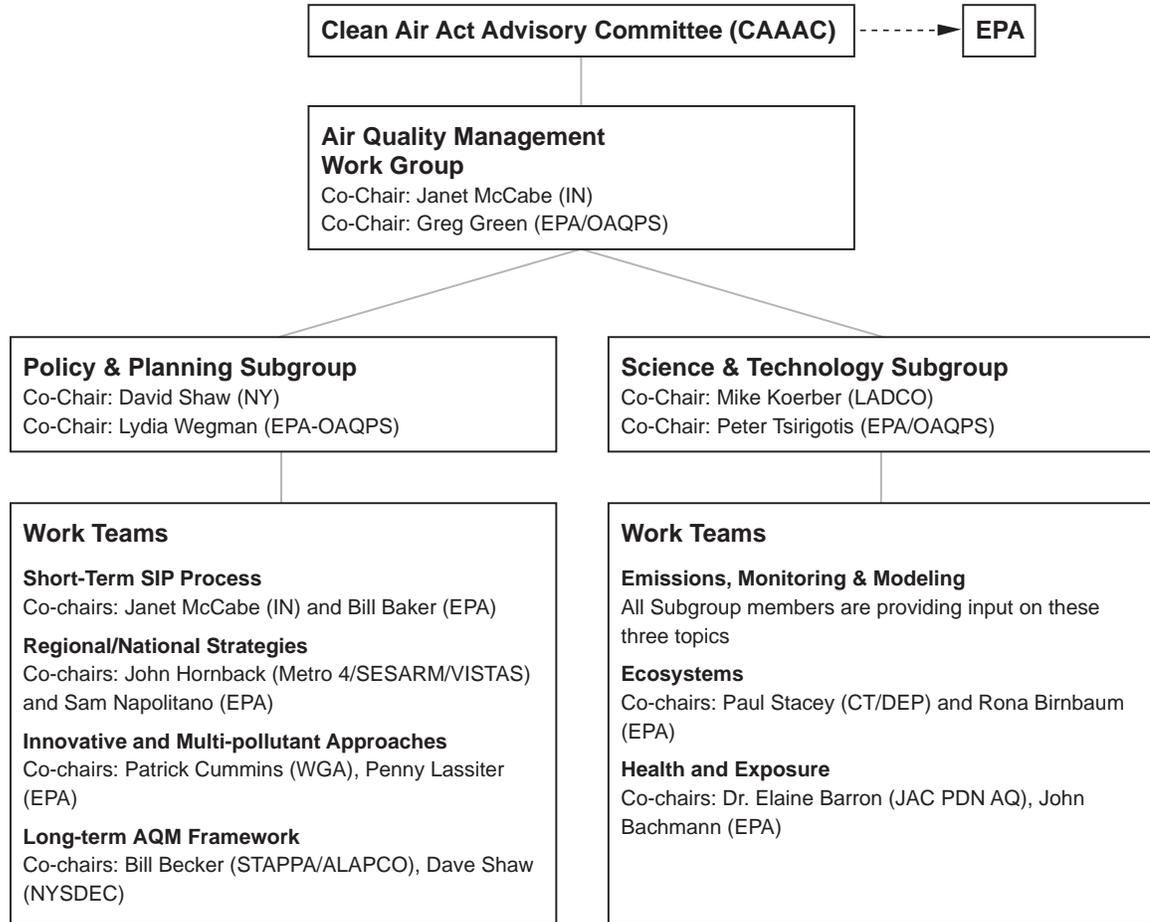
The recommendations presented in this report offer concrete opportunities to improve the efficiency and effectiveness of current air quality programs. These recommendations build on the existing Clean Air Act and help enhance the current framework. They also serve as building blocks for potential long-term change. The report only begins to describe some of the possibilities before us as we move into a new era in air quality management. With the success of the past thirty years behind us, we should carefully consider the opportunities for improving air quality in the future, and move forward deliberately and enthusiastically to address new challenges.



# **Appendix A: Air Quality Management Work Group**



## Appendix A: Organizational Structure for Response to CAAAC on NAS Report:



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## **Appendix B: Recommendations Matrix & Background Papers**



## Appendix B: Recommendations Matrix & Background Papers

### Recommendations Matrix

<b>NRC 1: Strengthen scientific and technical capacity</b>		
<b>Number</b>	<b>Recommendation</b>	<b>Priority</b>
<b>1.1</b>	<b>Emissions Measurements and Reporting</b> - EPA, in conjunction with S/L/T and affected stakeholders, should pursue improved emissions measurements and reporting to enhance emissions databases for more accurate air quality assessments and tracking of progress.	<b>High</b>
<b>1.2</b>	<b>Emissions Factors and Estimation Methods</b> - Where emissions measurement-based information is impractical to obtain for air quality assessments, or where improved projections are needed, EPA, in conjunction with S/L/T and affected stakeholders, should improve emissions factors and emission estimation methods.	<b>High</b>
<b>1.3</b>	<b>Uncertainty in Emissions Inventories and Modeling</b> - EPA, in conjunction with S/L/T and affected stakeholders, should quantify and take actions to reduce uncertainty in emissions inventories and air quality modeling applications, provide guidance for incorporating uncertainty assessments into SIP planning, and improve communication of uncertainty to decision-makers.	<b>High</b>
<b>1.4</b>	<b>Multipollutant Monitoring</b> - EPA, in conjunction with S/L/T and affected stakeholders, should promote and improve integrated, multipollutant monitoring.	<b>High</b>

<p><b>1.5</b></p>	<p><b>Framework for Accountability</b> - EPA, in conjunction with atmospheric scientists, health and ecosystem experts, S/L/Ts, and affected stakeholders, should undertake a systematic effort to track air quality achievements and evaluate air program results. This effort should begin by focusing on the progression and associations of air emissions as they interact and ultimately affect human health and the environment. In order to move beyond the current approach of relying predominantly on air quality measurements, we need to further develop and apply the capacity to monitor, assess, and report on how changes in emissions impact air quality, atmospheric deposition, exposure, and effects on human health and ecosystems. Emphasis should be placed on developing and enhancing appropriate health and ecosystem indicators, benchmarks, and subsequent analyses within this overarching accountability framework.</p>	<p><b>High</b></p>
<p><b>NRC 2: Expand national and multistate control strategies</b></p>		
<p><b>Number</b></p>	<p><b>Recommendation</b></p>	<p><b>Priority</b></p>
<p><b>2.1</b></p>	<p><b>Industrial, Commercial, and Institutional Boilers</b> - EPA should complete as soon as possible a review of the contributions from this category and the technical and economic feasibility of further controls, given the high priority assigned to this sector. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.</p>	<p><b>High</b></p>
<p><b>2.2</b></p>	<p><b>Industrial Surface Coatings</b> - EPA should complete as soon as possible a review of the contributions from this category and the technical and economic feasibility of further controls. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.</p>	<p><b>Medium</b></p>
<p><b>2.3</b></p>	<p><b>Non-Industrial Solvents</b> - EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., national rules) for this category using the volatile organic compound (VOC) content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.</p>	<p><b>Medium</b></p>

<p><b>2.4</b></p>	<p><b>Architectural Coatings</b> - EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., national rules) for this category using the VOC content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.</p>	<p><b>Medium</b></p>
<p><b>2.5</b></p>	<p><b>Heavy-Duty Diesel Engines</b> - EPA should reduce emissions from the existing fleet of heavy-duty diesel engines by employing a multi-pronged approach.</p>	<p><b>High</b></p>
<p><b>2.6</b></p>	<p><b>Emissions from Ships, Locomotives, and Aircraft, and Mobile Source Air Toxics</b> - EPA should address emissions from ships, locomotives, and aircraft, and mobile source air toxics through national emissions standards.</p>	<p><b>High</b></p>
<p><b>2.7</b></p>	<p><b>Cement Manufacturing, Petroleum Refining, and Pulp and Paper</b> - The cement manufacturing, petroleum refining, and pulp and paper industrial source categories are already under substantial regulation, but continue to be significant sources of pollutants and warrant further consideration by EPA. EPA should evaluate potential national or regional emissions reduction strategies for criteria pollutants and air toxics in these categories. This should include improving emissions inventories if necessary and assessing their impacts on nonattainment areas or other sensitive areas. EPA should carefully consider the cost-effectiveness of imposing additional controls as it determines whether additional emissions reductions are justified and should take action consistent with the results of this analysis.</p>	<p><b>Medium</b></p>
<p><b>2.8</b></p>	<p><b>Residential Fossil Fuel Combustion</b> - EPA should evaluate the potential for expanding the Energy Star voluntary program to gain additional criteria pollutant emissions reductions (as well as improve energy efficiency) from the residential fossil fuel sector. As part of this effort, EPA should continue to gather information on the characteristics of residential fossil fuel emissions and their contributions to nonattainment, and the magnitude and cost of potential emissions reductions under a voluntary program and/or expanded use of low-sulfur fuel. EPA should also coordinate with Regional Planning Organizations (RPOs) and companies that produce lower-emitting appliances to assess the potential for programs that promote the installation of such technologies.</p>	<p><b>Medium</b></p>

<p><b>2.9</b></p>	<p><b>Guidance for Local Control Measures in Key Sectors</b> - EPA, in conjunction with S/L/T and affected stakeholders, should prepare guidance for local (urban-scale) control measures to support the upcoming round of ozone and PM<sub>2.5</sub> SIPs, and, if possible, optimize multipollutant control benefits and opportunities for reducing criteria and toxic air pollutants.</p>	<p><b>High</b></p>
<p><b>2.10</b></p>	<p><b>Residential Wood Smoke</b> - EPA should further develop the Residential Wood Smoke Reduction Initiative that includes working with S/L/T, industry, non-governmental organizations and others to support and facilitate the changeout of dirty, inefficient, “conventional” (pre-New Source Performance Standard or NSPS) woodstoves with new, cleaner, and more efficient heating appliances (e.g., EPA certified woodstoves). Concurrent with the development and implementation of changeout programs, EPA should commence efforts to revise the NSPS.</p>	<p><b>High</b></p>
<p><b>2.11</b></p>	<p><b>Open Burning</b> - EPA should work S/L/T to encourage more vigorous control of open burning, especially in, and adjacent to, counties with Class I areas and counties classified as nonattainment for fine particles or ozone.</p>	<p><b>Medium</b></p>
<p><b>2.12</b></p>	<p><b>High-Emitting Gasoline Vehicles</b> - EPA and S/L/T should reduce emissions from high-emitting gasoline vehicles that are believed to contribute a high fraction of mobile source emissions.</p>	<p><b>Variable</b></p>
<p><b>2.13</b></p>	<p><b>Conformity</b> - Conformity should be retained as part of the nation’s AQM system.</p>	<p><b>Low</b></p>
<p><b>NRC 3: Transform the SIP process</b></p>		
<p><b>Number</b></p>	<p><b>Recommendation</b></p>	<p><b>Priority</b></p>
<p><b>3.1</b></p>	<p><b>Align SIP Submittal Dates</b> - Because ozone, PM<sub>2.5</sub>, and regional haze SIPs have similar elements and are likely to contain similar control strategies, EPA, S/L/T and other stakeholders should strive to align the submittal dates of the three SIPs. This recommendation is not intended to suggest changes to any deadlines for attainment or implementation of control strategies, or to imply that a single SIP should be required for ozone, PM<sub>2.5</sub>, and regional haze. It is further recommended that, in the future, EPA should align designation dates as appropriate to promote multipollutant SIP development.</p>	<p><b>High</b></p>

<p><b>3.2</b></p>	<p><b>Protocol for SIP Development</b> - Each State should work with the appropriate EPA Regional Office to develop and implement a protocol for SIP development and processing that would lay out responsibilities, expectations, and timelines for all parties. While a model protocol should be developed, the EPA Regional Office and each State should have the flexibility to design a protocol tailored to their specific needs.</p>	<p><b>High</b></p>
<p><b>3.3</b></p>	<p><b>Clearinghouse of Approved SIPs</b> - EPA should develop a website, similar to the Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) clearinghouse, containing interpretations of rules and other SIP/TIP approval-related issues. This website could contain both policy and/or technical information depending on how it is developed. Each EPA Regional Office should develop a website, to be updated every 12 months on or about October 1, that identifies and provides links to all statutory and regulatory requirements in the federally approved SIP, including associated State and federal legal citations and effective dates.</p>	<p><b>Medium</b></p>
<p><b>3.4</b></p>	<p><b>Streamline Minor SIP Revisions</b> - For the SIP approval/disapproval phase of the air quality management process, EPA should establish a <i>de minimis</i> level for SIP revisions and streamline the processing of these revisions by the use of “letter approvals” or similar expedited procedures signed by the Regional Administrator. EPA should, in consultation with S/L/T and other stakeholders, develop a listing of the types of SIP actions that are eligible for streamlined processing.</p>	<p><b>High</b></p>
<p><b>3.5</b></p>	<p><b>Timely EPA Guidance</b> - EPA guidance should be issued in sufficient time for States to meet their SIP development deadlines. EPA should involve S/L/T and other appropriate parties in its guidance development process. In cases where guidance is delayed, EPA should take into consideration States’ efforts to meet deadlines without the benefit of the appropriate policy guidance.</p>	<p><b>High</b></p>
<p><b>3.6</b></p>	<p><b>Avoid Unnecessary Public Hearings</b> - EPA should work with States and Tribes to develop a model regulation that would require a public hearing for SIP revisions only if one is requested after public notice. This recommendation is not to restrict public comment in any way; it is meant only to eliminate those hearings that no one attends.</p>	<p><b>High</b></p>

<p><b>3.7</b></p>	<p><b>Facilitate Redesignation Process for Certain Areas</b> - For those areas that have not pursued and been granted redesignation when initially eligible, and have continued to demonstrate violation-free ambient air quality data for several years, EPA should expedite the redesignation process. EPA should ensure that all Regions and States are aware of the simplified procedures. This recommendation is not intended to change the requirements for redesignation under the CAA.</p>	<p><b>Low</b></p>
<p><b>3.8</b></p>	<p><b>Effective Communication with Constituencies</b> - EPA, along with S/L/T should develop a menu of options for effective communication to build support with a wide variety of constituencies for clean air plans at the S/L/T level.</p>	<p><b>Medium</b></p>
<p><b>3.9</b></p>	<p><b>Co-Benefits of Innovative Measures</b> - EPA and S/L/T should work collectively to communicate the co-benefits associated with innovative measures.</p>	<p><b>High</b></p>
<p><b>3.10</b></p>	<p><b>Innovative and Voluntary Measures</b> - EPA should encourage States' and Tribes' efforts to implement innovative measures by providing enhanced flexibility, SIP/TIP credit guidance, technical support, and funding for innovative and voluntary programs.</p>	<p><b>High</b></p>
<p><b>3.11</b></p>	<p><b>SIP Credits for Bundled Innovative Measures</b> - EPA should incentivize innovative pollution control strategies by offering SIP/TIP credit for "bundled and discounted" measures.</p>	<p><b>High</b></p>
<p><b>3.12</b></p>	<p><b>Regional Approaches to SIP Planning</b> - For many areas, planning for new SIPs or major revisions to existing SIPs for two or more separate nonattainment areas that are both part of the same regional-scale air quality problem should be coordinated. If requested by a State, EPA should work with the different nonattainment areas, Tribes and combinations of multistate organizations and other stakeholders, as appropriate, to assist in the development of regional approaches to planning. This could include technical assistance such as modeling, national or regional control strategies, model SIPs, and model rules as templates for S/L/T adoption.</p>	<p><b>High</b></p>

<p><b>3.13</b></p>	<p><b>Federal and State Partnership</b> - EPA should participate with S/L/T in the SIP/TIP development process to identify and pursue emissions reductions from important source categories, especially those that only the federal government has the ability to address, such as federal and international sources. The level of control sought from these sources should be commensurate with their impact on the nonattainment area. As warranted by the nature of the source, control strategy development should be carried out by S/L/T working either directly with EPA or with EPA and other federal agencies. For attainment demonstration purposes, States should be able to take appropriate credit for anticipated reductions from these sources (whether the reductions are from regulatory or incentive programs) so long as the control strategy and its anticipated impact are found to be consistent with EPA regulation and guidance.</p>	<p><b>High</b></p>
<p><b>3.14</b></p>	<p><b>Weight-of-Evidence Demonstrations</b> - In order to move beyond the current approach of relying on air quality modeling, EPA, in conjunction with S/L/T and affected stakeholders, should modify its guidance to promote weight-of-evidence (WOE) demonstrations for both planning and implementation efforts. In particular, these demonstrations should reduce reliance on modeling data as the centerpiece for SIP/TIP planning, and should increase use of monitoring data and analyses of monitoring data, especially for tracking progress.</p>	<p><b>High</b></p>
<p><b>3.15</b></p>	<p><b>Periodic Assessments to Track Progress</b> - S/L/T and EPA should conduct periodic assessments to ensure that areas are on track to meet NAAQS, air toxics, and visibility goals, and make mid-course adjustments, as necessary.</p>	<p><b>High</b></p>
<p><b>3.16</b></p>	<p><b>Averaging, Banking and Trading in Gasoline Sulfur Program</b> - EPA should evaluate the averaging, banking, and trading (ABT) provisions included in the Tier II gasoline sulfur regulation to see if they are effective.</p>	<p><b>Low</b></p>
<p><b>NRC 4: Develop an integrated program for criteria pollutants and hazardous air pollutants</b></p>		
<p><b>Number</b></p>	<p><b>Recommendation</b></p>	<p><b>Priority</b></p>
<p><b>4.1</b></p>	<p><b>SIPs to Address Multipollutant Impacts</b> - For the SIPs States are required to submit over the next several years, EPA and S/L/T should promote the consideration of multipollutant impacts, including the impacts of air toxics, and where there is discretion, select regulatory approaches that maximize benefits from controlling key air toxics, as well as ozone, PM<sub>2.5</sub>, and regional haze.</p>	<p><b>High</b></p>

<b>4.2</b>	<b>Multipollutant Benefits and Disbenefits in Standards Setting -</b> EPA should explicitly outline and quantify multipollutant benefits and disbenefits when setting emissions standards.	<b>High</b>
<b>4.3</b>	<b>Greenhouse Gas Co-benefits and Disbenefits -</b> EPA should assist States and localities in quantifying the potential for greenhouse gas co-benefits and disbenefits of emissions reduction measures primarily designed to address ozone, PM <sub>2.5</sub> , regional haze and air toxics.	<b>High</b>
<b>NRC 5: Enhance protection of ecosystems and public welfare</b>		
<b>Number</b>	<b>Recommendation</b>	<b>Priority</b>
<b>5.1</b>	<b>Program Review to Improve Ecosystem Protection -</b> EPA should, in parallel with recommended scientific and technical work, begin now to examine current and alternative clean air related policies and programs to develop approaches that would advance protection of ecosystems from the adverse effects of air pollution. Alternatives that should be evaluated include a regional cap-and-trade program, protection of ecosystems based on critical loads, a State-wide planning program for protecting and enhancing air quality in areas that attain the NAAQS (including National Parks and Wilderness Areas).	<b>High</b>

## Recommendations: Background Papers

**1.1 Emissions Measurements and Reporting:** *EPA, in conjunction with S/L/T and affected stakeholders, should pursue improved emissions measurements and reporting to enhance emissions databases for more accurate air quality assessments and tracking of progress.*

**Background/Explanation:** Recent studies have noted many deficiencies with current emissions inventories (e.g., “Improving Emission Inventories for Effective Air Quality Management Across North America: A NARSTO Assessment,” September 30, 2004). The NARSTO report, as well as the NRC recommendations, notes the benefits of collecting actual emissions data using emissions measurement techniques, such as the continuous emissions monitors (CEMS) for electrical generating units (EGUs) mandated by Title IV of the Clean Air Act. Improved emissions inventories are needed to provide for more effective control strategy planning and to meet future air quality management challenges.

**Recommended Actions:** A strong national effort is needed to require emissions measurements and reporting for as many major source categories as possible. The primary objective of these measurements is to produce accurate emissions data for supporting control strategy planning and tracking progress. The Work Group recommends that this can best be accomplished by the following actions:

- 1) EPA should conduct a study to identify:
  - a) relevant existing emission measurement methodologies for criteria pollutants (and their precursors) and hazardous air pollutants (HAPs), source categories for which these methodologies can be applied, and protocols for conducting these measurements,
  - b) efforts needed to develop new emission measurement methodologies and technologies for other source categories (especially, those for which current emission estimates are highly uncertainty), and
  - c) costs to conduct emission measurements.

Emissions measurement methodologies that should be considered include CEMs (which, as noted above, are already required by Title IV for EGUs, by the OTC’s NO<sub>x</sub> Trading Program for several source categories, including industrial boilers, turbines, and cement kilns, and by numerous NESHAPS and NSPS); “random” stack testing (which may be appropriate for minor sources); and remote sensing.

- 2) EPA should evaluate the need for and appropriateness of regulations to require emissions measurements for as many source categories as possible. As necessary, EPA should undertake rulemaking as soon as possible.
- 3) EPA should evaluate the need for and appropriateness of regulations to require reporting of emissions measurements to a user-friendly central data base, similar to EPA’s Acid Rain database for EGUs. This would satisfy the compliance reporting requirements of Title V and place the information in a location where all entities could have access to it promptly. As necessary, EPA should undertake rulemaking as soon as possible.

**Benefits:** Collecting actual emissions data will reduce uncertainty in emissions inventories, enhance ability to participate in emissions trading programs, support air quality modeling, and increase certainty for compliance purposes. These data are also important to the success of most of the other Work Group recommendations. Making these data available through a central database will allow easier and more widespread access to the data.

**Feasibility:** This recommendation has a medium feasibility for implementation because it can be completed under existing statutory authority, but will require a study to identify the source categories and will take some time to implement.

**Timing:** The study can be performed in the next 6 – 9 months. The timeframe for establishing emissions monitoring requirements and for implementing these requirements could take several years.

**Resources:** The identification of source categories can be performed by EPA technical staff (or by a contractor for less than \$50K). The costs to conduct the emissions measurements (and report the data), however, are unknown, but are likely to be substantial.

**Priority Level:** High

**1.2 Emissions Factors and Estimation Methods:** *Where emissions measurement-based information is impractical to obtain for air quality assessments, or where improved projections are needed, EPA, in conjunction with S/L/T and affected stakeholders, should improve emissions factors and emission estimation methods.*

**Background/Explanation:** Recent studies have noted many deficiencies with current emissions inventories (e.g., “Improving Emission Inventories for Effective Air Quality Management Across North America: A NARSTO Assessment,” September 30, 2004). The NARSTO report, as well as the NRC recommendations, note numerous weaknesses with current emission estimates. Improved emissions inventories are needed to provide for more effective control strategy planning and to meet future air quality management challenges.

**Recommended Actions:** A strong, systematic national effort is needed to improve emission estimation methods for all major source categories, especially poorly characterized sources or those for which there is uncertainty in current emission estimates. The primary objective of these improvements is to produce better emissions inventories for supporting control strategy planning and tracking progress. The Work Group recommends that this can best be accomplished by the following actions:

- 1) EPA, in conjunction with S/L/T and affected stakeholders, should review existing emissions factors and consider the results of EPA’s recent emissions factor workshop (“Revamping the Emissions Factor Program – A Workshop,” August 25-26, 2004) to:
  - a) identify the most significant emissions factor needs,
  - b) recommend and prioritize data collection and steps necessary for improving emissions factors.

EPA should develop and implement procedures for quickly disseminating new emissions factors.

- 2) EPA, in conjunction with S/L/T and affected stakeholders, should review existing source profiles used in source-based (and receptor-based) modeling to:
  - a) identify the most significant source profile needs,
  - b) recommend and prioritize data collection and steps necessary for improving or developing source profiles for poorly characterized sources.
- 3) EPA, in conjunction with S/L/T and affected stakeholders, should conduct a study to reconcile current emissions inventories with ambient measurements. The study should build-upon the “top-down” evaluations summarized in the NARSTO emissions inventory assessment. Based on the study, EPA should work with S/L/T and affected stakeholders to improve emission estimates. Examples of emission estimation improvements include methods for mobile sources, ammonia sources (especially livestock operations, fertilizer applications, soil, and urban sources), and unusual or infrequent events (e.g., forest fires, dust storms, chemical spillage or upsets, unusually hot days).

**Benefits:** Developing improved emission estimation methods will allow States and local agencies with interest and resources to apply those methods to create inventories that are more accurate and hence more useful for purposes of air quality modeling platform development and validation, attainment planning, and progress tracking. The improved State and local inventories would also be incorporated into the National Emissions Inventory used by EPA in developing effective national or regional strategies. Some of the listed improvements in methods – those dealing with

non-point source categories – could also be applied directly by EPA in developing the National Emissions Inventory.

**Feasibility:** These recommendations have medium to high feasibility for implementation because they can be completed under existing regulatory authority. For some of the recommended actions, specific steps towards have already been taken and EPA is currently making further progress. However, later steps will require substantial resources above current efforts.

**Timing:** Most of the desired methods, models, and guidance documents will take several years to complete, even assuming resources are available.

**Resources:** The needed funding for this work is uncertain, but in the aggregate may likely exceed a few million dollars per year over several years.

**Priority Level:** High

**1.3 Uncertainty in Emissions Inventories and Modeling:** *EPA, in conjunction with S/L/T and affected stakeholders, should quantify and take actions to reduce uncertainty in emissions inventories and air quality modeling applications, provide guidance for incorporating uncertainty assessments into SIP planning, and improve communication of uncertainty to decision-makers.*

**Background/Explanation:** Technical analyses performed to support policy-making need to address complex and sometimes poorly understood problems. While serious attempts are made to rely on the best science available at the time, there are, generally, limitations with these analyses. For example, emissions inventories for some source categories are developed using emissions factors of variable quality. Another issue with these analyses is that they may reflect simplifications to facilitate communication with policy makers. For example, modeling analyses of a given control scenario will generate a single, best estimate, rather than dealing with the actual probability of success. An effort should be made to deal with the associated uncertainty in the technical analyses, especially with regard to emissions inventories and modeling applications. There is also uncertainty with monitoring data, but it can be better characterized.

**Recommended Actions:** The Work Group recommends the following actions to address uncertainty in existing emissions inventories and modeling analyses:

- 1) EPA, in conjunction with S/L/T and affected stakeholders, should conduct a study to:
  - a) evaluate sources of uncertainty in emissions inventories and modeling analyses for all sources,
  - b) identify needed data collection activities (and associated costs) to reduce the most significant emissions uncertainties,
  - c) identify appropriate methods for incorporating uncertainty in preparing emissions inventories, and
  - d) identify appropriate methods for incorporating uncertainty in conducting modeling analyses. Particular attention should be paid to probabilistic approaches in evaluating the likelihood of “success” (i.e., meeting the NAAQS) as part of the attainment demonstration.
- 2) EPA should provide guidance to S/L/T for incorporating uncertainty assessments in SIP planning. In addition, EPA, in conjunction with S/L/T and affected stakeholders, should improve communication of uncertainty to decision makers and the general public.

**Benefits:** Air quality management decisions are more likely to achieve intended goals at least cost if the decisionmakers have some information on the uncertainties in emissions estimates – and on the uncertainty in other estimates derived from them such as pollutant concentration estimates-versus having no such information. Public and industry acceptance may also be greater if it is known that uncertainties have been responsibly addressed. Also, knowledge of uncertainties can help target resources towards information collection that will have the largest payoff in terms of reducing bias and uncertainty in the emissions estimates, leading again to better air quality management decisions. Because real world experiences in using explicit uncertainty characterizations to make air quality management decisions are at best rare and narrow in scope, it is not yet possible to say by how much or in what specific areas the air quality management process is most likely to be affected.

**Feasibility:** Implementation of these recommended actions in the near term (i.e., next five years) will be difficult, given that there is so much source-by-source uncertainty characterization work to be done. The recommendations can be considered to have medium feasibility for the longer term, if resources are present, because they can be completed within existing statutory authorities.

**Resources:** Resource needs are uncertain, but may be high, if all important sources of uncertainty are to be characterized objectively, especially if this is attempted retroactively (e.g., to characterize the uncertainty of a “legacy” emission factor). Resources needs would be lower if well informed, but subjective expert opinion is considered sufficient. Also, resource needs will be less, if the need to characterize uncertainty is part of the original data objectives for development of new emissions factors, models, etc.

**Priority Level:** High

**1.4 Multipollutant Monitoring:** *EPA, in conjunction with S/L/T and affected stakeholders, should promote and improve integrated, multipollutant monitoring.*

**Background/Explanation:** Ambient monitoring data are an essential part of the nation's air quality program. Monitoring objectives include determining compliance with federal air quality standards, developing emission control plans, tracking effectiveness of these plans, and providing information for the public, regulators, and affected stakeholders on the quality of the air. Over the past 30 years, the air pollution situation has changed significantly, as control programs have reduced emissions of many pollutants and as science has identified emerging issues of concern. Accordingly, it is important that air monitoring efforts be dynamic and responsive to meet the current and future public, regulatory, and scientific needs.

**Recommended Actions:** The Work Group recommends the following actions to promote and improve monitoring:

- 1) EPA should finalize its proposed national ambient monitoring strategy, and S/L/T should, as appropriate, work together on a regional-scale to consider the need for, and, if appropriate develop, regional monitoring strategies. The existing monitoring networks are top-heavy on determining attainment/nonattainment and light on addressing other monitoring objectives, especially control strategy development and tracking progress. An assessment of the existing networks, either through a national or regional monitoring strategy, is needed to support redistribution of monitoring resources to address current policy- and program-relevant objectives. In the longer term, EPA should consider adopting a more inclusive and holistic national monitoring strategy which considers all types of monitoring pursuant to health and non-health (e.g., ecosystem) objectives.
- 2) As initial efforts in implementing the national monitoring strategy, EPA should:
  - a) Establish six Level I (research-grade) NCore sites with reasonable geographic coverage (e.g., one each in the NE, SE, MW, and S, and two in the W). Additionally, EPA should work with the Level I researchers to prepare and implement a data management and analysis plan. Funding for the operation and maintenance of these sites, and the data management and analysis work, should be provided by EPA (ORD). EPA should also sponsor a workshop every three years to report on the lessons learned and to promote technology transfer from the Level I sites.
  - b) Establish, in conjunction with S/L/T, the Level II (multipollutant) NCore sites. (The appropriate number and location of these sites should be determined by the S/L/T and the respective EPA Regional Offices.) Additionally, EPA should work with the S/L/T, to prepare and implement a data management and analysis plan. Any resource savings from network changes provided by a regional monitoring strategy should be directed to help pay for the operation and maintenance of these sites, and the data management and analysis work.
- 3) EPA should support research and development (for example, through the Level I NCore sites) to improve monitoring methods for:
  - a) PM<sub>2.5</sub>-mass: Establish a continuous federal equivalent method for PM<sub>2.5</sub>-mass (i.e., resolve difference between current filter-based FRM for PM<sub>2.5</sub>-mass and continuous PM<sub>2.5</sub>-mass methods).
  - b) PM<sub>2.5</sub>-species: Establish a consistent filter-based method for measuring and reporting OC and EC (i.e., adopt the IMPROVE methodology for both rural and urban

- measurements), identify appropriate measurement methods for supporting source apportionment studies for OC, and establish reliable continuous methods for individual PM<sub>2.5</sub> species. EPA should recognize and report the uncertainty in these measurements.
- c) PM<sub>2.5</sub> & PM<sub>10</sub>: Investigate the potential for over-sampling with the PM<sub>10</sub> and PM<sub>2.5</sub> FRM samplers in areas where the mass median diameter (MMD) of the PM is larger than the size of interest (10 or 2.5 AED) and determine whether additional research, altered inlets, or implementation guidance should be provided.
  - d) PM-coarse (PM<sub>c</sub>): Establish a federal reference method for PM<sub>c</sub>. Using the difference between PM<sub>10</sub> and PM<sub>2.5</sub> as measured with PM<sub>10</sub> and PM<sub>2.5</sub> FRM samplers is not acceptable. The method should be capable of determining the amount of crustal material.
  - e) Air Toxics: Need reliable methods for acrolein, hexavalent chromium, and other species. A portion (e.g., 10 percent) of federal funding for the national air toxics monitoring program should be used for methods development.
  - f) Dry deposition measurements, particularly for mercury species (see Recommendation 1.5).
- 4) EPA should promote policies to avoid disincentives for monitoring. The necessary changes in ambient monitoring networks, as called for by the national and regional monitoring strategies, should proceed without any negative ramifications. Specific actions include:
- a) Support concept of performance-based measurement systems (PBMS) in EPA's national monitoring strategy (i.e., monitoring intended for investigative, not compliance, purposes). Although these measurements should meet minimum data quality requirements (developed through the Data Quality Objectives process), these data will not be used to assess attainment or nonattainment with the NAAQS. Note, this concept is similar to the FACA recommendation to "decouple the use of research data for regulatory purposes for a period of several years." Prior to deploying PBMS (including untested, research-grade monitors), states and the EPA regional office should document in writing the non-compliance monitoring objectives and the appropriate response to any measured values in excess of the level of the NAAQS (e.g., deployment of an FRM monitor).
  - b) Acknowledge EPA's Exceptional Events policy, which avoids counting (for compliance purposes) high pollution events due to certain unusual or extreme conditions.
  - c) Avoid monitors taking "root" by having state and local agencies specify monitoring objectives for their existing networks (including the expected period of sampling to meet these objectives) in their regional monitoring strategy. For any new monitoring, encourage identification of the monitoring objectives up-front (including expected period of sampling to meet objectives). Provide the agencies with discretion in moving monitors upon completion of the intended sampling period.
  - d) Promote the concept of sharing monitoring data in a timely manner with potential sources as a means to help identify and minimize pollution problems rather than a strict enforcement tool. This would require the expansion of real-time monitoring and data transfer capabilities at existing and new monitoring sites. This effort and the

resulting data could be utilized, with appropriate input on potential pollution emission activities and sources, for targeting more cost-effective control strategies.

- 5) EPA should, whenever possible, promote co-location of atmospheric dry and wet deposition monitoring with long-term monitoring of ecological conditions (see Recommendation 1.5).

**Benefits:** Implementation of the national monitoring strategy will demonstrate EPA's commitment to a multipollutant air quality management framework, given that the developing a measurements infrastructure is a critical component upon which further technical and program adjustments can be based. From a strict technical perspective, the national monitoring strategy will broaden the scope of monitoring services beyond the historical regulatory emphasis and allow for more credible program accountability assessments, air quality model evaluation, support to forecasting venues such as AIRNow, and enhanced support to the research community, especially in the health effects area. Support for Level I sites would demonstrate EPA leadership in bridging the gap between research and applications and engaging the nation's scientific expertise directly into its air program infrastructure.

**Feasibility:** Implementation of the national monitoring strategy is underway and most components of the Level II NCore sites should be implemented within current resource allocations. There are no currently identified resources for the Level I sites. Failure to fund these sites will jeopardize successful implementation of the strategy.

**Timing:** EPA could finalize the national monitoring strategy, and S/L/T could work together and prepare regional monitoring strategies during CY2005. Assuming the availability of funding, EPA could establish these sites in CY2006. EPA's national strategy implementation plan targets a phased implementation of the NCore Level II sites in 2007.

**Resources:** A minimum base of \$3M per year would be needed to fund basic operations for six Level I sites. EPA's national strategy implementation plan recommends an outlay of \$10M per year (OAR or ORD) to support these sites. Internal OAQPS funding of approximately \$150K/year for FY05 and FY06 is estimated to be needed to support training needs associated with implementing the strategy.

**Priority Level:** High

**1.5 Framework for Accountability:** *EPA, in conjunction with atmospheric scientists, health and ecosystem experts, S/L/T, and affected stakeholders, should undertake a systematic effort to track air quality achievements and evaluate air program results. This effort should begin by focusing on the progression and associations of air emissions as they interact and ultimately affect human health and the environment. In order to move beyond the current approach of relying predominately on air quality measurements, we need to further develop and apply the capacity to monitor, assess, and report on how changes in emissions impact air quality, atmospheric deposition, exposure, and effects on human health and ecosystems. Emphasis should be placed on developing and enhancing appropriate health and ecosystem indicators, benchmarks, and subsequent analyses within this overarching accountability framework.*

**Background/Explanation:** To guide future improvement of the air quality management system, the NRC identified as a longer-term objective the need for a results-oriented approach which emphasizes “performance rather than the process” in determining the efficacy of air policies and programs. Building on the current paradigm of accountability, EPA could better track, assess, and communicate significant results of emission control programs, including changes in source/emissions, air quality/atmospheric deposition, exposures, and effects. Emphasis is placed on systematically measuring progress and assessing benefits of air quality management through enhancing and expanding the suite of benchmarks and indicators of health and ecological outcomes. It is important to recognize that public health and ecosystem responses to emissions reductions occur over time and not always in the same time context as program assessments. The plan would, in a very general fashion, be based on the framework described above. That is, ideally accountability efforts would follow the “source/emissions – to air quality – to exposure – to dose – to effect” paradigm producing an improved understanding of cause/effect associations and input for meaningful program changes (or mid-course adjustments). It may be impossible to establish these links for health or ecosystem effects following strictly this linear progression. Plans for accountability will need to grapple with the difficult issue of tracking what are often small changes in health effects, on a relative basis, in large populations.

**Recommended Actions:** The Work Group recommends a 3-part approach involving health effects, ecosystem effects, and SIP planning for systematically ensuring that air policies and programs are achieving intended results.

For public health, the Work Group recommends that EPA work with health effects experts (e.g., federal agencies under the CENR Air Quality Research Subcommittee, CASAC/NAS, State/CDC/EPA environmental public health tracking partners, and HEI) to develop measures to define and assess human health impacts of air pollution and by developing ways to track and evaluate progress in reducing those impacts. Specific actions include:

- 1) Strengthen the partnership among atmospheric science, health research, and program accountability efforts.
  - a) Produce a summary report on air quality and health accountability as a first assessment of findings/capability
  - b) Sponsor a collaborative workshop to promote involvement in developing the overarching framework.
- 2) Expand on-going efforts into public health and air quality accountability.
  - a) Assign a specific group to focus on public health and air quality accountability.

- b) Study effects of AQI advisories on exposure-reduction behaviors and whether behaviors lead to health benefits.
  - c) Fund grants to State/local health departments in collaboration with State/local environmental agencies to assess health impact of specific environmental regulations/actions and whether they align with projected health impacts.
  - d) Develop methodologies to detect changes in human health indicators/responses, as a result of changing from meeting 1-hr ozone standard to meeting a more stringent 8-hr ozone standard.
  - e) Develop methods and collect data to better assess population exposure to air pollutants of ambient origin, considering indoor exposure and variables impacting personal exposure (time spent indoors, exercising, etc.).
  - f) Enhance exposure assessment activities through expanded collection of air pollution biomarker data and development of additional biomarker detection methods for priority air pollutants.
  - g) Develop further epidemiological and biostatistical approaches in assessment of exposure and dose, selection of health outcomes, and study design and data analysis.
  - h) Review/critique the PHASE project (this winter), learn from PHASE and expand indicators work, and consider expanding PHASE into a functional air quality-public health tracking program.
  - i) Identify additional projects, additional research, and explore further: building tools and develop methods for making air quality-public health linkage, expanding the NATA connection to criteria pollutant analyses, building on NATA and Criteria Document preparation to develop indicators and protocols, and ensuring appropriateness of ambient and health monitoring systems for public health tracking.
- 3) Undertake specific accountability efforts.
- a) Undertake “intervention” studies for cities with largest expected, overall air quality improvements.
  - b) Examine the usefulness and implementation of accountability measures in the context of “natural” experiments.
  - c) Design and implement a study of accountability measures for changes in multiple air compositions.
  - d) Study health indicators for ozone and particle air quality in areas with contemporary improvements.
  - e) Study particle and CO effects in areas with winter time programs to reduce pollution from wood stoves.
  - f) Develop processes to identify and implement accountability research for health effects resulting from long term air quality improvement trends. Methodologies may need to be developed to account for life-style and other interferences.
  - g) Develop/improve biological indicators or biomarkers of early effects for long-term and acute exposures.

For ecosystems, the Work Group recommends that EPA work with others to develop benchmarks and measures to assess ecological impacts of air pollution, and improve ways to track and evaluate progress in reducing those impacts. Specific actions include:

- 4) Improve tracking and evaluation of the effects of multiple air pollutants on aquatic and terrestrial ecosystems to assess the response to air pollution control policies.
  - a) Identify a comprehensive suite of air quality—ecosystem indicators or measurements for tracking status and trends in exposure and condition consistently across broad regions of the U.S.
  - b) Increase the density and spatial coverage of long-term ambient air quality and atmospheric deposition monitoring stations in rural, remote forest, agricultural, and coastal areas.
  - c) Co-locate long-term measurements of ambient air quality and atmospheric deposition with long-term ecological research studies to answer key policy questions over time and a range of scales.
- 5) Conduct and/or facilitate integrated assessments and research to develop and implement an appropriate suite of measurements for detecting ecosystem response to air pollution control programs within a long-term monitoring and assessment framework.
  - a) Improve methods for monitoring atmospheric inputs to ecosystems and ecosystem response. Consider developing routine methods for measuring ammonia, organic nitrogen, dry deposition of mercury, and various dry measurements in a network mode (e.g., NADP, CASTNET), including in under-represented areas, such as coastal and western ecosystems.
  - b) Improve methods to evaluate the status, trends, and response to air pollution control over regional scales, such as total nitrogen deposition rates and loadings, delivery of atmospheric loads to ecosystems relative to other sources, and simple, effective indicators of ecological condition.
  - c) Improve models for characterizing the transfer of air pollutants through water, soil, and food chains over time.
- 6) Collaborate with federal and State agencies, and the academic research community to pursue focused, integrated assessments and the integration of ecologically-relevant monitoring networks.
  - a) Identify and develop institutional arrangements to initiate focused air quality-ecosystem, integrated environmental assessments.
  - b) Identify and leverage existing models of successful collaboration in atmospheric, aquatic, and terrestrial environmental monitoring and assessment.
  - c) Standardize data collection activities across agencies, where possible, and look for ways to offer air-quality ecosystem datasets in centralized locations.
- 7) Examine the possibility of using critical loads and thresholds, and other environmental benchmarks to quantify impacts on ecosystems.
  - a) Initiate a series of focused technical workshops with stakeholder groups on the state-of-the-science to inform the development of environmental benchmarks or measures which define and assess the impacts of air pollution on ecosystems, and the expected time scales of recovery.
  - b) Synthesize the results of the workshops for possible EPA policy development consideration; begin to develop a framework or strategy for applying the scientific assessment information.

- c) Conduct air quality-ecosystem benchmark assessments (e.g. critical loads) to better characterize air to ecosystem effects.

Finally, the Work Group recommends that EPA work with S/L/T to determine appropriate metrics which should be used to more effectively track progress. Specific actions include:

- 8) For the major control programs in a given SIP, determine quantifiable metrics for characterizing the program (e.g., for the NO<sub>x</sub> SIP Call, the change in monthly or seasonal average NO<sub>x</sub> concentrations from rural/regional ambient monitors, and the monthly or seasonal average NO<sub>x</sub> emissions from power plants).
- 9) Determine emissions or ambient measurement methods (and measurement plan) for each metric (e.g., for the NO<sub>x</sub> SIP Call, a regional network of ambient NO<sub>x</sub> monitors and CEMs on power plants). Note, this may require enhancing or expanding emissions or ambient measurement activities, such as rural measurements for total reactive nitrogen (NO<sub>y</sub>), nitric acid and ammonia, and PM<sub>2.5</sub> speciation to better detect measurable progress of ozone and PM precursors in support of major national rules and in concert with Recommendation #1.4.

**Benefits:** A science-based framework to track and evaluate air quality achievements will enable EPA to allocate resources effectively. Shared data/information and joint prioritization of cooperative projects with other agencies allow resources to be used more effectively. Partnerships among the air quality community can support agency planning efforts, facilitate coordination activities, help to resolve issues between agencies, and improve involvement of non-federal organizations.

**Feasibility:** This recommendation is considered to be feasible given that models already exist for tracking program outcomes used throughout EPA, states, and by health and ecosystem experts. The likelihood this recommendation can be successfully implemented is enhanced by building on the existing “accountability” infrastructure under the current CAA authority, including health and ecosystem monitoring and assessment, and leveraging known effective models of collaboration.

**Timing:** Develop multi-year, high intensity indicators in years 1-3 that track effectiveness and progress of emission control programs in concert with the established framework. Indicator application is a complex process that will require additional time to further define ecosystem and health changes and expected time-scales of recovery.

**Resources:** EPA has a number of projects underway that support tracking and assessing the results of emission control programs. Several activities can build on these efforts and begin immediately with relatively little additional resources. Some of the recommended health and ecosystem actions entailing developing new metrics and performing integrated assessments, in particular, would necessitate additional staff resources and funds in OAR. Additional resources may be available and leveraged through collaboration with other EPA programs and non-EPA partners, such as states, non-governmental organizations, and industry.

**Priority Level:** High

**2.1 Industrial, Commercial, and Institutional Boilers:** *EPA should complete as soon as possible a review of the contributions from this category and the technical and economic feasibility of further controls, given the high priority assigned to this sector. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.*

**Background/Explanation:** Industrial, commercial, and institutional (ICI) boilers combust coal, oil or gas to produce heat and process steam in numerous sectors, including chemical manufacturing, petroleum refining, commercial buildings, hospitals, and universities. ICI boilers should be evaluated by EPA for possible regulation due to: 1) their significant contribution to projected 2010 criteria pollutant emissions; 2) the availability of cost-effective control measures; and 3) the likely contributions to nonattainment of the national ozone and fine particle standards as well as the other environmental impacts associated with boiler emissions.

**Recommended Actions:** To determine whether regulation of ICI boilers is warranted and to improve existing ICI boiler inventories and data, EPA should:

- 1) Evaluate the ICI boiler sector in detail using the agency's existing authorities under the Clean Air Act. EPA should identify which measures are likely to be cost-effective for specific boiler sizes and types and identify the total emissions reductions this would imply for the sector.
- 2) Close data gaps pertaining to characterization of the ICI boiler population and emissions, potentially by hiring a technical consultant to improve the quality and completeness of the ICI boiler inventory and to develop a realistic emissions baseline. The consultant would seek to integrate data from available data sources, including data in the NEI, data reported as a result of the Consolidated Emissions Reporting Rule, and data pulled together to support MACT regulation and the OTAG effort. The goal would be to create a comprehensive and systematic database listing key unit-level data for all states that is properly maintained and updated over time.
- 3) Support a mechanism for reporting emissions from ICI boilers, potentially by maintaining and fully implementing the Consolidated Emissions Reporting Rule or developing a new Information Collection Request.
- 4) Demonstrate the effect of reductions from ICI boilers on attainment (through air quality modeling or other means deemed appropriate) to ensure that any action proposed for this sector will help meet the desired air quality objective.
- 5) Develop improved, peer-reviewed estimates of the cost-effectiveness of the various emission reduction measures that might be used with ICI boilers. This effort should include estimates for a range of sizes and should reflect recent experiences with NO<sub>x</sub> and SO<sub>2</sub> control technologies in the ICI boiler and similar sectors (e.g., electric power sector).
- 6) Make a final determination regarding whether and/or how to regulate ICI boilers that includes consideration of the potential penetration of cost-effective control measures.
- 7) Issue regulations, if warranted, that are national or regional in scope due to the broad-based distribution of ICI boilers and the potential for emissions transport. Emissions trading should be utilized where appropriate due to the successes in using this approach in the NO<sub>x</sub> SIP Call and the ability of this source to use continuous emissions monitors (CEMs). Any regulation of this sector should include requirements for CEMs or other reliable emissions monitoring methods. EPA could also consider alternative regulatory

approaches for smaller ICI boilers, considering administrative and emissions measurement costs and other factors.

**Benefits:** Emissions reductions from the ICI boiler sector have the potential to achieve significant reductions in criteria pollutants nationwide. In 2010, ICI boilers are projected to account for over 16 percent (2.7 million tons) of total NO<sub>x</sub>, 16 percent (2.4 million tons) of total SO<sub>2</sub>, and 5 percent (0.3 million tons) of total PM<sub>2.5</sub> emissions nationwide.<sup>10</sup> The projected 2010 SO<sub>2</sub> and NO<sub>x</sub> emissions from ICI boilers are second only to the projected emissions from the power sector (without CAIR). Emissions of NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>2.5</sub> contribute to an array of environmental problems, including ground level ozone, acid rain, fine particle pollution, eutrophication and regional haze. Reducing emissions from ICI boilers could therefore contribute to reducing the impacts of these emissions on human health. A comparison of projected emissions from ICI boilers and nonattainment areas also suggests a potential relationship between regulation of ICI boilers and improving local air quality. In fact, ICI boilers are expected to represent a sizeable share of emissions in many States that are projected to have one or more counties in nonattainment for the 8-hour ozone and fine particle standards in 2010.

ICI boilers are a potentially cost-effective source for additional emission reductions. Preliminary data indicate that control technologies for industrial boilers can achieve emissions reductions cost-effectively—often well below current allowance prices for NO<sub>x</sub> and SO<sub>2</sub>, and in many cases, below the levels deemed to be “highly cost-effective” under the proposed CAIR rule for the electric power sector (\$1,300 per ton of NO<sub>x</sub> and \$700 per ton of SO<sub>2</sub> in 2010).<sup>11</sup>

**Feasibility:** There do not appear to be any major technical or legal barriers to the proposed analyses or other measures to close information gaps. In addition, if regulation of ICI boilers is deemed appropriate, we do not see any barriers because authorities exist under Sections 110, 111, and potentially other sections of the Clean Air Act. The main hurdle is anticipated to be the likelihood of industry lobbying and legal action. This can be mitigated in part by providing a reasonable horizon within the framework of the fine particle and ozone attainment deadlines and by offering as much compliance flexibility as possible through emissions trading or other means.

**Timing:** Implementation of an emissions reduction program would need to take place no later than the 2010 to 2012 timeframe to help States meet attainment for ozone and fine particle national ambient air quality standards.<sup>12</sup> Consequently, the suggested improvements to the data and rule development should begin as soon as possible to give the industry a long lead time for compliance, if regulation is deemed appropriate.

**Resources:** EPA staff time would be required to develop peer-reviewed cost-effectiveness estimates, study the effects of ICI boiler control on attainment, and oversee the database development consultant. Funds would also need to be set aside to compensate the consultant. If

<sup>10</sup> Note that these percentages assume only existing regulations—they do not assume implementation of the proposed Clean Air Interstate Rule (CAIR) that would control emissions from the power sector. If implementation of CAIR were assumed, industrial, commercial and institutional boilers would constitute an even greater share of 2010 emissions. For example, with implementation of CAIR, the ICI boiler share of 2010 SO<sub>2</sub> emissions would be expected to increase to 22%.

<sup>11</sup> It should be noted that EPA did not assume reductions from ICI boilers in the CAIR because they did not believe there was sufficient information to determine that controls met the highly cost effective criteria.

<sup>12</sup> Attainment deadlines are as early as 2007 in some cases. In most cases, the NAAQS compliance deadline is April 15, 2009. However, extensions may be granted through April 15, 2014 or even April 15, 2016, if the required showings are made. The limited number of areas designated “severe” for the 8-hour ozone standard have even longer to meet attainment. States will need to know whether national/regional measures are going to be successful several years before the final deadlines so that they can ramp up additional programs of their own, where needed.

national or regional regulation is deemed to be appropriate, EPA staff time would be needed to develop proposed and final rules and design the trading program infrastructure or other regulatory approach. The State role would be limited to monitoring and source permitting.

The cost of implementation would depend on the type of regulation used and the number of sources covered. For example, the cost of administering an emissions trading program would be generally lower than a command-and-control approach. In addition, costs would be expected to increase somewhat if all ICI boilers are included versus those accounting for the majority of pollutants or those exceeding a boiler size or throughput threshold.

**Priority Level:** High

**2.2 Industrial Surface Coatings:** *EPA should complete as soon as possible a review of the contributions from this category and the technical and economic feasibility of further controls. EPA should then initiate development of a regional or national emissions control regulation for the category, or take alternative action consistent with the results of its analysis.*

**Background/Explanation:** VOCs from industrial surface coating represent about 11% of national VOC emissions. Reductions beyond current Control Techniques Guidelines (CTG) recommendations and New Source Performance Standards have been demonstrated and achieved by sources in all previously regulated industrial surface coating categories. While scheduled area source, residual risk rules, and 112(d)(6) review may result in further emissions reductions in this sector, there may still be significant emissions from facility maintenance operations and surface coating of miscellaneous wood products that have not been regulated previously. There exist two primary approaches for addressing these emissions – the use of low-VOC/low-HAP coatings, and the use of capture and control equipment.

**Recommended Actions:** EPA should: (1) review nonattainment contributions from this category; (2) assess the technical and economic feasibility of a more stringent performance standard and revised CTGs; and (3) proceed with the appropriate action(s) based on this review and analysis.

**Feasibility:** It would probably require 2 to 3 years to develop a new standard for this category. Resources would be devoted to review and analysis, necessary data collection and rule development.

**Timing:** Any regulatory effort would take 2 to 3 years at a minimum. However, updates to existing CTGs could be completed in shorter timeframe.

**Resources:** EPA resources would be required to undertake the required research and possible promulgation of a new NSPS, and also for the development of relevant CTGs. At the local level, resources associated with the adoption and enforcement of CTGs would potentially be required.

**Priority Level:** Medium

**2.3 Non-industrial Solvents:** *EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., a national rule) for this category using the VOC content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.*

**Background/Explanation:** Non-industrial solvents are projected to be responsible for 16% of nationwide VOC emissions in 2010. NIS/CCP are specifically subject to Section 183(e) with regard to VOC emissions. There is an existing national rule (40 CFR 59 subpart C) that regulates 24 categories of household consumer products. In addition, there are Control Techniques Guidelines (CTG) and alternative control techniques documents pertaining to categories such as cutback asphalt paving and agricultural pesticide application. The non-industrial nature of the products generally removes many of them from the authority of sections 111 and 112. There is no known authority to directly regulate HAP emissions from the use of consumer products.

The existing federal consumer products rule regulates only 25 categories of products. This rule is estimated to have reduced VOC emissions from these categories of household and institutional products by approximately 20 percent, or 90,000 tons per year nationwide, from a 1990 baseline. These reductions were achieved at a cost effectiveness of about \$250/ton. California and several other States have regulated, or are in the process of regulating, many more categories of products, and at lower VOC limits than the federal rule requires. As discussed above, several northeast States have been developing rules based on an Ozone Transport Commission (OTC) model rule for consumer products. The basis for the OTC model rule was the existing California rule.

It is possible that further regulation might not result in appreciable reductions. The reason for this is that most consumer products are manufactured and distributed nationwide, and that the major manufacturers formulate their products to be distributed nationwide. Accordingly, nationally distributed products must meet the most stringent requirements. This results in “compliant” products being distributed and used nationwide, even in areas with no regulations. However, smaller, regionally distributed products should be affected by further federal action. In proceeding with this recommendation, EPA should quantify the potential achievable emissions reductions associated with tightening VOC content limitations.

**Recommended Actions:** EPA should research the potential to gain additional VOC reductions from non-industrial solvents, focusing on:

- potential gains from regulation of additional product categories at the federal level and the of updating current standards;
- potential reductions from updating existing CTGs to reflect tighter State limits; and
- the extent to which regionally distributed products (from areas with no additional standards) contribute to total national VOC emissions and the magnitude of potential reductions from this group of products

Following its review, EPA should take regulatory action consistent with its analysis.

**Feasibility:** Further regulation of consumer products beyond the existing federal rule is possible and has been pursued by California and by some of the northeast States using an Ozone Transport Commission model rule based on California’s rule.

**Timing:** Any regulatory effort would take 2 to 3 years at a minimum. However, updates to existing CTGs could be completed in shorter timeframe.

**Resources:** Either a regulatory action or a revised CTG would probably require less than 1 FTE and \$25K to \$100K per year per category on EPA's part, depending on how much work was performed in-house. At the local level, resources associated with the adoption and enforcement of CTGs will be required.

**Priority Level:** Medium

**2.4 Architectural Coatings:** *EPA should initiate rulemaking efforts to establish minimum performance standards (i.e., a national rule) for this category using the VOC content limitations contained in, and regulating the products covered by, the model rule developed by the Ozone Transport Commission.*

**Background/Explanation:** VOCs from architectural surface coating represent about 4% of national VOC emissions. While this sector is already regulated under the national VOC rule (183(e)), California has adopted a more stringent standard for VOC content and OTC States are adopting rules based on the California rules. These standards could be extended nationwide. There currently exist near-zero VOC content materials for some content categories (e.g., flat interior wall coatings).

**Recommended Actions:** Research the magnitude of potential reductions that could be gained beyond existing rules, and if significant reductions could be achieved cost-effectively, adopt a more stringent national VOC content standard for this sector.

**Feasibility:** Implementation of additional controls for this industrial sector is a realistic expectation. It would require revisiting the current VOC content standard in place under section 183(e). The existence of State standards that are well below the national standard and the development of extremely low-VOC content materials, suggest that this activity would be worthwhile.

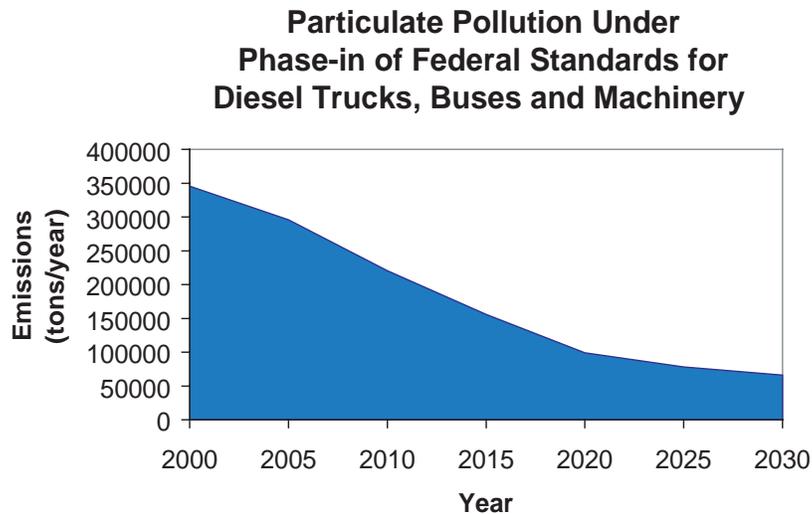
**Timing:** It would probably require 1-2 years to develop a new standard for this category. Resources would be devoted to necessary data collection and rule development.

**Resources:** EPA resources would be required to undertake the required research and rule development for further regulatory action.

**Priority Level:** Medium

**2.5 Heavy-Duty Diesel Engines:** *EPA should reduce emissions from the existing fleet of heavy-duty diesel engines by employing a multi-pronged approach.*

**Background/Explanation:** Over the last decade, EPA has moved aggressively to strengthen federal emission standards for a wide range of diesel engines. While these standards will serve to dramatically lower emissions when fully implemented, the full human health benefits will not be realized for 20 years or more. The figure below graphically shows the national particulate pollution under the phase-in of the federal emission standards for diesel trucks and buses, and nonroad engines.



**Figure 1.** National PM<sub>2.5</sub> emissions under phase-in of federal standards for on road diesel trucks and buses, and nonroad diesel equipment. (Estimated from EPA, 2000 and EPA, 2004a)

The delay in achieving emissions reductions is attributable to two factors. The first factor is the lapse in time before the emissions standards take effect for new engines. The standards finalized in 2001 for highway engines take effect in 2007, while the new standards for nonroad diesel engines are phased in based on engine size, beginning in 2008 with engines smaller than 25 hp. Final standards for nonroad engines greater than 750 hp will not be effective until 2015. The second factor that contributes to the lag in effectiveness of the diesel rules is the long lifespan of diesel engines. Under typical operating loads and levels of use, large diesel engines can last for more than one million miles and/or decades.

The ultimate consequence of the time lag in emissions reductions for diesel engines is a corresponding lag in achieving the projected health benefits. EPA has estimated that by 2030, the highway diesel rule will avoid 8,300 premature deaths per year, which otherwise would have been caused by exposure to particulate pollution from diesel emissions (EPA, 2000, Table VII-19). The rule is also projected to prevent more than 7,000 hospital admissions, 360,000 asthma attacks and more than 1.5 million lost work days in 2030 (EPA, 2000, Table VII-19). The nonroad rule similarly projects tremendous health benefits in 2030, including the avoidance of 12,000 premature deaths and 8,900 hospital admissions per year from particulate pollution exposure (EPA, 2004a, Table 9-11). The nonroad rule is also projected to avoid 200,000 cases of exacerbated asthma in children in 2030 (EPA, 2004a, Table 9-11). These projected health benefits in 2030 are extremely important. However, the fact is that the same kinds of health impacts that will be avoided in 2030 are occurring now, and will continue to occur until today's high-polluting diesel engines and equipment are replaced or cleaned up.

Policy action is needed to accelerate the transition to cleaner diesel engines and realize more immediate public health protection. In principle, emissions from these existing engines can be reduced either by incentivizing their early retirement, by improving their current emissions performance (e.g., by add-on emissions control system, changes in the engines themselves, repair of high-emitting engines or improved fuels), or by limiting the time that these engines operate (e.g., through idling reduction programs and/or otherwise). Each approach has merit under certain conditions and programs, and should be part of an implementation strategy. For example, centrally operated and fueled fleets (e.g., school and transit buses and refuse trucks) are good candidates for retrofit technologies or engine repowers. Some of these fleets can be excellent candidates for replacement with advanced technologies (e.g., hybrids) or alternative fuels. In addition, some mid-1990s engines can achieve lower emissions limits by reprogramming of engine control systems. Finally, programs aimed at reducing idling time can lower pollution, achieve substantial ancillary benefits from reduction of fuel consumption and greenhouse gas emissions, and lower operating costs.

**Recommended Actions:** EPA will continue to employ a variety of strategies to monitor and reduce emissions from the in-use fleet and enforce its emissions standards. These strategies are outlined below:

### **Heavy-Duty Compliance Programs**

- Continue to work with manufacturers to ensure compliance with existing and new emissions standards through manufacturer testing of new and in-use engines and effective EPA enforcement.
- Ensure that manufacturers of consent decree engines reprogram control systems to reduce NO<sub>x</sub> emissions.
- Develop, evaluate and provide guidance to the States on a heavy-duty vehicle testing approach that will be appropriate for use in heavy-duty vehicle inspection and maintenance (I/M) programs as a replacement for the existing snap-idle (smoke) test.
- Work closely with California Air Resources Board (CARB) to develop a harmonized, nationwide set of requirements for Heavy Duty On-Board Diagnostics (HD OBD) in the US for gas and diesel vehicles for implementation in 2010.
- Investigate the development of portable emission measuring equipment to quickly and accurately measure diesel particulate matter (PM) emissions.

### **Voluntary Programs**

- Develop a national initiative, building upon the success of EPA's voluntary programs, to provide federally funded incentives for diesel emissions reductions using California's Carl Moyer Program and Texas's Emissions Reduction Plan as models.
- Investigate low-interest loan programs and other creative financial methods to help private fleets retrofit or rebuild existing engines to reduce emissions.
- Work toward the goal of reducing the emissions of the existing 11 million engines in the fleet today by concentrating on the construction, port, freight and school bus sectors.
- Meet with States and engine manufacturers to develop a voluntary program that educates owners on ECM reflash strategies (to achieve NO<sub>x</sub> reductions) and urge their participation.
- Continue building industry support through voluntary, market-based approaches.

- Work with General Services Administration (GSA) and Department of Defense (DOD) to establish, by January 2006, government-wide procurement and contracting guidelines on emissions performance standards for existing diesel engines.
- Work with private and public fleets to develop operational strategies to reduce in-use emissions, such as idling reduction programs.

EPA should also consider a mandatory program that would:

- Dramatically expand current federal programs to cut pollution from existing diesel engines through accelerated retirements, retrofits, repowering, replacement and anti-idling measures. EPA should pursue a dual, complementary strategy to achieve the goal of retrofitting all heavy-duty diesel engines by 2012 by: (a) establishing mandatory measures to cut pollution from existing diesel engines and (b) considerably multiplying, through expanded congressional appropriations, the funding for both mandatory and voluntary programs with funding contributions from other federal agencies as well.

**Feasibility:** Continuation of the existing program is feasible; the compliance programs are operating under existing statutory authority and the voluntary efforts are currently partnering with States and fleet operators across the country. Legislation to secure expanded federal funding to sustain and enlarge voluntary programs to clean up existing diesel engines is also feasible, but would present a substantial challenge. The cost to retrofit all diesel engines would be high.

**Timing:** Several specific actions recommended here are currently a part of EPA's ongoing efforts. As noted above, EPA and CARB are working toward implementation of national HD OBD requirements in 2010. It is anticipated that other actions can be implemented in 3-4 years as current studies are completed and new testing technologies are established.

**Resources:** Continue existing efforts. Redirection of existing efforts/personnel may be required.

**Priority Level:** High

**References:**

EPA. 2000. *Regulatory Impact Analysis: Heavy Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements*, EPA420-R-00-026, December.

EPA. 2004a. *Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines*, EPA420-R-04-007, May.

EPA. 2004b. *Median Life, Annual Activity and Load Factor Values for Nonroad Engine Emissions Modeling*, EPA420-P-04-005, April.

## **2.6 Emissions from Ships, Locomotives, and Aircraft, and Mobile Source Air**

**Toxics:** *EPA should address emissions from ships, locomotives, and aircraft, and mobile source air toxics through national emissions standards.*

**Background/Explanation:** Over the past decade, EPA has adopted several groundbreaking rules that will dramatically reduce emissions from the nation's passenger vehicles, trucks and buses, and nonroad equipment. Collectively, these rules will eliminate tens of thousands of premature deaths and create tens of billions of dollars of health and other social benefits. Indeed, new engines covered by these regulations will be more than 90 percent cleaner than their predecessors.

As these vehicle sectors get progressively cleaner, thanks to vehicle turnover and an increased emphasis on retrofit and other strategies to reduce emissions from the existing fleets, EPA should address the growing percentage of emissions from engines outside the scope of these rulemakings i.e., from ships, locomotives and aircraft. Moreover, EPA should address mobile source air toxic emissions that have not been addressed by these rulemakings.

### **Regulating Additional Mobile Sources: Aircraft, Locomotive and Marine Diesel Engines**

While emissions from most categories of mobile and industrial sources have stabilized or decreased over the past two decades, emissions from locomotives, marine diesel engines and aircraft have increased, and are forecast to continue growing. For example, airplanes at U.S. airports emitted 350 million pounds of smog-forming pollutants in 1993, more than twice their 1970 total. The FAA estimates that aircraft-related NO<sub>x</sub> emissions will double by 2030. At the local level, an airport's arriving and departing planes can emit as much smog-forming pollution as many power plants and other large industrial sources.<sup>1</sup>

The situation at our nation's ports and rail yards is no different. Ships are projected to be the second largest source of mobile source PM emissions in 2020, emitting roughly one-fifth of the nation's soot particles,<sup>2</sup> thanks to the clean-up of highway and other nonroad diesel engines and the sharp projected growth in port activities. Locally, this growth will be even more significant—the Port of Los Angeles expects its trade-related traffic to triple by 2020.

Although these emissions can be significant local emission sources, States are largely preempted from regulating them through their SIP process or otherwise. Moreover, exhaust emission standards do not effectively address aggregate aircraft, ship or locomotive emissions on any given airport runway, at a crowded port or in a busy rail yard. Many of these sites are near residential neighborhoods, increasing the need for meaningful emission reduction strategies.

### **Regulating Additional Emissions: Mobile Source Air Toxics**

Mobile source air toxics (MSATs) are among the most pervasive and hazardous pollutants regulated by EPA. Indeed, EPA's National Air Toxics Assessment data show that MSATs exceed cancer health benchmarks in all areas of the country and are up to 10 times higher in urban areas. Mobile source programs such as Tier 2, highway diesel and nonroad diesel will significantly reduce mobile source air toxics. However, an analysis conducted by the Northeast States shows that nationwide, even with the full implementation of all mobile source programs, benzene, 1,3 butadiene, formaldehyde and other potent toxins will continue to exceed health risk benchmarks. EPA is required by CAA section 202(1) to reduce the threat posed by MSATs.

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<sup>1</sup> NRDC, *Flying Off Course: Environmental Impacts of America's Airports*, 1996, pp. 36-37.

<sup>2</sup> EPA, Nonroad Diesel Rule, Draft Regulatory Impact Analysis, EPA 420-R-03-008, April 2003, Section 3.2.

**Recommended Actions:** EPA should:

- 1) Promulgate technology-forcing Tier 2 emission standards for all new marine diesel engines, including compression-ignition marine engines at or above 30 liters per cylinder (Category 3 engines), that are more stringent than the international MARPOL Annex VI NO<sub>x</sub> limits. Section 213 of the Clean Air Act Amendments directs EPA to set nonroad standards that “achieve the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the engines or vehicles to which such standards apply.” Such standards should achieve emission reductions comparable to those required of other mobile source categories under EPA’s recent highway and nonroad diesel rules. These regulations should apply to all ships in U.S. ports, whether U.S. or foreign flagged.
- 2) Promulgate technology-forcing emission standards for new and rebuilt locomotive engines. Again, Section 213 of the Clean Air Act Amendments clearly authorizes EPA to do so. Such standards should achieve emission reductions comparable to those required of other mobile source categories under EPA’s recent highway and nonroad diesel rules.
- 3) Promulgate technology-forcing emission regulations for aircraft that are comparable in stringency to other mobile source emissions standards, while maintaining the aviation industry’s outstanding safety record. As with marine diesel engines, EPA is not limited by the ICAO process, and is authorized by Section 213 of the Clean Air Act to adopt such technology-forcing emission standards.
- 4) Develop strategies (including, to the extent permissible, permitting requirements and SIP control strategies) for reducing aviation, ship and locomotive emissions at airports, seaports and rail yards that can be employed at the State and/or Local level.
- 5) With respect to controlling ground-level aviation emissions within their SIP processes, EPA should encourage States and airport operators to consider strategies such as reduced engine idling and taxiing, differential landing fees, using gate-powered electricity rather than auxiliary power units, among others.
- 6) Provide guidance to States and airport operators so they consider emissions reduction strategies for ground service equipment as part of their SIP strategies. Such strategies could include accelerated retirement, engine repowers, emission control retrofits, reduced idling measures and replacements with the cleanest available engines and fuels, including alternative fuels.
- 7) Study toxic aircraft, ship and locomotive emissions and develop a strategy for reducing them. Studies have shown that these sources generate significant hazardous air pollutants, yet they are exempt from the Toxic Release Inventory (TRI) program.<sup>3</sup>
- 8) Dramatically expand the agency's programs to cut diesel PM from existing engines including both voluntary and mandatory measures.
- 9) Promulgate a protective national benzene cap. Expanding low-RVP gasoline requirements beyond ozone nonattainment areas would also lower benzene and other toxic VOCs and secondary toxics like formaldehyde and acetaldehyde.
- 10) Consider regulations to reduce other mobile source air toxics such as formaldehyde, acetaldehyde, acrolein and 1,3-butadiene.

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<sup>3</sup> See, e.g., <http://www.arb.ca.gov/diesel/documents/rrstudy/rcexecsum.pdf>.

- 11) Consider national gasoline standards that further reduce sulfur and also address other fuel parameters.
- 12) Address the high sulfur content in the distillate/bunker fuel used in Category 3 ocean-going marine vessels.
- 13) Consider requiring catalysts on nonroad gasoline engines such as forklifts.

**Feasibility:** High.

**Timing:** Current plans call for an NPRM on gasoline outboard, sterndrive, inboard and personal watercraft engines in the Spring of 2005; an NPRM on locomotive and marine diesel standards in mid-2005; an NPRM on air toxics in mid-2005; a final rule adopting the existing International Civil Aviation Organization NO<sub>x</sub> standards for aircraft engines in 2005; and a final rule on ocean-going marine diesel engines by mid-2007.

**Resources:** Several of the recommended actions have already been funded and staffed.

**Priority Level:** High

**2.7 Cement Manufacturing, Petroleum Refining, and Pulp and Paper:** *The cement manufacturing, petroleum refining, and pulp and paper industrial source categories are already under substantial regulation, but continue to be significant sources of pollutants and warrant further consideration by EPA. EPA should evaluate potential national or regional emissions reduction strategies for criteria pollutants and air toxics in these categories. This should include improving emissions inventories if necessary and assessing their impacts on nonattainment areas or other sensitive areas. EPA should carefully consider the cost-effectiveness of imposing additional controls as it determines whether additional emissions reductions are justified and should take action consistent with the results of this analysis.*

**Background/Explanation:** Cement plants, petroleum refineries, and pulp and paper mills are major emitters of criteria pollutants and hazardous air pollutants (HAPs). While boilers from refineries and pulp and paper mills would be considered under the ICI boiler recommendation, process sources associated with these two sectors present an additional challenge. It is much more difficult and costly to monitor and report emissions from process sources, such as catalytic cracking units, flares, and sources of fugitive emissions.

Petroleum refineries are major sources of HAPs and emit large quantities of criteria pollutants.

There are 146 petroleum refineries located in 33 States. However, fifty-five percent of the U.S. production capacity is located in three States - Texas, Louisiana, and California.

Based on EPA's projections for 2010, the cement industry in the U.S. will emit approximately 5 and 2 percent of the overall NO<sub>x</sub> and SO<sub>2</sub> emissions, respectively, excluding the emissions from EGUs. The sources of these emissions are about 200 active cement kilns in this country. Since cement industry was included under the NO<sub>x</sub> SIP Call rule, some of these kilns have already been retrofitted with NO<sub>x</sub> controls.

Pulp and paper mills are projected to be responsible for 2 percent of both nationwide PM<sub>2.5</sub> emissions and organic carbon emissions in 2010. The recent air toxics rules included a PM limit as a surrogate for metal HAPs, but PM<sub>2.5</sub> has not been specifically addressed.

**Recommended Actions:**

- 1) EPA should evaluate further potential national or regional emissions reduction strategies for criteria pollutants and HAPs in these categories. This should include improving emissions inventories and assessing their impacts on nonattainment areas or other sensitive areas.
- 2) EPA should carefully consider the cost-effectiveness of imposing additional controls as it determines whether additional emission reductions are justified.
- 3) EPA should and take action consistent with the results of its analysis of these sectors.

**Feasibility:** High, given apparent lack of technical or legal barriers to analysis and/or rule development.

**Timing:** This recommendation should be implemented in a timeframe that would allow for at least some emissions reductions to be achieved by 2010.

**Resources:** EPA staff time would be required to develop peer-reviewed cost-effectiveness estimates and study the effects of further control on these sectors on attainment. If national or

regional regulation is deemed to be appropriate, EPA staff time would be needed to develop proposed and final rules.

The cost of implementation will depend on the type of regulation used and the number of sources covered. For example, the cost of administering an emissions trading program is generally lower than a command-and-control approach.

**Priority Level:** Medium

**2.8 Residential Fossil Fuel Combustion:** *EPA should evaluate the potential for expanding the Energy Star voluntary program to gain additional criteria pollutant emissions reductions (as well as improve energy efficiency) from the residential fossil fuel sector. As part of this effort, EPA should continue to gather information on the characteristics of residential fossil fuel emissions and their contributions to non-attainment, and the magnitude and cost of potential emissions reductions under a voluntary program and/or expanded use of low-sulfur fuel. EPA should also coordinate with Regional Planning Organizations (RPOs) and companies that produce lower-emitting appliances to assess the potential for programs that promote the installation of such technologies.*

**Background/Explanation:** Residential fossil fuel use generally comprises natural gas, fuel oil, LPG and kerosene combustion for space heating, water heating, and cooking. This source releases emissions of several criteria pollutants, most significantly SO<sub>2</sub> and NO<sub>x</sub>. Geographically, emissions are more significant in the Northeast and Midwest. Opportunities for emissions reduction generally include actions or technologies that improve energy efficiency, such as high efficiency boilers, furnaces and water heaters, and insulation and air sealing, or energy-conserving behaviors (e.g., heating only rooms being used). Other emissions control opportunities include low-NO<sub>x</sub> space and water heaters, or the use lower sulfur fuel oil. Because residential sources are numerous and small, implementation of a strict cap or rate requirement would be impracticable. However, a voluntary program could be an effective means of reducing emissions. Energy Star is a national voluntary program (jointly run by EPA and the Department of Energy (DOE)) that focuses on reducing CO<sub>2</sub> emissions through energy efficiency measures. Many of the energy efficiency measures promoted for reducing residential CO<sub>2</sub> emissions also reduce emissions of criteria pollutants. In addition, DOE issues energy efficiency standards for appliances. Considering the significant amounts of emissions from residential fossil use, the availability of control measures, and the potential for collaboration with the existing Energy Star program, this is a potential area for further Federal action.

Because many of the actions to reduce criteria pollutants from residential fossil use are measures that improve energy efficiency, these actions can generate cost savings for homeowners. Energy Star has a program to promote whole house retrofits, which is estimated to save homes an average of 30 percent of the total energy bill. DOE has a program that provides air sealing and insulation to qualifying homeowners, and the Department estimates the cost at \$2,672 per home with energy savings paying for costs within a few years. Energy Star programmable thermostats can save a home about \$100 per year. Note that not all actions that improve home energy efficiency will reduce criteria pollutants from residential fossil use, so not all of the cost savings from these programs would be attributed to reducing criteria pollutants.

An EPA analysis estimated the costs of a rule that would require low-NO<sub>x</sub> residential water heaters, and found that such a rule would not increase the cost of natural gas water heaters, implying a cost effectiveness of \$0 per ton NO<sub>x</sub> removed.

DOE research indicated that low-sulfur fuel oil might cost up to two cents more per gallon than conventional fuel oil. The reduced sulfur levels may lead to net savings for consumers, due to reduced maintenance and cleaning costs.

**Recommended Actions:** EPA should:

- 1) Work toward establishing low sulfur fuel alternatives for residential fossil fuel heating systems, and possible regulation of sulfur content of home heating fuels.

- 2) Talk with its Energy Star staff about the potential for an expanded voluntary program to promote actions that both improve energy efficiency and reduce criteria pollutants.
- 3) Talk with NESCAUM and other regional organizations to raise awareness of the extent to which residential fossil fuel emissions are a regional concern, and to ascertain their thoughts on voluntary programs promoted at the regional level.
- 4) Talk with companies that currently produce and/or market high efficiency appliances that reduce emissions, to assess their interest in engaging in programs to promote the installation of emissions-reducing technologies (*e.g.*, by offering rebates).
- 5) Continue to gather information about the characteristics of residential fossil fuel emissions and their contributions to nonattainment. Also gather information about the extent to which further action would gain meaningful emissions reduction beyond what has been achieved under Energy Star and what is projected to be achieved under DOE's forthcoming revised energy efficiency standards.

**Feasibility:** This recommendation has a high feasibility for implementation. A Federal voluntary program implemented in collaboration with the existing Energy Star program presumably would be implemented under the same statutory authority as Energy Star. This recommendation does not establish any proscriptive mandates that would require regulatory action. No major obstacles have been identified. Regulation of sulfur-content of home heating fuel would require a longer timeframe.

**Timing:** It is anticipated that discussions with Energy Star staff, NESCAUM and other regional organizations, as well as further information gathering, can be completed in 6 months. Once decisions are made to pursue Federal and/or regional voluntary programs, full implementation can be achieved within a year to a year and a half. Regulation of sulfur-content of home heating fuel would require a longer timeframe.

**Resources:** Collaboration with Energy Star will provide significant savings in resources, drawing on existing expertise and experience. Some additional personnel at the Federal level would be required to accommodate the expanded scope beyond CO<sub>2</sub> reductions. If regional programs are implemented then some additional resources will be required at that level.

**Priority Level:** Medium

**2.9 Guidance for Local Control Measures in Key Sectors:** *EPA, in conjunction with S/L/T and affected stakeholders, should prepare guidance for local (urban-scale) control measures to support the upcoming round of ozone and PM<sub>2.5</sub> SIPs, and, if possible, optimize multipollutant control benefits and opportunities for reducing criteria and toxic air pollutants.*

**Background/Explanation:** Many states are starting to prepare State Implementation Plans (SIPs) to address nonattainment requirements for ozone (8-hour) and PM<sub>2.5</sub>, and reasonable progress requirements for regional haze. These nonattainment (and regional haze) problems are due to impacts from nearby (local) and more distant (regional) sources. The NRC recognized that additional federal emission control measures and guidance would be useful in assisting states to effectively attain air quality standards for ozone and PM<sub>2.5</sub>. This recommendation will focus on providing guidance for local (urban-scale), multi-pollutant control measures, which are most properly dealt with by States in their SIPs. Specifically, this recommendation will focus on the current round of SIP development for ozone, PM<sub>2.5</sub>, and regional haze (i.e., SIPs which are due in 2007/2008 and address attainment in the 2010 timeframe). (It should be noted that absolute and relative amounts of emissions by source sector is expected to change beyond 2010, with significant reductions expected for at least mobile sources and EGUs.) Other recommendations address regional/national control measures for certain source categories, which are most effectively dealt with by EPA as part of federal rulemaking.

**Recommended Actions:** Federal guidance is needed now to assist states in preparing SIPs to address nonattainment requirements for ozone (8-hour) and PM<sub>2.5</sub> (i.e., attain ambient standards by 2010), and visibility/regional haze requirements (i.e., satisfy first reasonable progress milestone in 2018). The Work Group recommends that EPA, in conjunction with S/L/T and affected stakeholder, undertake the following actions:

- 1) Issue technical guidance for source categories that would benefit from local (urban-scale), multi-pollutant strategies and technologies. The identification of these source categories should be based on an evaluation of existing ambient monitoring data, source apportionment studies, modeling analyses, and future year emissions inventories. Consideration should also be given to emission reduction potential (and uncertainty in emission estimates), timeliness, cost effectiveness, completeness of existing guidance (e.g., STAPPA/ALAPCO's forthcoming "Menu of Options for Control Fine Particulate Matter"), and reactivity (if relevant). Additional studies and analyses may be necessary to provide a comprehensive list of local strategies and technologies.
- 2) Given that ozone (8-hour) and PM<sub>2.5</sub> (and haze) SIPs are due in mid-2007 and early 2008, respectively, EPA should issue guidance now for those source categories considered to be associated with residual nonattainment problems (in the 2010 timeframe). Based on a preliminary review of available ambient monitoring data, source apportionment studies, modeling analyses, and emissions inventories, it is suggested that guidance should be prepared now for the following source categories:
  - Residential woodstoves and fireplaces;
  - Mobile sources (e.g., high emitting vehicles and diesel retrofit programs);
  - Open burning; and
  - Industrial operations (e.g., cement manufacturing, petroleum refineries, pulp and paper, metals, and surface coating);

Note, the other factors identified above (e.g., emission reduction potential, timeliness, cost effectiveness, completeness of existing guidance, and reactivity) were not considered in identifying this list of source categories, but should be considered by EPA in prioritizing development of the guidance, and by S/L/T in implementing the guidance. It should also be noted that some of the source categories addressed by this local-scale guidance may also be appropriate to address at the national/regional level through federal rulemaking.

**Benefits:** This recommendation would result in guidance to help S/L/T meet the demands of preparing SIPs for ozone, PM<sub>2.5</sub>, and haze over the next couple of years. In addition, it should help support integrated, multi-pollutant emission reduction strategies, which should allow S/L/T to develop control plans more effectively (e.g., targeting source categories considered to be associated with residual nonattainment problems) and efficiently (e.g., less the time and resources compared to develop SIPs on a pollutant-by-pollutant basis).

**Feasibility:** There do not appear to be barriers associated with developing guidance for local control measures. The statutory authority for integrating area source standards into the guidance might include sections 111(d), 112(d)(4) and (5), 112(l) or 112(k)(3) and (4) of the Clean Air Act.

**Timing:** The development of the initial round of guidance would require immediate attention in order to be useful for the first round of ozone (8-hour) and PM<sub>2.5</sub> (and haze) SIPs, which are due in mid-2007 and early 2008, respectively. As such, the first round of the guidance should be issued by October 2005 and, as such, will likely be able to a few source categories.

**Resources:** The guidance can be prepared by EPA contractors and is estimated to cost around \$75K per source category.

**Priority Level:** High

**2.10 Residential Wood Smoke:** *EPA should further develop the Residential Wood Smoke Reduction initiative that includes working with S/L/T, industry, non-governmental organizations and others to support and facilitate the changeout of dirty, inefficient “conventional” (pre-New Source Performance Standard or NSPS) woodstoves with new, cleaner and more efficient heating appliances (e.g., EPA certified woodstoves). Concurrent with the development and implementation of changeout programs, EPA should commence efforts to revise the NSPS.*

**Background/Explanation:** Residential wood smoke contains PM<sub>2.5</sub> and various types of hazardous air pollutants (e.g., polycyclic organic matter). Wood smoke emissions occur in neighborhoods where people live. Wood burning is done throughout the United States, in varying degrees depending on the location. Large emissions reduction potential (60%-80%) exists and there are programs that have been successfully implemented. Residential wood smoke makes up 420,000 tons of total direct PM<sub>2.5</sub> emissions, with 80 percent of the total coming from woodstoves. Nationally residential wood smoke contributes approximately 22 percent of all seven of the carcinogenic PAHs identified in the EPA’s National Emissions Inventory. There are approximately 10 million wood stoves in use at this time, and 80 - 90 % of those are pre-NSPS stoves.

**Recommended Actions:** Build on and implement EPA’s Office of Air Quality Planning and Standards (OAQPS) voluntary residential wood smoke reduction initiative started earlier this year. Currently, EPA plans to pilot test the concept of wood stove changeouts in three locations in FY 05, and then three to six more in FY 06. In FY 06-07 EPA would work to grow the woodstove change out initiative into a grant program like the diesel retrofit program. Concurrently with the development and implementation of the voluntary initiative, EPA should commence efforts to revise the NSPS.

#### *Woodstove Changeout Campaign*

- a) Build strong partnerships with States, communities, hearth trade association, non-profits and others;
- b) Implement 3 pilot woodstove changeout demonstration projects in FY 05;
- c) Develop education and outreach materials, including website;
- d) Evaluate and document FY05 successes and lessons learned;
- e) Develop model woodstove changeout program template;
- f) Distribute template and encourage States/Locals/Tribes to implement at local level; and
- g) Issue guidance on how to quantify the emission reductions from the wood stove change outs for SIP purposes.

#### *Fireplaces*

- a) Support development of ASTM consensus test method; and
- b) Use the EPA website to educate consumers on more efficient and less polluting options.

#### *Outdoor Wood Boilers*

- a) Gather information on the nature and magnitude of air quality impacts;
- b) Support development of ASTM consensus test method; and

- c) Determine whether a regulatory or non-regulatory approach is warranted.

There are several examples (e.g., Crested Butte, CO) in various sizes of communities where voluntary residential wood burning programs have been effectively implemented, particularly in the western part of the U.S. to address PM10.

**Feasibility:** This recommendation is technically feasible because the cleaner technologies (50-70% fewer PM emissions) are available and woodstove changeout programs have been successful in the past. The idea is to greatly expand the effort and find creative ways to fund the woodstove change outs, particularly for low income families. There are no federal standards that require wood stove owners to replace their old dirty wood stoves (that owners often believe are “working just fine” and appear to last forever) with a cleaner technology. Although changeout programs in the past have depended heavily on manufacturer rebates and tax incentives, many of the people who depend on wood as a primary heating source are low income and are not in a situation such that they can take advantage of these incentives. Addressing this need will be a challenge.

**Timing:** The initiative would be gradually ramped up from demonstration projects to a program between now and 2008 in those areas where wood smoke is a significant contributor to nonattainment for PM<sub>2.5</sub> and for those areas that may be close to nonattainment for PM<sub>2.5</sub>. If communities could identify foundations, businesses or other sources to obtain funding to purchase stoves for low income families, the program could be especially effective and woodstoves could be changed out by 2008, the likely attainment dates.

**Resources:** The estimated costs to EPA for FY '05 and FY '06 are \$300,000 and 3-4 FTE for each year. If the pilots are sufficiently successful, the cost to EPA could grow to \$1M in FY 07. The cost to State/Local/Tribal areas could be up to .5 FTE per location selected to assist in EPA's pilots. If States/Locals or Tribes elect to conduct change out programs on their own using EPA's model program developed, the cost per location would likely be up to 1 FTE. If communities are successful in identifying sources of funding to purchase stoves for low income families, the amounts they would need in FY '05 would be as little as \$1-2M, and would grow in the out years to \$50M or more across the country. Manufacturers and retailers of woodstoves have historically provided rebates of 10% to 20% per stove. Regardless of whether communities are successful in securing funding to purchase stoves for low income people, some emission reductions will occur from the outreach activities that EPA and the State/Local air pollution control agencies conduct and the economic incentives provided by the manufacturers and retailers, however the magnitude of the reductions would be significantly lower. Additional funds would be needed for EPA to revise the NSPS.

**Priority Level:** High

**2.11 Open Burning:** *EPA should work with S/L/T to encourage more vigorous control of open burning, especially in, and adjacent to, counties with Class I areas and counties classified as nonattainment for fine particles or ozone.*

**Background/Explanation:** Open burning has been a difficult source of emissions to control due to the complexities of alternative waste disposal methods, associated costs, and the mindsets of many Americans who view open burning as acceptable and of little consequence to their health. Yet open burning releases substantial emissions of fine particles, volatile organic compounds, and carbon monoxide and lesser amounts of organic carbon, oxides of nitrogen, and other pollutants of concern. Emissions from open burning, released near the ground and most often in relative proximity to inhabited areas, contribute to urban smog, regional haze, and elevated fine particulate and ozone readings and cause periodic localized exposures in excess of acceptable risks.

**Recommended Actions:** EPA should:

- 1) Survey State and Local agencies and Tribes, identify current levels of control of open burning nationwide, and update open burning emissions and control information.
- 2) Develop SIP guidance for States, Locals, and Tribes to outline procedures and calculation methodologies for determining emissions reductions credit for more stringent regulation of open burning activities.
- 3) Consolidate information on open burning emissions and health impacts into updated informational documents, brochures, and flyers.
- 4) Develop an outreach strategy designed to inform States, Locals, and Tribes of the impacts of open burning on air quality and to encourage tighter controls in areas with inadequate regulation of open burning.
- 5) Encourage States, Locals, and Tribes to include bans or more stringent restrictions on open burning in counties with a nonattainment area or a Class I area and in counties adjacent to, or impacting, those areas.
- 6) Consider making open burning control strategies a component of nonattainment SIPs.
- 7) Develop a model open burning rule for use by States, Locals, and Tribes.
- 8) Work with EPA's Office of Solid Waste to determine if a national open burning rule is worthwhile and, to the extent that such a determination is made, pursue development and implementation of such a rule.

States, Local agencies, and Tribes should:

- 1) Review available data on emissions from open burning.
- 2) Seek tighter controls on open burning within their jurisdictions and especially so in the vicinity of nonattainment and Class I areas.
- 3) Mount substantial public education campaigns to advise citizens of the impacts of open burning and disposal alternatives.
- 4) Develop comprehensive waste management and disposal methods that reduce the inclination of citizens to burn waste materials.

**Benefits:** Implementation of this recommendation would benefit public health by reducing exposure to fine particles, ozone, NO<sub>x</sub>, VOCs, carbon monoxide, and toxic air pollutants. Improvements in visibility would also be achieved which would help address the aesthetic goals of the regional haze program. The nation's air pollution control agencies would benefit through the resultant additional emission reductions that would contribute to meeting national ambient air quality standards and aid in meeting reasonable further progress goals of the criteria pollutant and regional haze programs.

**Feasibility:** This recommendation has a high feasibility for implementation because it can be completed under existing statutory authority. It does not establish any proscriptive mandates that would require regulatory action, with the exception of the recommendation to consider making open burning control strategies a required component of nonattainment SIPs and to review the possibility of creating a national open burning rule. Concerns include additional staff time to conduct research and prepare informational documents, local reluctance to impose additional regulatory controls on citizens, and inadequate regulatory agency staffing to enforce the requirements at the Local, State, and Tribal level.

**Timing:** It is anticipated that the bulk of this recommendation could be implemented within one year because only research and informational brochure development must be completed. The exceptions are development of implementation guidance requiring open burning controls in SIPs and possible development of a national open burning rule.

**Resources:** Redirection of existing efforts and personnel would be required. No significant additional EPA resources are anticipated to implement this recommendation because the protocol is non-regulatory and does not have to go through a formal public process. At the State, Local, and Tribal level, enforcement of open burning requirements would place additional demands on compliance staff, only some of which could be absorbed with current resource levels.

**Priority Level:** Medium

**2.12 High-Emitting Gasoline Vehicles:** *EPA and S/L/T should reduce emissions from high-emitting gasoline vehicles that are believed to contribute a high fraction of mobile source emissions.*

**Background/Explanation:** Most people are aware that increasingly stringent regulations on new vehicle tailpipe emissions and improved durability of emissions controls have had a large and positive effect on reducing overall fleet emissions. What is less well known is that an increasing portion of the remaining emissions result from a relatively small fraction of high-emitting vehicles, and that future emissions reduction will depend to an increasing degree on developing an effective and politically acceptable means of identifying and dealing with these vehicles.

To date, the primary program for identifying high-emitting vehicles has been periodic tailpipe testing within vehicle inspection and maintenance (I/M) programs. Some I/M programs have begun to phase out tailpipe testing for more recent (1996 and later) vehicles in favor of using the onboard diagnostic (OBD-II) systems included in these vehicles. While other methods, especially on-road vehicle remote sensing, have proven effective, in some cases, at evaluating fleet emissions and, in a more limited role, in “clean screening” and “high-emitter identification” programs, existing systems and methods have not yet been demonstrated to be sufficiently effective to serve as the basis for a large scale high-emitter identification program.

California is considering a catalyst replacement program for model year 1984 to 1994 vehicles. The replacement would be an OBD-compliant aftermarket converter. Preliminary testing has shown significant, cost effective emission benefits. Incentives may be required to encourage replacement when a vehicle is still meeting the required standards.

**Recommended Actions:** EPA and States/Locals/Tribes should:

- 1) Determine the aggregate impact of high-emitters on today’s mobile source vehicle inventory. Identify those areas where emissions from high-emitters contribute significantly to the mobile source inventory. Analyze available data and develop new data sources such as EPA’s Kansas City study. Use untapped existing or new data sources such as I/M databases and new manufacturer-run in-use data as it becomes available.
- 2) Develop better means for analyzing EPA and manufacturer in-use testing data and vehicle I/M records to identify patterns of vehicle emissions failures both as an aid in repairing these vehicles and to provide feedback to manufacturers for improvements in the durability of emissions control systems.
- 3) Encourage the continued development of on-road vehicle remote sensing or other technologies that show promise for serving as the basis for future high-emitter identification programs for pre-1996 vehicles. Until an effective and appropriate alternative is available, encourage States to maintain their I/M infrastructure and to continue testing pre-1996 vehicles.
- 4) Continue to evaluate the effectiveness of OBD systems, tailpipe emissions testing, and new technologies to identify post-1996 high-emitting vehicles.
- 5) Make use of new technology as it becomes available in remote sensing and OBD to improve detection.
- 6) Continue to work with State and Local I/M programs to provide technical information to assist repair technicians regarding emissions-related failures and appropriate corrective

actions and, where appropriate, to advocate and support programs that remove from service and scrap high-emitting vehicles, especially those not OBD-II equipped, for which cost-effective repairs cannot be made.

- 7) Continue outreach on OBD to increase public response to repair high-emitters after they are detected.

**Feasibility:** High. Some programs to gather needed data are already underway, such as the OBD high-mileage study and the Kansas City study. EPA (or other stakeholders) would need to devote additional resources to collect additional data to accurately determine the impact of high-emitters. Other steps depend on development of new technology by others.

**Timing:** It is anticipated that these recommendations can be implemented in 3 to 4 years as current studies are completed, new data becomes available for I/M and manufacturer in-use data, and additional studies are initiated and completed.

**Resources:** Redirection of existing efforts and personnel would be required for new work while existing resources would be used for work already underway.

**Priority Level:** Variable (depends on the impact of high-emitters on inventory)

### **2.13 Conformity:** *Conformity should be retained as part of the nation's AQM system.*

**Background/Explanation:** The NRC found that “although individual vehicle emissions have been reduced substantially over the past 30 years, those improvements have been offset at least partially by continued increases in vehicle miles traveled (VMT)” (*Air Quality Management in the United States*, p. 139). The technology-based emissions standards under Title II of the Clean Air Act limit pollution levels from each vehicle but not the total pollution from in-use motor vehicles. Conformity is the key Clean Air Act program designed to manage cumulative emissions. Transportation conformity requires that the overall air pollution levels from motor vehicles on highway segments and in a metropolitan area, including emissions due to planned transportation projects, will be consistent with emissions levels necessary to assure the timely attainment and maintenance of the health-based national ambient air quality standards.

The NRC found that the transportation conformity program has “fostered greater interaction” between transportation planning and air quality regulatory agencies (p. 141). As a result, these agencies have gained “more knowledge about and a greater appreciation for one another’s missions, responsibilities and procedures”; furthermore, “most transportation officials also seem to accept the legitimacy and high priority of environmental values in transportation decision-making” (141).

The NRC also determined that “the conformity requirement has had the largest impact on NAAQS nonattainment areas experiencing rapid growth” (141). A pivotal prospective question, in the NRC’s judgment, is how “the conflicts between transportation and air quality goals in such areas will be resolved and whether the federal government will remain firm in enforcing the regulation” (142).

#### **Recommended Actions:**

- 1) Transportation conformity must be retained.
- 2) Conformity’s current key requirements and schedules must be retained and effectively enforced as an important measure to help achieve and maintain compliance with the national ambient air quality standards. The current planning timetable requiring transportation plans to have a 20-year horizon is consonant with the long-term planning and investment in new highway projects as well as central Clean Air Act timetables for nonattainment and maintenance plans. To ensure durability and integrity in the air quality planning and management process, EPA must continue to require conformity to attainment emissions budgets after the year of attainment has passed. The requirement to revise transportation conformity analyses every three years is necessary to ensure conformity is based on current data and is consistent with EPA’s recently adopted State requirement for triennial emissions inventory reporting.
- 3) Future administrative action should consider: (1) protection of sensitive populations from localized, elevated particle pollution concentrations due to vehicle emissions near highways, interchanges, terminals, and schools; and (2) expansion of emissions budgets under the general conformity program to limit emissions from other significant transportation sectors including, for example, marine ports, rails, airports and freight.

**Feasibility:** Maintaining the current requirements and schedules is highly feasible. It is uncertain whether legislation supported by the administration, that would shorten the period of time covered by conformity determinations, will be adopted.

**Timing:** No program disruption will occur if the current requirements and schedules are maintained. If legislation to shorten the time period covered by conformity becomes law, it would take effect immediately.

**Resources:** Maintaining the current requirements and schedules requires no additional resources. Legislation shortening the time period covered by conformity determinations would not require any significant resources and might reduce the conformity-related burden in some areas. However, long-term air quality impacts of on road emissions will no longer be evaluated. EPA headquarters would be required to revise the conformity regulation to account for this.

**Priority Level:** Low

(Note: Priority is low because there is an effective program in place. At this time, areas are not having significant problems demonstrating conformity for the final year of their transportation plan. This is most likely due to emission reductions attributable to the Tier 2 and heavy-duty diesel rules.)

**3.1 Align SIP Submittal Dates:** *Because ozone, PM<sub>2.5</sub>, and regional haze SIPs have similar elements and are likely to contain similar control strategies, EPA, the States / Locals / Tribes, and other stakeholders should strive to align the submittal dates of the three SIPs. This recommendation is not intended to suggest changes to any deadlines for attainment or implementation of control strategies, or to imply that a single SIP should be required for ozone, PM<sub>2.5</sub>, and regional haze. It is further recommended that, in the future, EPA should align designation dates, as appropriate, to promote multipollutant SIP development.*

**Background/Explanation:** Finding a way to combine all of these SIPs would provide immense efficiencies for the States, regional planning organizations, the public and EPA. The deadlines are close enough in time that a way should be found for States to be able to develop the three SIPs together.

For many States there is likely to be overlap between the technical basis for, and the ultimate development of, control strategies necessary to address the 8-hour ozone, PM<sub>2.5</sub> and regional haze SIPs. For example, regional NO<sub>x</sub> reductions from the same source categories will likely be a necessary element for all three plans. The resources saved from a holistic analysis and the development of a single strategy as opposed to incremental adjustments within a few months time has the potential of being significant. Similarly, whether the State develops a single SIP or separate SIPs, the logistical resources associated with the processing of SIPs and the public participation process has the potential to be reduced if multiple hearings, analyses and responses to comments are not necessary due to the disparate deadlines.

**Recommended Actions:** Because PM<sub>2.5</sub>, ozone and regional haze share some of the same precursors and because the timelines are similar, EPA, the States / Locals / Tribes, and other stakeholders should strive to align the submittal dates of these three SIPs. However, recognizing that it is difficult for States to accelerate adoption of the PM<sub>2.5</sub> and regional haze SIPs to coincide with the schedule for 8-hour ozone SIPs, EPA should identify incentives (modeling assistance, other technical assistance, resources, detailing of personnel, etc.) it could provide States in order to assist them in accelerating the States' preparation of regional haze and PM<sub>2.5</sub> SIPs.

**Feasibility:** The time frames for regional haze and PM<sub>2.5</sub> are aligned; however, the time frames for ozone and PM<sub>2.5</sub> are offset by 6 to 8 months. Aligning all three SIPs or developing a multipollutant SIP will require an acceleration of planning for PM<sub>2.5</sub> and regional haze.

There are also technical issues with multipollutant modeling (discussed below). However, traditional modeling could still be used to develop a multipollutant SIP. States' unfamiliarity with multipollutant modeling is a challenge for accelerating schedules. CAMx and CMAQ are photochemical grid models that are being used to assess 8-hour ozone, PM<sub>2.5</sub> and regional haze. These models are currently being used by States and EPA for various purposes but experience is still limited. In addition, the modeling episodes for different pollutants will be different as ozone is a summertime problem and PM is a year-round problem. This may reduce the resource savings that can be obtained by developing these SIPs together.

**Timing:** For this option to be meaningful for the next round of SIPs, States would need guidance/ability to develop such SIPs in the immediate future as SIPs will be due in the 2007 (ozone) to 2008 (PM<sub>2.5</sub>/regional haze) time frame. Even if developed within a year, guidance may not be timely enough for States to use, particularly those that have long rule making time frames.

**Resources:** Whether States develop these SIPs together or separately, States and EPA will need to develop the resources to implement these SIPs. Implementation of a multipollutant approach

may require increased resource commitment in the beginning in order to achieve resources savings in the long term.

**Priority Level:** High

**3.2 Protocol for SIP Development:** *Each State should work with the appropriate EPA Regional Office to develop and implement a protocol for SIP development and processing that would lay out responsibilities, expectations, and timelines for all parties. While a model protocol should be developed, the EPA Regional Office and each State should have the flexibility to design a protocol tailored to their specific needs.*

**Background/Explanation:** The lack of effective and consistent communication between States and EPA historically has been an impediment to development and processing of SIPs. EPA does not always provide assistance to State, Local and Tribal agencies early enough in their planning processes to address issues such as inventories, modeling, quantification of reductions from particular control strategies, and regulation review. Likewise States and Local agencies do not consistently provide EPA with draft versions of SIPs to review and comment upon prior to the formal public comment period and hearing. This lack of coordination has resulted in difficulties in meeting Clean Air Act deadlines for submittal of required SIPs.

Many States will face the difficult challenge of having to develop three major SIPs, for ozone, PM<sub>2.5</sub> and regional haze, within the next three years. There will be many issues requiring EPA input and approval which must be accomplished in a methodical way. Consequently, some States and Regions may wish to take advantage of this protocol concept to ensure the timely development, submittal and approval of these SIPs.

**Recommended Actions:** To avoid delays in the SIP approval process and to limit the insertion of new demands by EPA late in the process (after public hearings and legislative action are well underway at the State level):

- 1) EPA should develop a model protocol that, if desired, could be used by its Regional Offices in negotiating specific protocols with their States.
- 2) EPA Regional Offices and their States should jointly foster the development of a protocol outlining the SIP process. This protocol should:
  - a) Include enough flexibility to address all types of SIP submittals, though more complex control strategy SIPs may need an expanded version of the basic protocol to include emission inventory development, model selection, etc. For example: attainment demonstrations, and rate of progress (ROP) plans for PM<sub>2.5</sub>, ozone and regional haze.
  - b) Lay out responsibilities and expectations of all parties as they move through the entire process.
  - c) Include input from not only the State and the EPA Regional Office, but also the Office of Air and Radiation and the EPA Offices of Regional and General Counsel as appropriate.
  - d) Be signed by the Regional Administrator and the State Secretary (may be delegated to the EPA Regional Air Division Director and State Air Director).
  - e) Identify the role of any Regional Planning Organizations (RPOs) or Multi-Jurisdictional Organizations (MJOs) in process.
  - f) Incorporate regular mechanisms for communication (e.g., monthly State-EPA calls); expected turnaround for EPA review of State materials (e.g., interim approval steps); and more streamlined processes for simpler SIPs.

- g) Include accountability mechanisms such as a computer-based system which tracks the scheduled dates and actual dates of completion of each step of the protocol to ensure that EPA and the States follow the agreements. An analysis of both State and EPA performance should be conducted annually and any corrective actions identified.
- h) Identify the role of any MJO or RPO in process.
- i) Recognize that under EPA's formal Delegation Manual, SIP approvals have been delegated to the RAs.
- j) Include a process whereby a State consults with Tribal governments potentially affected by the SIP.
- k) Include a process whereby a Tribe, especially one in a nonattainment area, may work with the State in developing a SIP for that area.

**Feasibility:** This recommendation is certainly legally feasible to implement because it may be completed under existing statutory authority and only requires that a State and Regional Office develop and sign a protocol.

Issues/Obstacles may include:

- The model protocol may suggest timelines; however, each State and Region must have the flexibility to negotiate the timelines in a specific protocol recognizing such issues as the differences from State to State in the length of their adoption processes. Realistic timelines will aid in long-term accountability.
- Some EPA Regional Offices have multiple SIPs being developed in as many as six to eight States simultaneously. Therefore, any model protocol will recognize that work load and be realistically tailored to fit the needs of a given State and Region.
- Not all States and Regions feel that such a protocol is a high priority dependent upon the current State/Regional relationship and whether or not a significant SIP backlog exists in the Regional Office.

**Timing:** It is anticipated that this recommendation can be implemented in 6-9 months for the protocol itself to be developed. To be most useful, should be completed within that time frame. Additional time will be needed for signature agreements and to establish a tracking mechanism or to modify each Region's current tracking system to reflect the timelines of the protocol.

**Resources:** Redirection of existing effort and personnel. No significant additional resources are anticipated to implement this recommendation because the protocol is non-regulatory and does not have to go through a formal public process. The cost associated with this recommendation is the time of the EPA Regional and State personnel charged with the development of the protocol.

**It is strongly recommended that personnel with experience in both SIP development and SIP processing undertake the development of the protocol.**

**Priority Level:** High

**3.3 Clearinghouse of Approved SIPs:** *EPA should develop a website, similar to the Best Available Control Technology (BACT)/Lowest Achievable Emission Rate (LAER) clearinghouse, containing interpretations of rules and other SIP/TIP approval-related issues. This website could contain both policy and/or technical information depending on how it is developed. Each EPA Regional Office should develop a website, to be updated every 12 months on or about October 1, that identifies and provides links to all statutory and regulatory requirements in the federally approved SIP, including associated State and federal legal citations and effective dates.*

**Background/Explanation:** Questions regarding general SIP/TIP approvability arise with some frequency. Many times these questions have been already been raised and answered. Because there is no central repository for this information, the process for finding answers, or even creating an entirely new process to arrive at the same or different answers, can be very time and resource consuming.

An October 1<sup>st</sup> update for the Regional Office website is important because the term "updated annually" could result in updates occurring, for example, on January 1, 2005, and December 31, 2006, which meet the "annual test" but would be in actuality a 2-year span.

**Recommended Actions:** EPA should develop this clearinghouse. This would probably be on the Technology Transfer Network portion of EPA's website but could be developed by a Region or Regions and/or OAQPS. It is important that information is easily accessed on the website or it will have defeated its original intent.

Additionally, each EPA regional office should develop a website containing all of the statutory and regulatory content of the applicable SIPs over which it has jurisdiction. For each statutory and regulatory requirement in the applicable SIP, this website should contain at least the following information: (a) a citation of (including title) and link to every State statute and regulation that is included in the applicable SIP; (b) the State effective date; (c) the federal publication date; (d) the federal effective date; and (e) the applicable federal register citation. Each of the above websites should be updated no less frequently than by October 1 of each year.

**Benefits:** A centralized and publicly available database of SIP approval issues, responses to comments, and other types of decisions would assist EPA staff, States and the public to understand what issues have arisen previously and how they were decided. This would improve efficiency and consistency of Federal, State, Tribal and Local agencies.

**Feasibility:** Feasibility is high. This would not require any legal, statutory or regulatory changes. Possible hurdles include lack of resources.

**Timing:** Timing on this project is not critical as there are no deadlines that would render this project obsolete. It could, however, be helpful in developing the upcoming ozone, PM<sub>2.5</sub> and regional haze SIPs if it was done sooner.

**Resources:** There may be direct monetary costs associated with this project if contractors are used. Otherwise it will require personnel hours which would be spent finding information, designing this website, actually building the website, filling in the database, etc.

**Priority Level:** Medium

**3.4 Streamline Minor SIP Revisions:** *For the SIP approval/disapproval phase of the air quality management process, EPA should establish a de minimis level for SIP revisions and streamline the processing of these revisions by the use of “letter approvals” or similar expedited procedures signed by the Regional Administrator. EPA should, in consultation with S/L/T and other stakeholders, develop a listing of the types of SIP actions that are eligible for streamlined processing.*

**Background/Explanation:** There are certain SIP revisions submitted by States which revise only administrative State requirements, apply to a very narrow and often specified group of sources in a small geographic area, and/ or have quantifiable emissions changes (increases or reductions) which have minimal (i.e., *de minimis*) impact on overall emissions levels or PSD increment consumption in a given geographic area (especially designated attainment areas). Yet, such official State submittals must still undergo the full administrative process that is required of all Federal rulemaking actions. A survey of SIP revisions that are currently undergoing review in the Regional offices is likely to reveal that a significant number (perhaps 25% to 35%) of all formal SIP submittals consist of State provisions which would result in a *de minimis* impact. Because of the sheer volume of these revisions, the processing by EPA is often slow, and becomes a source of frictions between States and the Regional Offices. This process includes a separate review by the Office of Management and Budget (OMB) of all final rulemaking actions where EPA announces full disapproval of a SIP revision request.

**Recommended Actions:**

- 1) EPA, with input from States and Tribes (both program offices and attorneys) should institute a process for developing guidance which defines what could be considered *de minimis* with respect to SIP revisions, both in terms of subject matter and emissions limit. Regulatory change which could increase emissions on a nonattainment area or an OTC-like area or which would result in consumption of a PSD increment might not be candidates for the *de minimis* process. However, some source-specific emission limit changes might be considered *de minimis*. Also, recodification actions which involve no substantive revisions to a State’s regulatory text could be considered *de minimis*, as might be revisions where State incorporates by reference an existing Federal requirement.
- 2) EPA should revisit and update the January 30, 1989 policy memo on letter notices, and see whether such actions could still be used for the processing of *de minimis* actions. Also, if a SIP revision is processed through a letter notice, then we need clear guidance from OGC as to what the effective SIP date would be.
- 3) As an alternative, EPA could “bundle” in one rulemaking action (direct final, whenever possible) a series of separate formal SIP submittals which meet the *de minimis* criteria.
- 4) EPA should work with the Office of Management and Budget (OMB) to explain the concept of *de minimis* actions and request an exemption to the OMB review process in the event of a full disapproval of a *de minimis* SIP action.
- 5) EPA should apply, as often as possible, the *de minimis* review process to other low-key Federal plan actions such as Section 111(d)/129 plan revisions.
- 6) EPA should work with States to ensure that certain State administrative provisions governing the State regulatory and enforcement process are not submitted as SIP revisions, not even under a streamlined *de minimis* process. Section 110 only requires that States have a public hearing process and an enforcement program. The State procedures, by which public hearings are announced, held and recorded or how search

warrants are obtained and executed need not be in the SIP. The exemption of such State administrative provisions from SIP review would prevent the tying-up of EPA resources to process SIP revisions that have virtually no environmental impact.

**Feasibility:** The feasibility of this process depends on certain legal decisions:

- 1) Whether EPA, States, and Tribes can come to consensus as to what constitutes a *de minimis* revision.
- 2) Whether the issuance of an approval letter notice can set the effective date of the SIP or other plan revision. If the attorneys determine that only a Federal Register notice action can set the effective date, then the use of letter notice procedures may not produce the desired outcome of expeditious SIP processing. However, if the attorneys come to a consensus that making SIP actions effective through the issuance of letter notices meets the requirements of the APA, and results in expedited Federal effective dates, then the use of Letter Notices for *de minimis* actions should be utilized to the fullest extent.
- 3) Whether OMB is likely to grant an exemption for its review of a full disapproval action, if such action is taken for a revision that EPA has determined to be *de minimis*.
- 4) Whether further streamlining of the Direct Final Rule process could be considered. Examples would be a 15-day comment period or an effective date of 45 days after publication of the Direct Final rule notices.
- 5) How the RME Docket system, which enhances the public's ability to review and comment on EPA decisions, would need to be modified to accommodate EPA decisions made through a letter notice or similar expedited processes.
- 6) Whether EPA would have to develop and publish a blanket rulemaking action to explain to the public how the rulemaking process of *de minimis* actions would be handled. EPA followed this step to explain: 1) the use of the direct final rulemaking process; and 2) the rule process which allowed Regional Administrators to sign final rulemaking actions. Such a formal action on the process of handling *de minimis* actions may assure the legality of the use of the expedited process for individual *de minimis* actions.

**Timing:** This recommendation could be implemented in 12 to 18 months since 1) processes and procedures need to be developed; and 2) EPA would have to prepare a Federal Register notice signed by the EPA Administrator, announcing to interested parties the streamlined rulemaking process for *de minimis* SIP [and other plan] actions.

**Resources:** EPA could utilize the standing National SIP Processing Work Group, comprise of representatives from all 10 Regions, OAQPS and OGC. The Work Group also interacts with EPA's Federal Register liaison as well as legal staff from the Office of the Federal Register. If so determined, the Work Group could work with a committee of State and Tribal representatives to help implement the process to define the scope of *de minimis* SIP [and other plan] actions and a process for providing expedited Federal Review.

**Priority Level:** High

**3.5 Timely EPA Guidance:** *EPA guidance should be issued in sufficient time for States to meet their SIP development deadlines. EPA should involve S/L/T and other appropriate parties in its guidance development process. In cases where guidance is delayed, EPA should take into consideration States' efforts to meet deadlines without the benefit of the appropriate policy guidance.*

**Background/Explanation:** States cannot develop SIPs without guidance. Frequently, States are placed in the position of having to prepare SIPs under a specific deadline, but are dependent on EPA to develop guidance for the SIP. Delay by EPA in preparing guidance can cause: 1) States to be rushed in meeting their deadlines; 2) States to miss deadlines for submittal; and 3) States to develop SIPs which may later have to be revised in order to be accepted. This can lead to criticism of EPA due to lack of timely performance and blame of EPA for failure to make timely SIP submittals. Missing deadlines can cause States embarrassment and criticism from the public, at a minimum, and can cause sanctions, at worst. EPA is also criticized for not involving stakeholders (States/Tribes and others) in development of guidance. Not involving stakeholders usually results in guidance that is difficult to implement, requires excessive resources by the States and invites litigation by the excluded stakeholders. This paper focuses on SIP actions; however, if there are non-SIP actions where EPA guidance is critical and timing is of the essence in order to avoid an adverse reaction, such as sanction clocks, then the product of this effort should be implemented in those situations as well.

**Recommended Actions:**

- 1) EPA should institute a process for developing guidance which:
  - a) Recognizes the timeline the States are under to implement the SIP involved.
  - b) Establishes a priority and plan which will ensure that the guidance is published in time for State's use to meet deadlines.
  - c) Includes stakeholders in developing the guidance, guidance review and setting the priority for guidance. The Clean Air Act Advisory Committee (CAAAC) could serve this role, as could STAPPA. The chosen organization should also evaluate a restatement by EPA of what the agency is doing now and determining if modifications to our stakeholder process are necessary.
  - d) Ensures that adequate EPA resources are applied to the guidance.
  - e) Delegates decisions within EPA to facilitate more timely guidance.
- 2) This process should be accomplished as a pilot. The pilot should explore what regulation/guidance development within EPA is felt by States and stakeholders to be working well. In the short term, the best aspects of process(es) determined to be working well should be identified and instituted into this process for developing guidance.
- 3) EPA responds best when under a deadline. This is especially true for actions under court deadlines or consent decree deadlines. In order to set deadlines, EPA should indicate in the final Federal Register notice if any guidance is still needed after a rule is finalized. The Federal Register should identify the target date for completion of such guidance.

**Feasibility:** The recommendation is feasible in that it only requires the establishment of a process to ensure the timely development of guidance. One obstacle to accomplishing this may include established organizational bureaucracies which have review and concurrence authority and do not have responsibility for meeting deadlines in guidance development. In other words, there should

be as much urgency in developing guidance as there is in developing rules. Another obstacle may be lack of staff resources necessary to develop the guidance in the necessary time frame. Staff are often working on multiple projects at any given time and cannot always devote the time needed to develop the guidance and follow it through the review and concurrence process.

**Timing:** This recommendation should be implemented in six months. Since it would not be tied to any one specific SIP schedule, it is difficult to specify a due date, other than as quickly as possible.

**Resources:** Resources should be a small project team made up of staff with experience in guidance document preparation, and process and procedures development. Guidance is nonregulatory and will not have to go through a formal public process; therefore, no resources required for public process.

**Priority Level:** High

**3.6 Avoid Unnecessary Public Hearings:** *EPA should work with States and Tribes to develop a model regulation that would require a public hearing for SIP revisions only if one is requested after public notice. This recommendation is not intended to restrict public comment in any way; it is meant only to eliminate those hearings that no one attends.*

**Background/Explanation:** The CAA has long been interpreted to require a public hearing be held by States for all SIPs and SIP revisions prior to their submittal to EPA. Holding public hearings is resource-intensive in terms of time and expense to the State. The use of State resources is justifiable when interested parties testify at the hearing. However, those resources are wasted in many instances where no comments or testimony are offered at the public hearing.

Section 110(a)(2) of the CAA requires that States hold a public hearing for any prospective SIP revision. This requirement is repeated in regulations at 40 CFR 51.102. However, 40 CFR 51.102(g)(2) provides that “Procedures different from this part may be approved if they (i) ensure public participation in matters for which hearings are required; and (ii) provide adequate public notification of the opportunity to participate.” Minimal case law exists to judge what EPA might be able to approve as a *de minimis* deviation from holding a public hearing for every prospective SIP revision. It is certainly possible, however, that revisions that do not involve rule revisions, *de minimis* rule revisions that involve no changes to what the regulated community is required to do, most maintenance plan revisions, and many source-specific revisions may be defensible candidates for EPA approval based upon a process whereby the State offers the public the opportunity to request a hearing but holds such hearing only upon request.

**Recommended Actions:** A workgroup comprised of members of EPA’s Office of General Counsel, EPA Regional Counsels and States Attorneys General, and Tribal attorneys<sup>13</sup> should undertake a review of the CAA to determine whether a holding a public hearing only upon request could satisfy section 110(a) for SIPs/SIP revisions. The workgroup should address the following questions:

- Is a statutory change to the CAA is required?
- If not appropriate for all SIPs, can a subset of SIP revisions be identified where a holding a public hearing only upon request would be sufficient to satisfy the CAA?
- Are there Tribal laws or considerations that would impact the issue differently for TIPs?

If no statutory changes to the CAA are required, the workgroup should develop a model regulation for States adopt for SIP approval that provides the circumstances and procedures for holding SIP revision hearings only upon request to satisfy section 110(a). If statutory changes to the CAA are required, the workgroup should identify what provisions of section 110(a) must be revised and recommend language for such changes. This recommendation is not intended to address issues of who has standing to request a public hearing; the recommendation assumes that if anyone requests a hearing, then a hearing will be held.

**Feasibility:** Some subset of SIP revisions may be able to be identified for which the State could provide the opportunity for a public hearing and hold one only upon request to satisfy section

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<sup>13</sup> EPA and an interested State should pursue a pilot project to explore specific procedures to use for specified types of prospective SIP revisions and to explore the legal issues of instituting and implementing such procedures. The State of Minnesota has commenced this process with EPA Region 5. They should participate in and advise the recommended workgroup of their efforts.

110(a). To make the opportunity for hearing only upon request sufficient for all SIP revisions may require a statutory change to section 110(a).

**Timing:** The legal workgroup could be convened by EPA, ECOs/STAPPA/ALAPCO, NTC and charged with completing the recommended actions by a given date. The Recommended Actions should be implemented as soon as possible and completed well before the next round of SIPs revisions are required for 8-hour ozone, PM<sub>2.5</sub> and regional haze.

**Resources:** The cost to EPA/States/Tribes would be the time of their attorneys.

**Priority Level:** High

**3.7 Facilitate Redesignation Process for Certain Areas:** *For those areas that have not pursued and been granted redesignation when initially eligible, and have continued to demonstrate violation-free ambient air quality data for several years, EPA should expedite the redesignation process. EPA should ensure that all Regions and States are aware of the simplified procedures. This recommendation is not intended to change the requirements for redesignation under the CAA.*

**Background/Explanation:** States should not be required to meet needlessly complex and resource-intensive requirements to redesignate nonattainment areas that have five or more years of violation free ambient air quality data that has been quality assured/quality controlled and entered into the national Air Quality Systems database. This is particularly true of areas with slow or no projected growth in emissions over a ten-year maintenance period.

**Recommended Actions:** All EPA Regional Offices should disseminate and provide any needed assistance on the implementation of both the May 10, 1995 Clean Data Policy (CDP) and the “Limited Maintenance Plan Option for Moderate PM<sub>10</sub> Nonattainment Areas, commonly referred to as the Limited Maintenance Plan Policy (LMPP). The CDP allows the Part D SIP requirements of an approved attainment demonstration, rate of progress (ROP) plan and their associated contingency measures to be waived in areas with three or more years of violation free data. Similarly, the Limited Maintenance Plan Policy (LMPP) can exempt an area from modeled maintenance demonstration. These policies change and simplify the technical requirements for redesignation, not the legal requirements.

**Feasibility:** This recommendation is feasible. It has already been implemented on a limited basis by EPA Regions 3 and 4 during the processing of several state redesignation requests (and associated maintenance plans) for ozone and PM<sub>10</sub>. The use of the CDP and LMPP has not yet faced a legal challenge but, properly implemented, both policies are considered defensible by EPA's Office of General Counsel.

Currently, there are issues restricting the use of the CDP and LMPP for SO<sub>2</sub> and CO nonattainment areas. These issues are addressed in the September 4, 1992 memorandum entitled, “Procedures for Processing Requests to Redesignate Areas to Attainment.”

Many States choose not to redesignate because there are no regulatory drivers encouraging redesignation; plus States may find advantages to retaining nonattainment status.

**Timing:** Can be implemented immediately.

**Resources:** The only resources necessary would be those in educating the EPA Regions, State/Local/Tribal entities that are unfamiliar with these policies.

**Priority Level:** Low

**3.8 Effective Communication with Constituencies:** *EPA, along with S/L/T should develop a menu of options for effective communication to build support with a wide variety of constituencies for clean air plans at the S/L/T level.*

**Background/Explanation:** The NRC report concluded that the SIP process is overly bureaucratic, drawing attention and resources away from the relevant issues of tracking progress and assessing performance. Both State officials and the regulated community complain that the planning process is cumbersome, lengthy and difficult for the public to comprehend, which encumbers the goal of developing and adopting air quality control plans, and attaining and maintaining national ambient air standards.

**Recommended Actions:** Elements of these plans are frequently the subject of public lawsuits. Yet successfully engaging the public early in the SIP development process builds general understanding and support. Although some States and local air agencies achieve this through their current outreach programs, some do not. These discussions are timely as States prepare to develop SIPs for new federal ambient air quality standards for 8-hour ozone and PM<sub>2.5</sub>.

A more aggressive marketing approach can help educate the public about the need to clean up local air pollution; getting the public involved in the SIP process is much more difficult. Often air agencies only hear from those members of the public who have 1) time and resources to send representatives to meetings; or 2) financial interests at stake, which make the expenditure of time and resources worthwhile. Even the environmental community often cannot participate fully due to limited staff and financial resources.

Influencing community opinion leaders is a tested means of shaping public opinion, particularly in the short-term. However, all too often State and federal agencies do not use these techniques because of staff and resource limitations or department policies which constrain outreach. Although transmitting a message to the people who help shape public opinion is critical, merely sending press releases or letters of invitation to a community meeting is not effective. States and local air agencies must engage them directly.

Building support for newer pollutant programs requires public education about the direct health risks associated with ozone and PM Fine. Effective outreach is most often achieved at the local level, where communities can relate to specifics and risks that may effect them and motivate behavioral change. Some methods to collaborate with States and engage the public locally could include the following actions:

- Target key opinion leaders. States and local air offices should initiate or expand the use of editorial board meetings to reach key media opinion leaders.
- States and locals should develop relationships with local reporters covering the issue.
- All States and locals should be sure that the Air Quality Index is forecast and reported in weather reports in their communities.
- States and locals should meet with local leaders in the Chambers of Commerce in their areas.
- States and locals should make presentations to key civic groups in the community.
- States and locals should meet with leaders in the religious community and work with them to reach out to their membership.

- States and locals should meet with leaders in neighborhood associations and work with them to reach out to their membership.
- States and locals should meet with local and State environmental and public health groups to enlist their involvement in the process and their partnership in outreach efforts.
- States and locals should meet with key elected officials early and often in the process to keep them and their key staff informed.
- EPA should host focus group meetings to identify messages that build support for these issues.
- EPA should develop outreach materials targeted to diverse communities that explain the SIP process and the health effects of air pollution.
- EPA should offer training on efficient web content development for local government sites, incorporating AIR NOW real-time ozone and PM projections.
- STAPPA/ALAPCO and EPA should identify and catalog existing resources and develop additional appropriate tools based on targeted audiences.
- EPA should schedule State public meetings/workshops during SIP/rule development.
- STAPPA/ALAPCO and EPA should identify additional financial and staff resources to help agencies develop, produce and disseminate appropriate tools that reach targeted audiences, with the goal of garnering public support for the SIP process.

**Feasibility:** It is likely that these recommendations will be implemented if expertise between federal, State and local agencies are shared. The STAPPA/ALAPCO Public Education and Communications Committee may be an appropriate group to coordinate this effort. EPA's role can include development and dissemination of outreach materials that are nationally applicable, as well as improving how information may be made available on its website.

**Timing:** As SIP development progresses, public involvement should be actively encouraged throughout the process.

**Resources:** Redirection of existing effort and personnel; additional resources should be considered as outreach planning intensifies.

**Priority Level:** Medium

**3.9 Co-Benefits of Innovative Measures:** *EPA and S/L/T should work collectively to communicate the co-benefits associated with innovative measures.*

**Background/Explanation:** The public is concerned with basic goals, such as improving public health and increasing economic and environmental benefits. When considering pollution control alternatives, broader support of a measure can be realized by determining and articulating the range of co-benefits provided by the measure. Overemphasis on receiving SIP credit for new and innovative types of pollution control initiatives limits public understanding and support for such initiatives.

**Recommended Actions:** In evaluating an innovative measure, or bundle of measures:

- EPA and States should communicate how proposed strategies and innovations would improve quality of life more generally.

**Feasibility:** This recommendation has a high feasibility for implementation because in August 2004, the EPA committed to continue to bring stakeholders from federal, State, local, and tribal agencies, the public, and the regulated community together for an annual Air Innovations Conference. The conference will highlight the benefits of new and innovative air quality projects going on around the United States and encourage dialogue among stakeholders.

**Timing:** It is anticipated that this recommendation can be implemented in 6-9 months as EPA has already committed to hold an annual Air Innovations Conference for the purpose of improving the dialogue among stakeholders.

**Resources:** Only minor redirection of existing efforts and personnel would be required.

**Priority Level:** High

**3.10 Innovative and Voluntary Measures:** *EPA should encourage States' and Tribes' efforts to implement innovative measures by providing enhanced flexibility, SIP/TIP credit guidance, technical support, and funding for innovative and voluntary programs.*

**Background/Explanation:** As areas continue to experience challenges in meeting air quality standards many still have to adopt and implement additional measures to meet the SIP requirements for attainment, reasonable further progress (RFP), rate of progress (ROP) or maintenance requirements. Some areas have implemented most available traditional emission control strategies and want to try new types of pollutant reduction strategies to attain or maintain the NAAQS. The EPA needs to continue to develop policy and technical guidance for the purpose of providing States and Tribes with the flexibility to test and use new and innovative emission reduction strategies in their SIPs/TIPs.

**Recommended Actions:** To continue to encourage, foster and support innovative and voluntary programs and measures in SIPs/TIPs, EPA should take the following actions:

- 1) EPA should clarify and expand the channels through which States and Tribes may gain SIP/TIP credit for innovative measures by issuing additional enabling guidance and by balancing the level of effort required for approval (recordkeeping, reporting, etc.) with the level of environmental benefits anticipated. EPA has begun this process by issuing new policy and guidance covering:
  - SIP credit for voluntary and emerging measures
  - SIP credit for energy efficiency and renewable energy initiatives
  - SIP credit for reductions in truck and locomotive idling emissions
- 2) EPA should create a clearinghouse for information on new technologies, innovative approaches, mentoring resources, and “off-the-shelf” measures, pilot projects, and quantification techniques. As an initial step, EPA is creating an interactive Innovations website to assist State/local/tribal governments in their efforts to implement innovative and voluntary programs.
- 3) Building off successful pilot studies, EPA should develop sector-based guidance that would synthesize and clarify innovative technological approaches to reducing pollution in the key sectors.
- 4) EPA should offer targeted funding to promote innovation. EPA has begun this process by providing funding for the following specific innovative projects: 1) Pollution Control Strategy Rapid Assessment & Optimization Tool (Response Surface Model) to provide state/local agencies accurate and economical tools for quickly determining the most cost-effective local strategies for meeting air quality standards; 2) Residential Wood Smoke Reduction Initiative; 3) grants for State/Local Innovative Approaches to Reducing Air Pollution; and 4) grant(s) for stationary diesel retrofit project.

**Feasibility:** This recommendation has a high feasibility for implementation because it can be completed under existing statutory authority and only requires that EPA continue to focus on providing responsive and timely guidance and technical support.

**Timing:** It is anticipated that this recommendation can be implemented in 6-9 months as many of the action items are already under development or consideration by the EPA.

**Resources:** Only minor redirection of existing efforts and personnel would be required as many of the action items are already under development or consideration by the EPA.

**Priority Level:** High

**3.11 SIP Credits for Bundled Innovative Measures:** *EPA should incentivize innovative pollution control strategies by offering SIP/TIP credit for “bundled and discounted” measures.*

**Background/Explanation:** States and Tribes are often discouraged from adopting innovative measures because those measures are typically too small-scale to result in significant SIP/TIP credit. In addition, results of those measures may be hard to quantify or verify individually. In the aggregate, however, such measures can significantly impact air quality. Currently, EPA has increased the amount of SIP credit States can earn for stationary voluntary and emerging (innovative) measures to a presumptive 6 percent through its latest guidance document on Incorporating Emerging and Voluntary Measures in a SIP (September 2004).

**Recommended Actions:** EPA should encourage States to experiment with new and innovative approaches to air pollution. Specifically, EPA should:

- Grant States and Tribes SIP/TIP credit upfront for a “bundle” of small, innovative measures and evaluate the measures in the aggregate by looking at air quality improvements after implementation. An appropriate discount factor should be applied to the credit, considering the amount of credit claimed and the level of uncertainty associated with quantifying the actual air quality benefits of the bundled measures.

**Feasibility:** This recommendation has a high feasibility for implementation because of EPA’s recent policy on “Incorporating Emerging and Voluntary Measures in a SIP” which enables a State to receive SIP credit for emission reduction or pollutant reduction measures which are more difficult to accurately quantify or enforce than traditional SIP emission reduction measures. However, any approval of “bundled” measures in a SIP will need to be conducted through full notice-and-comment rulemaking in the context of a particular state SIP revision.

**Timing:** It is anticipated that this recommendation can be implemented in 6-9 months as the overall enabling policy framework is now in place in the form of EPA’s recently issued guidance on “Incorporating Emerging and Voluntary Measures in a SIP.”

**Resources:** Only minor redirection of existing efforts and personnel would be required as a policy and guidance framework is already in place.

**Priority Level:** High

**3.12 Regional Approaches to SIP Planning:** *For many areas, planning for new SIPs or major revisions to existing SIPs for two or more separate nonattainment areas that are both part of the same regional scale air quality problem should be coordinated. If requested by a State, EPA should work with the different nonattainment areas, Tribes and combinations of multistate organizations and other stakeholders, as appropriate, to assist in the development of regional approaches to planning. This could include technical assistance such as modeling, national or regional control strategies, model SIPs, and model rules as templates for S/L/T adoption.*

**Background/Explanation:** The interstate transport of criteria pollutants and criteria pollutant precursors make State-by-State planning both impractical and ineffective. Moreover, even the appearance that neighboring States are developing SIPs regulating the same industrial sectors for the same pollutant(s) with differing levels of stringency quickly brings delays to the SIP/TIP development and adoption processes. The nature of many areas' 8-hour ozone and PM<sub>2.5</sub> problems increasingly call for the development and implementation of regional control strategies.

**Recommended Actions:**

- 1) Groups of States/Locals should redefine the role of existing Regional Planning Organizations (RPOs) and Multi-Jurisdictional Organizations (MJOs) to include supporting planning for all regional air pollution problems (e.g., 8-hour ozone, PM<sub>2.5</sub>, regional haze).
- 2) These organizations should amend their charters and by-laws as necessary for clarity of purpose and eligibility for additional grants.
- 3) These organizations should continue their established stakeholder involvement procedures in the development of model rules and model SIPs.
- 4) EPA personnel from multiple Regional Offices and OAR should review and comment upon model rules and model SIPs with an eye to their eventual adoption by State/Locals/Tribes such that any potential approval concerns are addressed up front.
- 5) In addition to model rules, RPOs/MJOs should develop standardized Technical Support/Analysis Documents for SIPs/TIPs being adopted by their member States/Tribes.
- 6) RPOs/MJOs should develop procedures for inter-RPO/MJO coordination to ensure consistency, as needed, in their air quality planning processes and comparability in their work products.
- 7) EPA should pursue discussions with OMB to ensure the flexibility of the use of grant funds allocated to RPOs/MJOs so they address multiple ambient air pollution problems as "one atmosphere" under a single grant such that the most scientifically valid and cost effective approaches can be studied and implemented.
- 8) The technical activities of RPOs/MJOs should be closely coordinated with the technical support activities and R&D programs of EPA.

**Pilot Studies:** Examine the benefits of the STAPPA/ALAPCO, OTC and WRAP model rules along with other model rules and SIPs developed by NESCAUM, LADCO, SESARM, VISTAs, CENSARA, CENWRAP, MARAMA, MANE-VU.

**Feasibility:** No statutory changes are necessary. Ease of feasibility is dependent upon the State/Local/Tribal desire to redefine/expand the role of RPOs/MJOs and to get charters and by-laws amended, as necessary.

Large neighboring groups of States/Locals/Tribes are already using RPOs to develop model SIPs and rules for regional haze. The successful efforts of the Western Regional Air Partnership (WRAP) for the regional haze SIPs under section 309 in the West and the Ozone Transport Commission for ozone SIPs in the Northeast are evident.

**Timing:** Should be implemented within one year to be effective for 8-hour ozone and PM<sub>2.5</sub>. EPA needs to work with OMB in the next budget cycle to pursue flexibility in the use of federal grants to RPOs/MJOs to work on multipollutant approaches to solving ambient air pollution problems.

**Resources:** The MJOs/ RPOs are already established. While negotiations and coordination between States/Locals/Tribes, Federal Land Managers and multiple EPA Regional Offices may initially take longer than each State only having to develop its own SIP internally, once procedures are established and schedules set, the time savings will be significant. The cost savings, particularly in the areas of emission factor and emission inventory development and modeling will be substantial. The regulated and environmental community and interested citizens would save resources by participating in the RPO/MJO stakeholder processes rather than having to spread themselves over each State's SIP development process.

**Priority Level:** High

**3.13 Federal and State Partnerships:** *EPA should participate with S/L/T in the SIP/TIP development process to identify and pursue emissions reductions from important source categories, especially those that only the federal government has the ability to address, such as federal and international sources. The level of control sought from these sources should be commensurate with their impact in the nonattainment area. As warranted by the nature of the source, control strategy development should be carried out by S/L/T working either directly with EPA or with EPA and other federal agencies. For attainment demonstration purposes, States should be able to take appropriate credit for anticipated reductions from these sources (whether the reductions from regulatory or incentive programs) so long as the control strategy and its anticipated impact are found to be consistent with EPA regulation and guidance.*

**Background:** States are generally unable to regulate emissions from sources under federal or international jurisdiction, and have limited ability to regulate other on-road and non-road sources. Such sources can be major contributors to the air quality problem in many nonattainment areas. Under the Clean Air Act, EPA is given authority to regulate new mobile sources and their fuels and is able to assist State and local agencies and Tribes in regulating existing mobile sources and in achieving the desired control from federal sources either through direct EPA regulation or by working with other federal agencies. Similarly, EPA has the ability to work with other parts of the federal government in seeking the control of international sources. Such emission controls can, as appropriate, take the form of the direct regulation of emitting sources, incentive programs to reduce emissions, international agreements and other forms. Under existing EPA guidelines all of these forms of emission reduction can be credited in SIPs.

**Recommended Actions:**

- 1) EPA should participate with State and local agencies and Tribes in the process of identifying and pursuing measures to achieve the emission reductions from national and international sources needed to attain the 8-hour ozone and PM<sub>2.5</sub> standards by the attainment dates in each nonattainment area.
- 2) Early in the SIP development process, EPA should consult with State and local agencies on preliminary emission targets for each federal sector, help develop options to achieve those reductions, and aid in providing estimated benefits for State use in draft SIPs for public review.
- 3) EPA should expedite the approval of new technologies such as retrofits and alternative fuel formulations that can be applied to existing fleets within a nonattainment area.
- 4) When assessing controls, EPA should consider cost-effective technologies proven to control similar sources not under direct federal authority.
- 5) In those cases where States have limited ability to control a category of sources, where such sources are a key part of the problem and where national programs are not feasible, EPA, working with State and local agencies and Tribes, should develop targeted strategies for affected nonattainment areas, including multistate or regional strategies.
- 6) For federal sources that EPA does not have the authority to control directly, EPA should work with other federal agencies (such as the Federal Aviation Administration) to secure significant near-term and long-term reductions.
- 7) EPA should negotiate with international standards-setting entities on actions to achieve the reductions necessary to meet the attainment targets for these sectors (i.e., the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO)).

- 8) EPA should pursue international agreements with neighboring countries to address international emissions outside States' jurisdiction.

**Benefits:** Identifying and pursuing the necessary emission reductions from national and international sources will help ensure that the public health benefits of national air quality standards are achieved and that States do not suffer the economically from sanctions due to failure to comply with SIP requirements.

**Feasibility:** This recommendation calls on EPA to more directly address the attainment needs of each area by becoming a fuller partner early in the planning process. Implementing some potential strategies would require actions or funding by other federal agencies or Congress, international organizations, and other countries.

**Timing:** Because States are already in the development process for 8-hour ozone and PM<sub>2.5</sub> SIPs, this activity needs to be initiated immediately.

**Resources:** EPA could use existing resources. EPA staff is already familiar with federal emissions sectors that could provide additional emission reductions. Additionally, States have established incentive programs that could serve as models for federal incentive programs.

**Priority Level:** High

**3.14 Weight-of-Evidence Demonstrations:** *In order to move beyond the current approach of relying on air quality modeling, EPA, in conjunction with S/L/T and affected stakeholders, should modify its guidance to promote weight-of-evidence (WOE) demonstrations for both planning and implementation efforts. In particular, these demonstrations should reduce reliance on modeling data as the centerpiece for SIP/TIP planning, and should increase use of monitoring data and analyses of monitoring data, especially for tracking progress.*

**Background/Explanation:** The current system is top-heavy on modeling for planning purposes (especially, the preparation of an attainment demonstration) and light on tracking progress. The NRC recommended that “a more useful approach would be to retain the attainment demonstration as a planning tool but to place greater emphasis on follow-up measures to track compliance and progress and on actions to be taken if compliance and progress are not satisfactory.” This recommendation will focus on defining a more effective use of technical tools for a performance-oriented air quality management approach, and recognizes that S/L/T need to accomplish this work with available resources. Enhanced tracking and ambient monitoring (to track progress) is a better use of resources than intensive local modeling.

**Recommended Actions:** To move beyond the current approach of relying on air quality modeling, the Work Group recommends the following actions

- 1) Planning efforts should incorporate a weight-of-evidence (WOE) approach to provide the most technically defensible basis for a control plan and to satisfy any statutory requirement for a demonstration of attainment. A WOE approach is especially important when the modeling shows that the area is projected to be either just above or just below the ambient standard. (It should be noted that the WOE demonstration, including the modeling, must be subject to public review as part of the SIP process.) The WOE approach should include the following three elements:
  - a) A prospective modeling analysis, performed in accordance with an EPA-approved modeling protocol. Modeling should be used to identify the appropriate control path. Unfortunately, over-reliance on modeling can produce unnecessary debates over technical details, which can hinder efforts in getting emission reductions and cleaning-up the air. EPA should work with S/L/T and affected stakeholders to modify its guidance to clarify the proper use of modeling and WOE for SIP planning.
  - b) Analyses of air quality data, including preparation of a conceptual/qualitative description of the area's nonattainment problem, examination of historical air quality and emissions trends, assessment of (incoming and outgoing) transport (e.g., trajectory analyses), and use of observation-based methods (e.g., receptor models, and indicator species and ratios).
  - c) Summaries of current actual and expected future year emissions by species (primary and secondary), by year (base year, attainment years, and appropriate interim years), and by source sector. Assumptions used in projecting emissions growth must be well documented.
- 2) Implementation efforts (i.e., periodic progress assessments) should consider similar WOE elements, including:
  - a) A retrospective modeling analysis (as necessary) to assess progress in meeting air quality standards and visibility goals.
  - b) Analyses of air quality data, including examination of recent (meteorologically adjusted) air quality trends and emissions trends.

- c) Summaries of actual emissions by species (primary and secondary species), by year (base year, attainment years, and appropriate interim years), and by source sector. Assumptions used in projecting emissions growth must be well documented.
- 3) To assist S/L/T with these planning and implementation efforts, EPA should issue WOE guidance, which clarifies the proper role of modeling for SIP planning, establishes standard WOE procedures (e.g., when WOE considerations are appropriate, how to ensure that use of WOE is a symmetric process, and how to determine what additional evidence should be considered and how it should be used), and identifies appropriate data analysis methods (e.g., methods for estimating statistically significant trends which account for meteorological effects).

**Benefits:** Better use of modeling and monitoring data can provide a sounder basis for control strategy development, and allow better tracking of compliance and progress.

**Feasibility:** All the technical tools are available for performing the necessary modeling and data analysis activities, including work being performed by the RPOs and MJOs. The bigger issues are likely to be the availability of sufficient air quality measurements, and the staffing/resources needed to conduct these analyses. The EPA guidance should address the tools/methods, as well as the data requirements and personnel needs.

**Timing:** Given the potentially large scope of this recommendation, it is important to break the analyses into pieces and assess the time required to complete each of them. A workshop with all interested parties should be held to develop further this recommendation. Once there is a general framework of what is to be done and the data needed to support that framework, the guidance for addressing the other activities can be prepared.

**Resources:** To conduct such extensive analyses, a wide variety of experts will be required (e.g., statisticians, meteorologists, air quality data analysts, emissions inventory experts). In addition, someone with the ability to put the analyses into concise wording will be needed to communicate the findings. Up to 4-5 FTEs that have the skills outlined above, as well as contract funds (e.g., \$50K for workshop and follow-up actions) is estimated to develop appropriate guidance. Resources for training for S/L/T personnel are also needed.

**Priority Level:** High

**3.15 Periodic Assessments to Track Progress:** *S/L/T and EPA should conduct periodic assessments to ensure that areas are on track to meet NAAQS, air toxics, and visibility goals, and make mid-course adjustments, as necessary.*

**Background/Explanation:** One of the long-term objectives identified by the NRC is to guide future improvement of the air quality management system is to take a performance-oriented approach. This approach would emphasize “performance rather than the process” and would “create accountability for achieving results.” The NRC recommended that “a more useful approach would be to retain the attainment demonstration as a planning tool but to place greater emphasis on follow-up measures to track compliance and progress and on actions to be taken if compliance and progress are not satisfactory.” This recommendation will focus on tracking progress and what to do if areas are not on track to meet NAAQS, HAP, and visibility goals. The previous recommendation (3.14) addressed the definition of a more effective use of technical tools for a performance-oriented air quality management approach.

**Recommended Actions:** To begin to lay the foundation for a performance-oriented approach, the Work Group recommends the following actions:

- 1) States and EPA should work together on tracking progress, including a review of changes in actual emissions and air quality concentration, as described in Recommendation 3.14. In particular, a comprehensive progress report should be prepared, which compares actual progress with expected emissions and air quality trends for each metric (see Recommendation 1.5). Further discussion is needed to determine the appropriate frequency for this report.
- 2) If actual progress differs “substantially” from the expected trend for a given metric, then States should reexamine effectiveness of that attainment measure. If attainment will be later than the statutory attainment date, then the State should determine whether it is necessary to modify the SIP. Note, this determination should consider the influence of weather conditions (e.g., very hot/cold, or very wet/dry conditions).
- 3) EPA should report annually on health and ecosystem impacts (i.e., indicators and benchmarks established pursuant to Recommendation 1.5). Also, EPA should report annually on major control programs that they are coordinating (e.g., Title IV and NOx SIP Call).

**Benefits:** On-going progress assessments will ensure that the correct and most cost effective control strategies are in use. Joint State-EPA efforts should allow more effective use of available resources and eliminate any redundancy in current efforts. Such comprehensive analyses can also highlight limitations in existing data systems which would facilitate appropriate data quality improvements (emissions, modeling, and monitoring).

**Feasibility:** This activity is a logical extension of EPA’s annual Trends Report, and State RFP and air quality assessments. Additional EPA and State staffing may be needed to ensure proper interagency coordination. Refinements to existing tools will be needed (such as improved adjustments for meteorology) some of which are already in development by EPA.

**Timing:** Initial products could be expected within 1-2 years. A fully integrated State-EPA analysis and report system may take several years.

**Resources:** EPA should bear the primary responsibility. Approximately 2-3 new FTE's and \$300K per year may be needed.

**Priority Level:** High

**3.16 Averaging, Banking and Trading in Gasoline Sulfur Program:** *EPA should evaluate the averaging, banking, and trading (ABT) provisions included in the Tier II gasoline sulfur regulation to see if they are effective.*

**Background:** Averaging, banking, and trading (ABT) provisions have been widely used in EPA regulatory programs to provide flexibility to industry while aggressively attacking environmental problems. The effectiveness of these provisions for fuels programs should be evaluated, since ABT concepts are being built into new regulatory programs.

**Recommended Actions:** EPA should evaluate the ABT provisions in the gasoline sulfur program as the program rolls out over the next few years. The evaluation should be phased to include annual analysis of available information and a complete report when the program has been fully implemented and patterns of credit usage are well-established. Below is a list of topics that would be covered by the evaluation:

- *Credit accumulation:* Did the credit generation opportunity result in substantially lower sulfur levels in 2002 and 2003? What volume of credits were generated and how much flexibility did this make possible to refineries? How was credit generation distributed across the industry?
- *Allotment accumulation:* Did facilities and companies take advantage of the allotment generation opportunity in 2003–2005? What volume of allotments was created, and how much flexibility is thus available to refining companies?
- *Trading and markets:* (Separately for credits and allotments) How much trading took place relative to the total volume of credits/allotments? How efficiently did the credit/allotment markets function? Were credits and allotments readily available for purchase by challenged facilities and companies? How much trading of credits was inter-company (as opposed to trading between facilities within the same company)? How did the price of credits/allotments vary over the course of the program? How was the trading system perceived by refiners?
- *Role of allotments in compliance with Corporate Average Standard (CAS):* To what extent did active trading of allotments contribute to companies' ability to comply (use of purchased versus self-generated allotments)? How did CAS compliance strategies vary across the industry (uniform reductions across facilities versus planned unevenness in facility reductions)? How many allotments were retired?
- *Role of credits in compliance with Refinery Annual Average Standard (RAAS):* To what extent did facilities use credits to come into compliance with the RAAS? What proportion of the credits used in compliance were purchased rather than self-generated? How many credits were retired?
- *Reporting system's accuracy:* Does accuracy of reporting indicate industry understanding of ABT program? Do most reports of credit/allotment trades match up without EPA intervention or troubleshooting? Do refiners perceive the ABT system as logical and workable in practice?

EPA should consider conducting a similar analysis for ABT when it implements the diesel sulfur program.

**Feasibility:** This recommendation is generally very feasible. Existing EPA staff can perform these analyses and write the final report. Possible obstacles include difficulties in enlisting

cooperation from industry sources, and the need to work around confidentiality concerns with both reporting data and information obtained from confidential conversations.

**Timing:** Some aspects of the evaluation can be addressed in annual analyses beginning in mid-to-late 2005. The more complete report on this effort cannot be developed until late 2007 at the earliest, the first time data on a fully-implemented program will be available.

**Resources:** This evaluation will require less than one FTE for each report. Some contractor time will be required to program certain analyses.

**Priority Level:** Low

**4.1 SIPs to Address Multipollutant Impacts:** *For the SIPs States are required to submit over the next several years, EPA and S/L/T should promote the consideration of multipollutant impacts, including the impacts of air toxics, and where there is discretion, select regulatory approaches that maximize benefits from controlling key air toxics, as well as ozone, PM<sub>2.5</sub> and regional haze.*

**Background:** The SIP process provides an opportunity for many urban areas to include key HAPs in a comprehensive multipollutant approach to air quality management, consistent with the NRC recommendations. The NRC recommends (on p. 298 of *Air Quality Management in the United States*) that:

EPA, States and local agencies should identify key HAPs that have diverse sources or substantial public health impacts or both, which would merit their inclusion in an integrated multipollutant control strategy (for example, benzene).

Activities have been taken at the State/Local/Tribal and federal level to reduce emissions from key HAPs. It is important to clarify that this NRC recommendation should not be interpreted as deferring federal responsibilities (e.g., mobile source air toxics program, 112(k) area source program, etc) to State and local agencies. Rather, this recommendation means that the air quality management process being undertaken for SIPs/TIPs provides an opportunity to see how State/Local/Tribal and federal efforts are working to reduce key HAPs, to identify what actions could be taken at the State and local level to supplement current efforts, and to help identify priorities for federal actions.

**Recommended Actions:** EPA, in consultation with states and stakeholders, should develop a “short list” of critical HAPs that pose the highest risk to human health in urban areas. Likely compounds for consideration on the short list would include:

- benzene and acrolein: these are national risk drivers in EPA’s 1999 national air toxics assessment (NATA).
- diesel PM: although not a “HAP” listed specifically in the Clean Air Act, the workgroup recommends it for consideration on the short list.

The following additional steps should be taken to finalize the short list:

- 1) EPA and States/Locals/Tribes should identify additional HAPs which are likely due to ubiquitous sources for inclusion into the list of “key HAP”. For example, the following were identified in the 1999 NATA as contributing to more than 90% of the cancer risks in 531 proposed or final nonattainment counties:
  - Ethylene dibromide
  - Butadiene
  - Acetaldehyde
  - Bis 2 ethylhexyl pthalate (DEHP)
  - 1,1,2,2, tetrachloroethane
  - Chromium VI
  - PAHs

- Napthalene
  - Tetrachlorethylene
  - Ethylene dichloride
- 2) EPA and States/Locals/Tribes should review HAP monitoring results to identify any high-risk pollutants which may be underpredicted by the NATA.
  - 3) States/Locals/Tribes should include on the list any additional HAPs which are high risk in their area.

For the “short list,” EPA should encourage States and Tribes, in developing their SIPs/TIPs for PM<sub>2.5</sub>, regional haze and ozone, to evaluate opportunities for achieving co-benefits through simultaneous reduction of these key “urban risk driver” HAPs.

EPA, working with one State and a short list of HAPs, should develop and test a model integrated SIP as a pilot project before expanding to other States/Tribes. Possibly good candidates for such a pilot, areas which are both ozone and PM nonattainment, and which are part of the national air toxics trends sites (NATTS) network include: Detroit, St. Louis, Atlanta, and Chicago.

**Feasibility:** Including a short list of HAPs in modeling and control strategy analyses for SIPs/TIPs should not add substantially to the resource burden. Results for the HAP “short list” could readily be derived from existing ozone or PM modeling. Control strategy analysis would be somewhat more complex, but would benefit from a more thorough evaluation of multi-pollutant interactions.

**Timing:** In order to extend this approach to the additional areas that will be submitting PM and /or ozone SIPs, the pilot effort would need to be complete by the end of calendar year 2005.

**Resources:** For EPA, this effort could be completed with redirection of existing personnel without a substantial additional financial commitment. For States, this might add perhaps 10-20% to the cost of the SIP analytical effort.

**Priority Level:** High

**4.2 Multipollutant Benefits and Disbenefits in Standards Setting:** *EPA should explicitly outline and quantify multipollutant benefits and disbenefits when setting emissions standards.*

**Background:** The current statutory, regulatory, and policy framework does not explicitly provide an integrated approach for the consideration of criteria and air toxics. An opportunity exists in the ongoing air toxic standards-setting processes (e.g., remaining MACT standards, residual risk, and area source standards) to explicitly consider multi-pollutant effects of proposed control strategies in selecting options.

**Recommended Actions:**

- EPA, in conducting engineering reviews to support emissions standards efforts, should assess how identified options for Hazardous Air Pollutants (otherwise known as HAPs or air toxics) reduce and/or increase direct PM<sub>2.5</sub> emissions, and emissions of PM and ozone precursors such as VOC, NO<sub>x</sub> and SO<sub>2</sub>.
- Engineering reviews for HAP standards should catalog available control options that would reduce direct PM, SO<sub>2</sub>, VOC and NO<sub>x</sub> emissions even if those options would not reduce air toxics.

**Feasibility:** The recommendation to quantify the benefits and disbenefits has a high feasibility for implementation, although the degree to which they can be considered is not clear under existing statutory authority. Section 112 (d)(2) of the Clean Air Act explicitly states that emission standards for HAP should consider non-air quality health and environmental impacts, but it doesn't appear to preclude consideration of other air quality impacts. Regardless of a change in statutory requirements, quantifying criteria pollutant benefits will result in better decision-making and will boost overall acceptance of future MACT requirements.

**Timing:** It is anticipated that this recommendation to quantify the multi-pollutant benefits and disbenefits can be implemented immediately in ongoing development of remaining MACT standards, MACT residual risk 112(d)(6) standards, and 112 (k) area source standards.

**Resources:** This effort will require some additional analyses in the MACT development process, but we would not expect substantial additional financial commitments.

**Priority Level:** High

**4.3 Greenhouse Gas Emissions:** EPA should assist States and localities in quantifying the potential increases or decreases in greenhouse gas (GHG) emissions from reduction measures primarily designed to address ozone, fine particles, regional haze, and air toxics.

**Background/Explanation:** A number of States and localities have adopted policies to assess and/or reduce GHG emissions from certain source categories under their jurisdiction. A number of these source categories emit criteria and toxic air pollutants. To assist those States and localities wishing to consider multiple emissions implications of alternative strategies, EPA should help determine how pollution control alternatives that are being examined to address ozone, fine particles, regional haze, and air toxics might either increase or decrease emissions of GHG emissions. States would then have the option to consider multiple emissions impacts in assessing a list of proposed alternative measures. Tools for evaluating impacts are available, including STAPPA and ALAPCO's Clean Air and Climate Protection Software (CACPS).

**Recommended Actions:** In evaluating emissions control measures, EPA should assist States and localities in the quantification of potential increases and decreases in GHG emissions.

**Feasibility:** Quantifying the impacts of control strategies on GHG emissions is feasible; a number of existing tools (i.e., CACPS) already do this. If "co-benefits" were to mean modeling of the impacts of such increases and decreases on climate change, this would be far less feasible.

**Timing:** Implement over the next few years.

**Resources:** Implementation would require a relatively small increase in resources for EPA to support the existing toolkit (CACPS) that STAPPA/ALAPCO already has developed. State/local resources would be affected only for States/localities choosing to use this information.

**Priority Level:** High

**5.1 Program Review to Improve Ecosystem Protection:** *EPA should, in parallel with recommended scientific and technical work, begin now to examine current and alternative clean air related policies and programs to develop approaches that would advance protection of ecosystems from the adverse effects of air pollution. Alternatives that should be evaluated include a regional cap-and-trade program, protection of ecosystems based on critical loads, and a State-wide planning program for protecting and enhancing air quality in areas that attain the NAAQS (including National Parks and Wilderness Areas).*

**Background/Explanation:** The NRC stated that the system of air quality management in the United States does not go far enough in protecting ecosystems and other aspects of public welfare from the impacts of air pollution. The NRC noted specific policy-related deficiencies in secondary standards, tracking of ecosystem outcomes from air quality changes, and accounting for ecosystem effects in cost-benefit analyses.

**Recommended Actions:** To advance and support future policy decisions, it is important to implement the recommendations of the science and technology subgroup regarding developing innovative benchmarks and measures to assess ecological impacts of air pollution and improving ways to track and evaluate progress in reducing those impacts. The examination of potential policy alternatives does not, however, need to be delayed while these advances are being developed. We have substantial information on direct and indirect effects of some air pollutants on the environment amassed in criteria documents, and assessments such as that of the National Acid Precipitation Assessment program. This information can assist in framing policy questions and approaches in an exploration of how current and future information might be used to increase environmental protection. This effort should be interactive with those groups who are working on the scientific and technical recommendations.

Specifically, EPA should, in conjunction with other interested parties, begin with an assessment of the relative effectiveness of major clean air programs under the CAA in terms of their potential to provide additional ecosystem protection.

Recognizing that regulatory programs are in different stages of implementation and offer different options, EPA should consider the following in the review of each program:

- a) policy mandates, objectives, goals, definitions of ecosystem protection, historic/legal interpretation
- b) characteristics of air pollutant(s) regulated (e.g., toxics, criteria, mobile), may have different potential magnitudes of impact (e.g., different temporal/spatial scales)
- c) existing reporting measures of program/ecosystem protection progress (e.g., trends report, acid deposition goals under GPRA and PART, NAPAP Report to Congress, EPA's Report on the Environment, water quality measures, inclusion in regulatory impact analyses etc.)
- d) whether existing tracking efforts need modifications to specifically support their use in different regulatory programs (i.e., networks needed to support secondary standards vs. other CAA mechanisms, national vs. critical ecosystem coverage, etc.)
- e) current and future opportunities or impediments to expand use of ecological science in the policy context, given additional ecological research, indicator/ model/monitor development, consistent longer-term measurements/monitoring.

- f) what policy innovations/revisions would be required to better translate ecosystem science into effective ecosystem protection policies.

The policy assessment of air pollution and ecosystem protection should also consider non-regulatory programs, including ongoing innovative approaches that examine multi-media approaches to integrating air pollution effects with other ecological concerns, as is done in the Sustainable Environment for Quality of Life (SEQL) project in Charlotte.

**Benefits:** This recommendation will accelerate consideration of ecosystem protection in clean air programs as well as ensuring faster application of recommended enhancements to EPA's scientific and technical assessment capabilities as they are developed

**Feasibility:** This recommendation is highly feasible and the work can be completed under current Clean Air Act authority. The exercise could, however, identify impediments or desirable policy approaches that are not currently available.

**Timing:** The recommended policy assessment of current programs could begin immediately. The potential for developing new policy approaches would depend on the results of the activity. If the scientific and technical recommendations are adopted, improved tracking could begin in the near future. Longer-term consideration would be needed to determine whether current and/or additional technical information/tools under development could be applied more formally under the Clean Air Act.

**Resources:** Additional staff resources in the Office of Air and Radiation would be needed.

**Priority Level:** High

## **Appendix C: Summary of Unresolved Issues For Further Discussion**



## Appendix C: Unresolved Issues for Further Discussion

Listed below, with brief descriptions, are several recommendations that the AQM Work Group considered but decided against advancing in final form at this time. There were various reasons why these recommendations were deferred for further discussion: some recommendations were added to the discussions late in the Work Group's process; others are so complex that they require additional data and evaluation before they can be finalized; others are controversial and require further discussion among stakeholders. This list does not include every issue considered by the Work Group, but contains the issues that were considered most important to advance for further discussion.

- 1) **Emissions Inventories:** EPA should improve the process for developing national, State, and local emissions inventories.

Currently, States are required to prepare a comprehensive statewide inventory every three years, pursuant to EPA's Consolidated Emissions Reporting Rule (CERR). EPA prepares its National Emissions Inventory (NEI) using these State inventories and other information. The timeliness and quality of these State and national inventories should be improved. For example, EPA should consult with States to determine which source categories can be inventoried more frequently (ideally, annually), such as EGUs, and EPA should work with a few States on a pilot project to develop more efficient ways to prepare the NEI (e.g., examination of top-down (national-level) and bottom-up (state-level) approaches, and streamline the reporting of State data and EPA's processing and compilation of these data).

- 2) **Monitoring Networks:** EPA and States should work together to increase the number of air quality monitoring stations and improve their distribution.

To improve spatial coverage and comprehensiveness in existing State and federal monitoring networks, additional monitoring sites and additional measurements are desired. The first step in making improvements is to conduct spatial analyses of existing monitoring networks and identify "gaps" in coverage. Based on results of the spatial analyses, EPA Regional Offices and States should work together to establish appropriate monitoring sites. Possible enhancements include increased sampling in rural areas (to promote ecosystem goals) and reallocation of PAMS monitoring to ensure a Type II site in as many 8-hour ozone nonattainment areas as possible (to promote tracking progress). To ensure that monitoring networks are providing usable data, States should conduct a thorough assessment of their monitoring networks every five years.

- 3) **Short-Term Monitoring:** States should consider conducting short-term monitoring programs.

To complement on-going monitoring efforts (especially, to address particular air quality problems and issues), special (short-term) field programs should be considered. Examples of such field programs include summertime ozone field programs (e.g., SCAQS, LMOS, and NARSTO-Northeast) and investigative studies (e.g., MRPO's urban organics study).

- 4) **Evaluation of Models:** EPA should support the evaluation of air quality models.

To develop confidence in using models for regulatory purposes, it is important first to evaluate the models by comparing model estimates and ambient measurements. EPA should publish a report every three years on the state-of-the-science for ozone, fine particle, and haze modeling. The report should include any current model-evaluation studies, and assessments of special issues (e.g., model predictive capability of changes in air quality concentrations due to changes in emissions, predictive capability of models at very low concentrations, effect of model grid resolution on predicted concentrations, and suitability of using point measurements for comparison with modeled concentrations). On a larger scale, a measurement plan should be prepared for a regional (or sub-regional) field program in the eastern half of the U.S. to support ozone, fine particle, and haze models. Note, resources for a meaningful field study may approach a million dollars. Further discussion is needed to address the scope, cost, and funding options for such a major study.

- 5) **Evaluation of Control Measures:** EPA should conduct retrospective evaluations of control measures.

The NRC recommendations note that programs to systematically collect information on what has worked (and how well or not so well) have been inconsistently funded and have been limited in ability to independently validate user's estimates of compliance costs. Even though NRC's emphasis above is only on costs (evaluated retrospectively), it seems equally important to evaluate technical experience/feasibility with various technologies. As such, it is recommended that EPA undertake written case studies in consultation with the affected industries of cost and technology experience of representative stationary source and mobile source categories (e.g., EGU NO<sub>x</sub> and SO<sub>x</sub> control, non-EGU NO<sub>x</sub> controls, motor vehicles fuels and emission standards, and mobile source retrofit programs).

- 6) **Communication of Technical Information to Policymakers:** The scientific community, both within EPA and outside the agency, should work to improve the communication of technical information to policymakers.

Technical analysts often generate complex, highly scientific information to address air quality problems. Communicating this information to policymakers and others who may not have the same technical background is a challenge. As such, it is necessary for technical analysts to be clear, objective, and relevant in presenting this information to policymakers, and for policymakers to be willing to be receptive to technical information.

- 7) **Multipollutant Modeling:** EPA should promote the use of multipollutant models.

EPA and States should use air quality models capable of addressing ozone, fine particles, regional haze, and air toxics (e.g., mercury) in the upcoming round of SIP development. Viable candidate multi-pollutant models include CMAQ (developed by EPA's Office of Research and Development (ORD)), CAMx, and REMSAD. Although no endorsement of these models is offered, it should be noted that CMAQ and CAMx appear to reflect the most up-to-date science. As these models advance, the transition from research to application needs to be improved. For example, EPA's ORD and Office of Air Quality Planning and Standards should make sure that CMAQ is usable (in-house) by RPOs/states for SIP modeling.

- 8) Integration of Programs for Criteria Pollutants and Air Toxics:** EPA should investigate technical considerations associated with the potential integration of programs to control criteria pollutants and air toxics.

The NRC, recognizing the long standing difference in the way criteria pollutants and toxic air pollutants are regulated under the Clean Air Act, while also recognizing that in the air they mix to form one atmosphere, recommended an evolution toward a common risk based approach to regulating emissions of air pollutants and providing clean air. Setting aside the policy and program issues, there are fundamental science hurdles that must be overcome to weigh the options and alternative approaches in moving toward such a “one-atmosphere” approach to providing clean air (e.g., dealing with large differences in the amount and quality of data on emissions, ambient levels, personal exposures and environmental deposition, health and ecosystem effects, thresholds, and risk factors for these many chemicals). What is needed initially is a first order relative risk assessment and gap analysis based on currently available information using existing practices. Ultimately gaps would be filled and protocols.

- 9) Integrated Criteria/Toxics Controls at Individual Sources:** Consistent with the goal of controlling more air pollutants in a holistic fashion, States/Locals/Tribes should be encouraged to address emissions from criteria pollutants and air toxics concurrently during permitting or regulatory actions at individual sources.

The group believed that this recommendation had possible merit. However, the recommendation was drafted late in the process and the group did not have adequate time to consider it in detail.

- 10) SIP Consistency Process:** EPA should better document its internal processes to ensure transparency in evaluating S/L/T or regional requests for a variance from published policies.

The Group believed that this was an important recommendation. However, there was a general lack of understanding outside of EPA as to how EPA’s internal process works to ensure consistency in decisions across the different Regions. EPA agreed that such policies need to be better documented and explained. However, there was insufficient time to do so, so the recommendation was deferred for further discussion.

- 11) Electric Generating Units:** The electricity generating unit (EGU) sector makes a large contribution to multiple air quality problems. Many believed that the active rulemaking underway on the Clear Air Interstate Rule (CAIR) provided the proper forum for considering what this sector ought to do for the next 15 years or more; others did not. Since no agreement could be reached on a recommendation regarding this sector, the Work Group recommends that discussions continue by the new CAAAC subcommittee. Regardless of the outcome of any future discussions, many of the stakeholders involved saw considerable value in State and Local agencies and utilities consulting with each other after final promulgation of the CAIR (or new legislation) to share compliance plans, evaluate likely emissions reductions and their geographic distribution, and apply that information to further planning activities.



# **Appendix D: Letter Transmitting Final Report to EPA**



## Appendix D: Letter Transmitting Final Report to EPA

Honorable Michael O. Leavitt  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Ave N.W.  
Washington, DC 20460

Dear Administrator Leavitt:

On behalf of the Clean Air Act Advisory Committee (CAAAC), we are pleased to present to you a report and list of recommendations from the Committee for your consideration. CAAAC is a senior-level committee consisting of senior managers and experts representing state and local government, environmental and public interest groups, academic institutions, unions, trade associations, utilities, manufacturing industries and others. The Committee provides advice and counsel to EPA on a variety of important air quality issues.

In 2004, the National Research Council (NRC) of the National Academies released a report entitled *Air Quality Management in the United States*. In this report, the NRC outlined the many substantial achievements of the U.S. air quality management system over the past 30 years. The NRC also identified areas where changes in the air quality management (AQM) system would provide further benefits to human health and the environment. The NRC advanced recommendations for change in the AQM system on a number of levels. Some of the NRC's recommendations involve short-term changes of limited scope and immediate impact. Other NRC recommendations focus on more sweeping changes to the nation's approach to AQM over the mid- to long-term.

For the past six months a CAAAC Work Group has evaluated ways to improve the current air quality management system in this country. The recommendations of the NRC helped guide this Work Group. On December 16 the Work Group advised the CAAAC about the desirability and feasibility of implementing a number of near-term recommendations to improve the current system. The AQM Work Group included representatives from State and local organizations, Tribes, regional organizations, environmental and public health organizations, industry and EPA. This report outlines near term recommendations for improvements in air quality management in the United States and also proposes a continuing process for discussion of longer term changes. It focuses on translating the relatively broad NRC recommendations into specific and concrete steps that can be taken quickly by EPA and others to realize improvements in science, technology, policy, and planning that will lead to improved air quality and public health protection

While the CAAAC reached consensus on forwarding the recommendations for further examination by EPA, individual members were also given an opportunity to submit additional comments on the recommendations. Comments submitted in writing by CAAAC members are included as an appendix of this report. CAAAC does recognize that there are potential resource implications associated with some of these recommendations for EPA and its partners in air

quality management. The CAAAC hopes that resources can be made available to implement these recommendations appropriately.

On behalf of the Committee, we thank you for the opportunity to participate in EPA's activities and hope our advice is useful in developing air quality management strategies.

Sincerely,

Janet McCabe, Co-Chair  
Air Quality Management Work Group

Gregory Green, Co-Chair  
Air Quality Management Work Group

Jeff Holmstead, Chair  
Clean Air Act Advisory Committee

# **Appendix E: Commentaries from Clean Air Act Advisory Members**



## **Appendix E: Commentaries from Clean Air Act Advisory Members**

At a meeting of the Clean Air Act Advisory Committee on December 16, 2004, the Air Quality Management Work Group presented results of its efforts to assess the recommendations made by the NRC on air quality management in the United States. The Work Group presented 37 recommendations for the CAAAC's consideration. The CAAAC agreed to forward those 37 recommendations and requested the Work Group to include the recommendation on green-house gases for future consideration by EPA. At the request of the CAAAC, the Work Group has modified the report to include the greenhouse gas recommendation (see Recommendation 4.3) and has added language to the report to emphasize the goal of public health and ecosystem protection. In addition, the CAAAC emphasized the need to label the Work Group's initial effort and this report as "Phase 1" since there are remaining issues to be resolved and discussions needed on the longer-term vision and air quality management framework of the future. The CAAAC conferred and as a group agreed to deliver the final report to EPA for its consideration.

Following the December 16, 2004 meeting, members of the CAAAC were asked to submit any comments in writing to the Work Group on the individual recommendations. Contained in this appendix are the comments received from seven organizations. Many of these comments are directed at future issues and will be discussed as part of Phase 2 follow-on efforts.

Comments are included from the following:

William W. Goldsmith, Cornell University  
Ralph Marquez, Texas Commission on Environmental Quality  
Steve Winkelmann and Ned Helm, Center for Clean Air Policy  
Kenneth Coburn, Northeast States for Coordinated Air Use Management  
Charles Collett, National Association of Home Builders  
Christopher Recchia, Ozone Transport Commission  
J. Stephen Hartsfield, National Tribal Air Association

December 17, 2004

Dear Greg, Janet, Rob, et al:

To begin, thanks again especially to Greg and Janet and members of the AQM sub-committee for the very high quality – if perhaps timid or incremental – report on AQM. Although I offered my suggestions at the CAAAC meetings Wednesday and Thursday, with general agreement from the committee, I will repeat them below in writing, as friendly amendments to the report.

Respectfully,

William W. Goldsmith

*1. The report needs to state prominently – in its Executive Summary (ES) and Introduction – that it proposes air quality management (AQM) improvements in pursuit of lower emissions and better air quality (AQ) for improved protection of human health and national and regional ecosystems.*

The draft Executive Summary (ES) and Introduction that you presented to the CAAAC, do not provide this emphasis. Instead, they emphasize “the dramatic improvements in AQ . . . since 1970.” The wording of the ES and Intro might lead an uninitiated reader to conclude that AQ has been sufficiently improved already, so that to fix the its machinery EPA need only to tighten some screws, adjust some valves, and oil some joints – to make “improvements in efficiency and effectiveness of current programs,” as the ES says (p. vi).

Presentations by the report’s authors and many spoken comments from CAAAC members were much more forthright about the remaining need for improvements in AQ, in spite of the dramatic improvements we’ve had since 1970. Reports on details of the sub-committee discussions, comments from CAAAC members, and responses from sub-committee and EPA leaders left no doubt – the objective of the report is to make management more efficient and effective so as to further reduce emissions and therefore further improve AQ, in pursuit of improved human health and ecosystem quality.

As it stands in the draft, the ES emphasizes “transformation of the AQM system,” calls for EPA to “improve the US AQM system,” wants changes “to allow progress to continue in a more effective and efficient manner,” and calls for EPA to “streamline processes, improve resource allocation, and enhance scientific and technical capacity.”

The Introduction, after documenting “dramatic declines in emissions and . . . pollutants,” focuses again on efficiency and effectiveness,. The Intro does say AQ improvements can “be . . . expanded,” and that “the AQM system could . . . provide further benefits, but it imbeds these goal statements in discussion of management efficiency and effectiveness, rather than stating them as independent goals.

*2. The report should strengthen its comments on conformity.*

The report should call for intensified effort to analyze relationships connecting human health and ecosystem quality with the metropolitan nexus of AQ, transportation, and land use. Problems in this area – now so frequently discussed in the public arena under such rubrics as sprawl and smart growth – are getting worse, not better. AQ damages are “transported” beyond the metro areas, to include, e.g., tribal areas. Conformity provisions are badly needed and must be retained, as the report says, but they have not yet worked adequately, so the report should call for them to be improved and strengthened.

*3. Changes are required in reporting three of the issues that have been placed in the so-called Bin Two (i.e., left to be considered for future recommendations from this or other subcommittees of the CAAAC).*

- a) Long-term principle #7 (p. 34) should be changed to read: *Further incorporate land use and transportation planning in clean air planning efforts.*
- b) The discussion in Section 2.1.3 (p. 21 and Appendix p. 48) must include language indicating that transportation plans can achieve adequate AQ improvements only if they are integrated adequately with improved land use plans. Thus, a fourth Recommended Action should be added (Appendix, 2.1.3, p. 48,) as follows:
- c) 4) EPA should work with COGs, MPOs, and other involved agencies of S/L/T governments to facilitate better AQ results through reduction of urban sprawl and consequent reductions in VMT and energy use. EPA should work with DOT, HUD, and other federal agencies to seek improved land use and transportation plans and enhanced coordination among highly interdependent jurisdictions.
- d) The listing of deferred “Issues” (Appendix C, p. 86 ff.) should be amended to include all the issues listed as “Core Principles” (Report, p. 34).

The Report’s “Long-Term Core Principles” and Appendix C’s “Summary of Deferred Issues” leave the reader confused. The section on Long-Term Framework Options,” at the end of the Report, adds to this confusion. The general idea, made clear in the discussion, is that a number of items/issues were left for the future, either because they were added too late, are too complex, or are too controversial. The two lists should be made compatible.

*In particular, whether or not other changes are made, Core Principle #7 (on land use and transportation planning) needs also to be listed as a separate item in Appendix C.*

January 4, 2005

Comments from:

Ralph Marquez, Commissioner,  
Texas Commission on Environmental Quality

The primary points Commissioner Marquez would like to reiterate are:

- 1) The report's recommendations mention in a number of places the need for increased regional approaches to addressing the air quality needs. However, the report does not adequately address the tension which currently exists between EPA's desire for national consistency and the flexibility needed to adequately craft the necessary regional approaches. EPA needs to recognize this tension and take the appropriate steps to mitigate it.
- 2) There are a couple of recommendations which refer to the need for EPA to issue timely guidance. However, the report does not adequately address the disincentives, associated with draft and evolving guidance, which currently preclude S/L/T's from developing unique approaches to address their particular issues. EPA should stop the bureaucratic terrorism and not hold up innovative and unique approaches solely because they may not be consistent with future guidance.
- 3) The report is very weak on the need for increased accountability associated with EPA's role in the process. Specifically, there is too much focus on the need to evaluate additional controls on source categories which State's currently have a significant amount of authority to regulate. EPA needs to focus those resources on what should or could be done to address those categories where State's have little to no authority. For example, EPA should focus on getting new technologies approved and into the market, especially for mobile sources, in a timely enough manner that they will be available for this next round of SIPs. EPA should also consider stepping up and assuming a federal assignment up front in the planning process, for achieving reductions from these categories.

There are over 37 recommendations included in the report, with a number of sub-recommendations. If EPA were to attempt to implement them all, other important programs and initiatives could suffer. EPA needs to step back and conduct a holistic evaluation of all of its current efforts, and identify those activities which could be delayed or eliminated, to ensure adequate resources are available for the timely implementation of these initial recommendations.

To: Air Quality Management Work Group

From: Steve Winkelman and Ned Helme  
Center for Clean Air Policy

Re: CCAP Comments on the AQM Work Group Final Report

Date: January 6, 2005

These comments are intended to respond to and expand upon three components of the AQM Work Group Final Report:

- 2.13 Conformity
- 3.9 Co-Benefits
- Long-Term Vision Core Principle #7, land use and transportation planning.

The comments arise from the Clean Air and Smart Growth Forum organized by the Center for Clean Air Policy and the Local Government Commission in Sacramento, CA on December 1-2, 2004. The forum brought together some 50 experts from a variety of disciplines and jurisdictions to provide recommendations on how to improve clean air programs, policies and processes in a way that will support both sustainable land use and emission reduction goals.

Better integration of land use and transportation planning is critical to slowing growth in vehicle miles traveled (VMT) and is therefore an important element in developing conforming transportation programs and plans. A key finding from the CCAP/LGC forum is that implementing integrated land use and transportation policies requires quantification communication of the broader co-benefits of smart growth polices (quality of life, congestion, infrastructure cost savings, etc.).

Rapid growth in VMT poses perhaps the most serious challenge to reducing transportation sector emissions and achieving air quality goals. Land use patterns have a strong influence on the amount of driving based on the availability of transportation choices and distances between origins and destinations. More integrated land use and transportation policies such as smart growth, transit-oriented development, and infill development hold significant promise for reducing transportation emissions.<sup>14</sup>

The forum recommendations were grouped into three categories: A. Clean Air Act, B. Modeling, and C. Implementation. Below we include highlights of those recommendations that are pertinent to the AQM Work Group report and have provided key recommendations in italics.

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<sup>14</sup> See, for example:

- Center for Clean Air Policy, *Smart Growth and Air Quality Primer*, December 2004.
- Ewing, R., Pendall, R., and D. Chen. *Measuring Sprawl And Its Impact Volume I*. October 2002.
- L. Frank, "Land Use Impacts on Travel Choice and Vehicle Emissions in the Central Puget Sound: Methodology and Findings," *Transportation Research - Part D., March 2000*.
- Holtzclaw, J., Clear, R., Dittmar, H., Goldstein, D, and P. Haas, "Location Efficiency: Neighborhood and Socioeconomic Characteristics Determine Auto Ownership and Use – Studies In Chicago, Los Angeles And San Francisco," *Transportation Planning and Technology*, 2002, Vol. 25, pp. 1–27.

## **A. Clean Air Act**

### **1. Require Alternative Scenario Analyses for Transportation Improvement Plans (TIPs) and Long Range Transportation Plans (LRTPs)**

The TIP and LRTP planning process require alternatives analyses only for specific large projects but not for the full Program or Plan. At the local project scale the likelihood of detecting any discernible land-use impact is small – thus lower-cost, more efficient alternatives may be missed. A change that could fix this, and in turn strengthen the current conformity process, would be a requirement that MPOs include regional alternative transportation and land use scenarios in their TIP and LRTP updates. This could include, for example, increased transit service, infill and mixed-use development. If MPOs were required to generate such alternative scenarios at the regional scale, it would help officials consider various planning factors and opportunities to avoid or minimize various adverse impacts of project and plan investments. This would maximize the satisfaction of regional and federal objectives and make the benefits of comprehensive smart growth planning readily apparent.

EPA (with FHWA/FTA) could prepare guidance on how to conduct alternative transportation and land use scenario analyses. This might require working with Congress on legislative changes. It would likely require financial support from the federal government so that it does not become an “un-funded mandate.” EPA could work with regions that have already done such analyses (e.g., Sacramento) as a starting point for piloting such an effort.

### **2. Ensure Emissions Baseline Integrity**

Baseline land use assumptions have a big impact on the level of travel demand and available travel choices. Too often, the assumptions are not subject to rigorous review in terms of quality or how realistic they are. While, alternative scenario analyses can help improve the quality of input assumptions, more is needed to ensure that assumptions are reasonable. In some cases, the conformity process is iterative in nature, where, for example modelers increase transit ridership or land use densities until conformity is met (in conjunction with other measures). While fine in principle, there appears to be little in the way of follow up to ensure that those assumptions are realistic and realized. If a plan conforms due, in part, to unrealistic assumptions then it will fail to achieve required emissions levels and will not sufficiently protect public health. We note that there is a higher level of scrutiny for individual control measures even if they may impact fewer tons than key baseline assumptions.

Thus, we recommend increased scrutiny by federal officials to improve the quality and reliability of baseline assumptions, and enhanced tracking and enforcement to ensure that assumptions reflect reality. This is not intended to discourage progressive land use assumptions in transportation plans, but should be done in conjunction with incentives and opportunities to improve input data and to assist with implementation follow through. Land use development is a complex undertaking that involves many parties external to the planning and modeling processes. Therefore, it may be unfair and unrealistic to require literal fulfillment of baseline land use assumptions, but it does seem appropriate to require demonstration of progress toward policy goals embedded in baselines. For example, if the baseline assumes infill development, then local governments or regional bodies should be able to demonstrate new initiatives, funding or incentives to encourage infill development.

EPA (and FHWA) should provide guidance on appropriate land use and transportation baseline assumptions as well as guidance on appropriate level of demonstration. They should explore

potential incentives and efforts for improving input data and for assisting with implementation follow through. EPA should also develop parameters for demonstration of progress toward baseline goals, including guidance on appropriate contingency efforts if baseline assumptions fall short.

### **3. Encourage Greater Use of Land Use Measures in SIPs**

In 2001, the US EPA issued guidance titled, Improving Air Quality through Land Use Activities, to assist states in formally obtaining SIP credit for sustainable land use policies including brownfields and infill development.<sup>15</sup> Only two states (Maryland and Texas) have taken advantage of this guidance. Barriers to participation include modeling complexities, implementation uncertainties and low emission benefits for small-scale projects.

*EPA should consider developing less stringent standards for evaluating land use measures. EPA could consider increasing the 3% cap through voluntary guidance coupled with specific requirements for demonstrating implementation (e.g., region commits funding, zoning modifications passed). Another approach would be to develop a mechanism to allow land use projects as enforceable measures with no percent cap. In either case, it will be important to require a contingency plan, which could include innovative approaches such as including source shut-downs in a community bank.*

## **B. Modeling**

The quality of land use and transportation modeling is often poor due to MPO staff and resource limitations, and a lack of incentives to improve models.

*EPA, FHWA, and FTA should develop joint guidance on improving travel models with minimum acceptable practices, routine audits of modeling used for SIPs/TIPs/RTPs/NEPA to evaluate adequacy of inputs, outputs, sensitivity performance.*

*EPA should pursue a pilot initiative for regions incorporating the following elements:*

- Interagency cooperation
- Performance-based measures: air quality, public health, equity, energy conservation, quality of life
- Uses Best Practice measurement tools
- A transparent public process including regional/local visioning
- Auditing progress

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<sup>15</sup> US EPA, *Final Policy Guidance: Improving Air Quality through Land Use Activities*. EPA420-R-01-001 Transportation and Regional Programs Division, Office of Transportation and Air Quality January 2001 U.S. EPA <http://www.epa.gov/otaq/transp/conform/policy.htm#landuse>, January 2001. Please also see, [www.epa.gov/otaq/transp/landguid.htm](http://www.epa.gov/otaq/transp/landguid.htm).

## **C. Implementation**

It is critical to ensure that land use policies are actually implemented if we are to reap their air quality benefits. The forum identified a number of areas where EPA could help.

### **1. Promote Education and Foster Leadership**

The multiple benefits of smart growth policies are insufficiently understood by many policy makers. There is need for more federal coordination to ensure that policies and funding decisions do not contribute to unsustainable land use patterns and increased transportation emissions.

*EPA should coordinate with other federal agencies (FHWA, FTA, HUD, Fish and Wildlife) at the federal and regional levels on promoting sustainable land use policies that benefit air quality, water quality and quality of life. At the federal level, agency heads, could recommend a Presidential Executive Order, that recommends funding priorities to improve the natural and community environment. At the regional level EPA could help identify a champion in each region (e.g., regional EPA and FHWA offices, elected officials, business leaders) to lead comprehensive smart growth efforts.*

*EPA should work with governors and mayors to foster leadership on dealing with land use, transportation and air quality in an integrated way. This could include expansion of existing efforts, and high-level briefings with elected officials and key staff. It will be important to emphasize health and financial benefits of smart growth policies.*

*EPA, FHWA and FTA should fund indicator development to help promote and track the multiple benefits of smart growth policies. Indicators could include per-capita VMT, exposure to congestion, availability of alternative travel choices, health impacts and infrastructure costs.*

### **2. Ensure that Federal Transportation and Infrastructure Funding Advances Sustainable Land Use and Transportation**

*EPA and DOT should fund regional visioning exercises that elicit public input on alternative transportation and land use scenarios. Efforts such as Envision Utah and the BluePrint project in Sacramento can increase public understanding of and support for efficient, integrated policies.*

*EPA should work with other federal agencies, state and local governments to coordinate infrastructure funding in such a way as to encourage efficient land use patterns and slow growth in VMT. For example, if EPA is promoting brownfield development in a region, it is important to ensure that there are not other incentives that make greenfield development relatively more attractive.*

*EPA should work with Congress to allow transportation funds to be used for updating general plans in ways that can slow growth in VMT.*

*EPA should work with other federal agencies to develop performance-based funding mechanisms and incentives. For example EPA could develop a scorecard to measure local plans against livable community measures such as efficient land use, provision of affordable housing, energy use, CO<sub>2</sub> emissions, etc. Funding would be adjusted based on the scoring.*



Connecticut Bureau of Air Management, Anne Gobin, Acting  
Maine Bureau of Air Quality Control, James Brooks  
Massachusetts Bureau of Waste Prevention, Barbara Kwetz  
New Hampshire Air Resources Division, Robert Scott  
New Jersey Division of Air Quality, William O'Sullivan  
New York Division of Air Resources, David Shaw  
Rhode Island Office of Air Resources, Stephen Majkut  
Vermont Air Pollution Control Division, Richard Valentinietti

December 30, 2004

Janet McCabe, Assistant Commissioner  
Office of Air Management  
Indiana Department of Environmental Management  
100 North Senate Avenue, P.O. Box 6015  
Indianapolis, IN 46206-6015

Re: Comments on the Air Quality Management Workgroup Report

Dear Ms. McCabe:

As a member of the Clean Air Act Advisory Group (CAAAC) representing the Northeast States for Coordinated Air Use Management (NESCAUM), I submit these comments to you on the December 2004 draft report of the Air Quality Management Workgroup (Workgroup), entitled *Recommendations to the Clean Air Act Advisory Committee*. The NESCAUM member states are: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

#### **Short-Term Changes Versus Long-Term Transformations**

We realize that the Workgroup undertook a formidable task, as it had many issues to address and a dauntingly tight timeframe in which to conclude a comprehensive and deliberative public process. We applaud your efforts and the progress that was made in six months, particularly with respect to the short-term State Implementation Plan (SIP) recommendations as well as some of the national control strategy recommendations. However, there are significant segments of work that are far from being concluded or fully deliberated. Given the short time frame for deliberations, we understand that there was an inherent tension between focusing on short-term changes that are needed now versus fully addressing the charge from the National Academy of Sciences to reexamine and recommend significant changes to the current air quality management system. Since the Workgroup consciously chose to focus on short-term changes at this point in time, we request that the final report contains wording that clearly reflects this dynamic, and therefore provides appropriate context.

#### **Phase I and Next Steps**

As you know, NESCAUM previously expressed concerns about the Workgroup's process, particularly with respect to addressing conflicting opinions and more controversial topics. We are pleased to see that the December draft report presents the range of opinions on many of the unresolved issues, and more importantly presents them in context so that future deliberations can fruitfully continue from where the Workgroup left off. We are also pleased that the report title,

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when final, will include the subtitle: "Phase I and Next Steps," reflecting that more deliberation is planned for the near future.

**Enhancing Scientific and Technical Capacity**

We commend the Workgroup's recommendations advancing the scientific and technical capacity of EPA and the states. We encourage EPA to implement these recommendations and seek adequate funding to allow these efforts to proceed

**Prioritizing EPA's Response to the Report and Funding**

The report contains a significant number of recommendations that describe a number of initiatives, studies, protocols, guidance, and regulatory actions that the U.S. Environmental Protection Agency (EPA) should undertake. We strongly urge that EPA begin working closely now with CAAAC and over the next year establish priorities with respect to implementing these recommendations. It is critical that core SIP guidance and regulatory work not be postponed in order to respond to the Workgroup report. In addition, the report's recommendations will be costly to implement. Many of the initiatives will also require staff training and capacity building. We urge that EPA work closely with CAAAC to explore funding opportunities, and ensure that funding available for existing programs critical to the states is not reallocated to initiate the recommendations, or worse -- programs that should be of the highest priority postponed for lack of resources. Further, CAAAC should work with EPA and the states to identify areas in which EPA could reduce or discontinue non-critical existing efforts in areas where improvements are implemented as the result of the CAAAC/Workgroup recommendations.

**Planning for Phase II**

Our vision of Phase II involves a longer planning horizon, a more deliberative process, and broader stakeholder involvement. During this phase, we urge that the following principles be addressed and that these goals be reflected in the report as it is finalized:

- ◆ Focus on a long-term vision. Missing from the Phase I deliberations was focus on a long-term vision for air quality management, including a fuller discussion of integrated planning. Such deliberations address the core of the National Academy of Sciences (NAS) recommendations to the CAAAC. We believe that developing a long-term vision must be the first order of business when Phase II commences. Once a vision is developed, all remaining issue areas can then be discussed within this new framework. In addition, the CAAAC must revisit the Phase I recommendations to ensure they support the long-term vision. This iterative process was agreed to during recent Workgroup deliberations and should be clearly stated in the report.
- ◆ Develop a Nonattainment Framework: During the Phase I deliberations, Workgroup did not develop and work from a conceptual model of air pollution nonattainment, including the contribution of upwind sources to downwind nonattainment. We believe it is important to demonstrate a thorough understanding of what creates the diversity of air pollution problems throughout the nation, and then document how the recommendations will resolve them in a scientifically credible fashion. We need to ensure that subsequent pollution reduction efforts are consistent with the science. Much of the deliberations to date have been control-strategy focused, rather than framework-focused; we believe that

discussions should be directed toward a framework for addressing movement of pollutants.

- ◆ Transform the SIP Process: The NAS report requested that the CAAAC examine ways to transform, not just make short-term changes to, the SIP process. We urge you to ensure that a full set of state SIP planners are involved in these brainstorming sessions. In the NESCAUM region, we have considerable experience in the SIP process, and believe our input would be invaluable in developing a new vision of the SIP.
- ◆ Develop an Integrated Framework for Criteria and Hazardous Air Pollutants: Due to time constraints and competing priorities, the Workgroup was not able to focus on integrating HAPs and Criteria pollutants. The NAS report set out specific tasks for deliberations, e.g., address multi-pollutants in the standard-setting process. We consider this a critical issue to address, and urge that discussions on developing a model for integration occur during Phase II.
- ◆ Continue Discussions on National /Regional Control Strategies: Deliberations must continue, and must include electric generating units (EGUs), notwithstanding the status of Federal rulemaking or legislation. No sector should be accorded differential treatment; discussions should focus on the need for and benefit of controlling such sectors and possible emission reduction program frameworks. Further, proposed regional and national regulations on the EGU sector have not been finalized or implemented and therefore there is no guarantee that they will be sufficient for achieving healthful air quality nationally.

We appreciate the time and effort you have spent in leading the Workgroup and compliment you on your successes to date. The NESCAUM states look forward to working with you on Phase II and providing ideas to develop a new long-term vision for air quality management and public health protection. Thank you for the opportunity to comment. If you would like to discuss these recommendations in greater detail, please contact Leah Weiss at NESCAUM at 617-259-2094.

Sincerely,



Kenneth A. Colburn  
 Executive Director

cc: Greg Green, EPA  
 NESCAUM Directors



ADVOCACY GROUP  
Federal Regulatory & Housing Policy Area



January 3, 2005

Jeff Holmstead  
Assistant Administrator, Office of Air and Radiation  
Chair, Clean Air Act Advisory Committee  
Environmental Protection Agency  
Ariel Rios Building, Room 5426  
Washington, D.C. 20460

Janet McCabe  
Assistant Commissioner, Office of Air Quality  
Co-Chair, Air Quality Management Work Group  
Indiana Department of Environmental Management  
100 North Senate Avenue  
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Re: AQMWG *Recommendations to the Clean Air Act Advisory Committee* Report

Dear Mr. Holmstead and Ms. McCabe:

On behalf of the 215,000 members of the National Association of Home Builders (NAHB), I would like to thank you for the opportunity to provide comments to the Air Quality Management Work Group's (AQMWG) recent recommendations for improving the nation's existing air quality management system based on the National Research Council's (NRC) 2004 *Air Quality Management in the United States* report. NAHB, a long-standing member of the Clean Air Act Advisory Committee (CAAAC), is a Washington, D.C.-based trade association representing members involved in home building, remodeling, multifamily construction, property management, subcontracting, design, housing finance, building product manufacturing and other aspects of residential and light commercial construction.

NAHB's builder members constructed about 80 percent of the more than 1.77 million new housing units started in 2004, making housing one of the largest engines of economic growth in the country. While our members support the goals of the Clean Air Act and environmental protection, they are often affected both directly (i.e., federal or state requirements on diesel engines) and indirectly (i.e., federal or state limits on transportation infrastructure development) by various facets of air quality management regulations that impact both the land development and construction processes. NAHB consistently seeks to ensure that federal requirements that affect home building and development are transparent, legal, scientifically defensible, and provide environmental benefit while maintaining reasonable economic costs.

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Mr. Holmstead and Ms. McCabe  
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The AQMWG recommendations represent an impressive display of collaboration and creative thinking. With their approval by the CAAAC, the request to set up a permanent AQMWG subcommittee, and their transmittal to the Administrator of the U.S. Environmental Protection Agency (EPA), there is little doubt that some action will be taken to implement the recommendations. Though there are recommendations within the report that our association and its members can support or which have relatively little effect on our members, several recommendations give us cause for concern. This result is to be expected, since the process for creating the recommendations eschewed consensus and provided no real opportunity for revision by members of the CAAAC before their submittal to EPA. As a member of the CAAAC, NAHB provides the following comments:

*Federal mandatory diesel retrofits requirements for heavy duty diesel engines could be problematic.*

Recommendation 2.5 suggests a multi-prong approach to heavy duty diesel engine retrofitting, including considering a federal mandatory diesel retrofit requirement. NAHB understands that heavy duty diesel engines contribute to long-standing air quality issues, and supports the recently finalized regulations on non-road diesel engines. NAHB further understands that the benefits of some of the existing regulation of diesel engines will be delayed due to various emissions standards not taking effect until 2007, with looming attainment deadlines for 8-hour ozone and fine particulate matter nonattainment areas and concerns voiced by state air quality agencies about existing non-road diesel engines. It is for this reason that NAHB has long supported voluntary and incentive-based approaches to diesel retrofits. NAHB has concern over the recommendation on federal mandatory retrofit requirements. There exists a question surrounding the utility of existing retrofit technology for various types of existing non-road diesel engines, how mandatory requirements would be implemented, and the ultimate economic impact to members of the building and development community, many of whom are small businesses. It is for these reasons that NAHB continues to urge both the CAAAC and the EPA to explore fully the more appropriate implementation of voluntary and incentive-based programs for achieving the important goal of significant reductions of emissions from existing heavy duty and non-road diesel engines.

*The Energy Star program should not be expanded to include other criteria pollutants.*

Recommendation 2.8 suggests expanding EPA's Energy Star program to gain additional criteria pollutant emissions reductions. NAHB believes that deviating from the current focus on energy conservation will put Energy Star at risk. Having a myriad of modules/programs (Air+, Advanced Lighting Package, Water Star, etc.) attached to Energy Star obscure the purpose of the program for our builders and the public. They will likely lose confidence in a program that has drifted so far from its energy focus. This would have the unfortunate consequence of reducing the number of builders who would

Mr. Holmstead and Ms. McCabe  
Page 3 of 3  
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participate in a revamped program and the number of consumers who create its marketability.

*Expedited measures for State Implementation Plan (SIP) revisions could inappropriately result in the loss of stakeholder involvement.*

Recommendation 3.4 suggests streamlining the SIP revisions to minimize the administrative hurdles of publishing all approvals/disapproval in the Federal Register. While NAHB supports the idea of reducing unnecessary requirements that take resources away from the important goal of improving air quality, we have concern over the loss of stakeholder involvement in setting a “de minimis” level necessary for Federal Register publication. This concern is heightened by the AQMWG emphasis on expanding the creation and use of innovative measures for gaining emissions reductions (Recommendations 3.10 & 3.11). In our experience, innovative measures can have ill-quantified emissions reduction benefits and can represent a hardship for the development industry. For this reason, NAHB urges both the CAAAC and EPA to consider preventing any new, innovative measures from the streamlining recommendation regardless of the level of emissions reduction the SIP revision is intended to gain. Further, NAHB supports the AQMWG suggestions of ensuring that emissions reductions from control measures (innovative or otherwise) have been demonstrated empirically rather than the traditional approach of exclusively utilizing modeling data.

Thank you again for the opportunity to provide these comments on the AQMWG recommendations. The recommendations as a whole represent an opportunity for important revisions to an air quality management system that has already seen impressive reductions in harmful emissions. NAHB looks forward to continuing to work with both EPA and the CAAAC as these issues move forward. Should you have any questions, please do not hesitate to contact Chandler Morse, NAHB staff (202-266-8327; [cmorse@nahb.com](mailto:cmorse@nahb.com)) or myself directly (563-332-6157).

Sincerely,



Charles Collett  
CAAAC Member



January 4, 2005

Connecticut

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District of Columbia

Maine

Maryland

Massachusetts

New Hampshire

New Jersey

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Ms. Janet McCabe and Mr. Greg Green, Co-Chairs  
Air Quality Management Work Group  
U.S. Environmental Protection Agency  
Mail Code C404-04  
Research Triangle Park, NC 27711

Dear Janet McCabe and Greg Green:

The Ozone Transport Commission (OTC), on behalf of its members, is writing to provide its input and views on the Air Quality Management Work Group effort that has been occurring in response to a charge from the Clean Air Act Advisory Committee (CAAAC).

The Air Quality Management (AQM) Work Group, started in August 2004, has made much good progress in this extremely short period of time. We commend this group on the development of a substantial number of recommendations in response to the National Research Council report. This work only happened as a result of diligent efforts by a number of policymakers, stakeholders and EPA staff who have given their time and thoughtful consideration to the project. It is evident that in this brief period a number of very useful ideas have been generated, some of which can be undertaken in the short term that will improve the current air quality planning process.

However, many more worthy issues raised by the NRC report could not be addressed in the time period allotted. Some simply require more thought and consideration, others are more complicated and consensus could not be easily achieved. These recommendations deserve and require a continuation of the effort to date.

Accordingly, we very much appreciate the CAAAC and AQM Work Group's commitment to the two-pronged approach discussed at the December 16<sup>th</sup> meeting, whereby the short and long term issues that needed to be deferred so far, for purposes of completing the CAAAC report to be delivered to EPA this month, will be dealt with by a new subcommittee under the CAAAC in "Phase II" of this process. We understand this new subcommittee is to comprise many of the same members as the AQM Work Group, and the OTC is interested in continuing its participation in this effort.

Specific Comments on AQM Work Group Recommendations. We offer the following specific comments on the AQM Work Group's Recommendations to the Clean Air Act Advisory Committee to provide our views and clarification of some of the issues we raised during the discussion of the report at the December 16<sup>th</sup> meeting. We are attaching excerpts from the report with markups that reflect these comments for your reference and consideration.

In the section of the report that focuses on NRC Recommendation 2, regarding the expansion of national and multi-state control strategies, there is a chart (page 14) depicting the air emissions projected in 2010 from the source categories recommended for examination by the AQM Work Group. This chart inappropriately omits a bar depicting the emissions for the EGU source category, arguably one of the largest contributors of pollution still having significant cost-effective reductions available. Furthermore, it would be more appropriate to include two charts in this section of the report. The first should depict current air emissions for all of the source categories, and the second should depict the air emission for all of the source categories in 2010. The 2010 should reflect emissions from this sector assuming the CAA were fully implemented, but a note could be made about the change in emission levels if the first phase implementation of CAIR were completed.

Among the recommendations that have been deferred for continued assessment and development, it is important to distinguish between those that are short term in nature and those that are long term. There are a number of instances in the report where this distinction should be made with more clarity, and we provide specific language changes to those areas in the marked up excerpts we have attached to this letter.

In addition, among the short term items in Appendix C, the Summary of Deferred Issues, there needs to be a prioritization of the issues and potential recommendations based on their immediacy in terms of state implementation plan (SIP) development. The OTC advocates for placing issue and recommendation #12, "Electric Generating Units (EGUs)," as the new subcommittee's first priority, and it should appear so in the listing in the report. The NRC report had much about transport and the need to address it. Even beyond the reductions outlined in new rules and statutes under consideration by the EPA, including CAIR and the CSA, the EGU sector must go further in terms of making cost-effective emission reductions. This is particularly true considering the significant amount of pollutants that are transported into the northeast and mid-Atlantic from EGU sources outside our region. This is key to the states in our region achieving attainment and to the sector gaining the certainty it seeks. Again, we have indicated where specific language changes should be made to provide this clarity in the report

In closing, the OTC appreciates your attention to and consideration of these comments. We have appreciated the opportunity to work with the AQM Work Group to achieve the realistic and balanced set of short-term recommendations that were presented to the CAAAC, and are interested in continuing to work with you on the effort to develop and evaluate recommendations on the deferred issues and longer term options that will improve the nation's air quality management system. If you have any questions or would like further clarification on our comments, please contact Anna Garcia at (202) 508-3840, or via email at [agarcia@otcair.org](mailto:agarcia@otcair.org).

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Recchia", written over a light blue horizontal line.

Christopher Recchia  
Executive Director

cc: OTC Members  
Debbie Stackhouse, EPA

## **Additional Comments from the Ozone Transport Commission Excerpts from AQMWG Report for Comment**

Executive Summary, pg viii

Over the past six months, the Work Group also considered a variety of other issues on which it is not prepared to make recommendations at this time, some of which are short term and others long term. Some topics were so complex, resource intensive, or controversial that the Work Group was unable to reach consensus and, therefore, has decided not to carry them forward. Additional discussion on these topics is expected in the future, with some resolution about the deferred short term issues within the next three to six months by a new subcommittee of the CAAAC .

The Work Group has also begun considering options for the air quality management system in the future. It evaluated the long-term challenges facing air quality management in the U.S. from a number of perspectives and identified several criteria that may help guide discussions on alternatives for reforming the current system in future years. To help begin this process, the Work Group outlines four approaches reflecting different views that could serve as the basis for a more complete transformation of the air quality management system. In addition, the Work Group recommends that discussion of future options and unresolved issues be continued over the next several months.

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### **Next Steps**

The Work Group recommends that decisions on implementation of the recommendations in this report, as well as discussion of future options and unresolved issues, be continued over the next several months. These continuing discussions would also allow review and/or adjustment of the near-term recommendations if warranted. Specifically, the Work Group recommends:

- A new subcommittee of CAAAC should be established to continue the assessment and development of recommendations for long-term changes to the air quality management system and the short-term issues on which the Work Group could not reach consensus. Until this subcommittee is formed, the current Work Group should continue working to resolve additional short-term issues and continue discussion of long-term framework options. Following its establishment under the CAAAC, the subcommittee should develop a prioritization and timeline for preparing additional recommendations and provide periodic progress reports to CAAAC. Discussion of all remaining issues and options should be directed towards further strengthening the U.S. air quality management framework over the next decade. The Work Group recommends that the new subcommittee, in conjunction with existing subcommittees, also be given the responsibility for overseeing the implementation of, and any modifications to, the recommendations contained in this report.

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Air emissions from the recommended categories are projected to continue to be substantial (see Figure 7). However, a variety of factors must be considered in determining whether and how a sector can be effectively regulated, including pollutant type, geographic location, dispersion patterns, multipollutant interactions, control strategy availability, emissions reduction potential, and cost-effectiveness. Some Work Group participants believe that adequate information exists to begin the regulatory process now for certain source categories, while others believe that additional data and data analyses are necessary. After extensive deliberations, the Work Group recommends that each of the sectors listed below be addressed in some fashion by EPA. This action may include, but should not be limited to, development of national and/or regional rules, control technique guidelines, other guidance, and/or further study.

**Figure 7. Projected 2010 National Emissions for Key Source Categories.** In developing recommendations relating to the source categories shown here, Workgroup analysts examined projected emissions of five key criteria pollutants to 2010 for a list of 40 stationary and mobile categories. Excluding natural emission sources, the categories shown comprise over XX percent of the national SO<sub>x</sub> and NO<sub>x</sub> emissions and about XX percent of the direct PM<sub>2.5</sub> and VOC emissions. These projections include recognized uncertainties in the current inventory and the forecast. Due to data limitations, the assessment did not include estimates of air toxics emissions or ammonia. (Add a bar for the EGU sector to this chart, and include a second chart that displays all the same sectors for current air emissions.)

### **Unresolved Issues for Further Discussions**

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A second potential recommendation discussed at length by the Work Group was the electricity generating unit (EGU) sector because of the large contribution that this sector makes to multiple air quality problems. Many on the Work Group believed that the active rulemaking underway on the Clear Air Interstate Rule (CAIR) provided the proper forum for considering what this sector ought to do for the next 15 years or more; others did not. Since no agreement could be reached on a recommendation regarding this sector, the Work Group recommends that discussions continue by the new CAAAC subcommittee. Regardless of the outcome of any future discussions, many of the stakeholders involved saw value in S/L/T and utilities consulting with each other after final promulgation of the CAIR (or new legislation) to share compliance plans, evaluate likely emissions reductions and their geographic distribution, and apply that information to further planning activities. (This section needs to be rewritten since CAIR will not be promulgated. It is important that the EGU sector be given highest priority in terms of the issues being addressed by the new subcommittee. Consideration of additional regulatory action in this sector is critical for states, localities and tribes in meeting their air quality requirements.)

Pg. 88 – Appendix C Summary of Deferred Issues

1) Electric Generating Units: Consistent with the comments we made regarding page 33 of the report, on the priority of addressing this sector through additional national/regional regulations, this should appear as the first item in a prioritized list of the issues and potential

recommendations for future discussion. The AQMWG should prioritize the other 11 issues and recommendations according to their value to states, localities and tribe in meeting the immediately upcoming SIP and air quality requirements.



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January 14, 2005

To the Clean Air Act Advisory Committee:

The National Tribal Air Association (NTAA) is pleased to submit comments on the Air Quality Management Work Group (AQMWG) document entitled "Recommendations to the Clean Air Act Advisory Committee." (CAAAC) We understand the laborious process AQMWG took on in creating this, especially under the guise of consensus.

The NTAA is an autonomous organization of the National Tribal Environmental Council ("NTEC"). The NTAA's mission is to advance air quality management policies and programs, consistent with the needs, interests, and unique legal status of American Indian tribes and Alaskan Natives. In November of 2000, the National Congress of American Indians ("NCAI") passed a resolution giving Tribal leadership support for the formulation of a National Tribal Air Quality organization. In February 2002, under an EPA grant, NTEC formed the National Tribal Air Committee ("NTAC") Working Group to create the organization's infrastructure. During NCAI's November 2002 Annual conference, a resolution was passed establishing a working relationship between the NTAA and NCAI. Today NTAA continues to build partnerships and working relationships with government and non-governmental organizations, with the intent of advancing air quality issues in Indian country. Currently, the NTAA has forty-five principal member tribes/villages and twenty-five associate members.

As a whole the NTAA supports the document and recommendations developed by AQMWG. We understand this is a result to assessing the recommendations made by the National Research Council (NRC) of the National Academies in its 2004 report, "Air Quality Management in the United States", and subsequently advising the CAAAC on ways to improve the U.S. air quality management system, with an emphasis on activities that could be achieved in the next one to five years. The NTAA appreciates the inclusion of American Indian tribes and Alaskan Native Villages into the final document. In addition, we also support the inclusion of recommendation 4.3—"Greenhouse Gas Co-benefits and Disbenefits."

However, there are specific items for which we would like to bring to your attention, on behalf of all federally recognized tribal nations. Recommendation 1, "Strengthen Scientific and Technical Capacity" is a necessity within tribal lands, but it must be carried out in a way where tribal science and knowledge is not lost in the discourse and policy making process. In developing techniques of modeling and assessing risk it is imperative that tribal practices are considered and included.

Recommendation 2, "Expand National and Multistate Control Strategies" has specific recommendations, which are key issues in tribal communities. Item 2.10, pertaining to residential wood smoke is one item. Many tribal communities utilize wood burning stoves and fireplaces as their primary source of heating and cooking. One reason is due to traditional practices that have been intact since time immemorial. A second rational is simple economics. Wood is an abundant resource. More often than not, Tribal communities are some of the poorest social economic classes in the country. Therefore, utilizing a cheap and abundant resource is simple economics. The NTAA is aware of several programs, which try and supplement conversions of wood stoves, which are outdated and inefficient to newer ones that reduce air pollution. However, these programs do not address the economic disparity which tribal communities have. Simply put, more often than not, a tribal person cannot afford a newer, more advanced wood stove because even with the compensation by companies or government, it is still too costly. This paradigm needs to be addressed. Recommendation 2.11, entitled "open burning" is a serious health concern in many tribal communities. While many tribal governments have developed open burning policies and ordinances, the NTAA encourages the EPA to continue in its education and assistance in allowing tribal governments to develop similar open burning policies.

Recommendation 3, "Transform the SIP process and streamlining the SIP process" potentially will impact tribes the greatest. While tribal governments under the Clean Air Amendments of 1990 have the authority

to develop a Tribal Implementation Plan (TIP), many tribes do not have the capacity to carry out such a task. Therefore, most tribes shall be impacted by a state's SIP process. The NTAA hopes that streamlining the SIP and transforming the SIP process does not jeopardize tribal sovereignty and tribes' capacity to engage in the SIP process when the SIP will directly affect them. More specific the NTAA does not endorse recommendation 3.6 "Avoid unnecessary Public Hearings." It is the opinion of the NTAA that no public hearing is unnecessary.

Recommendation 5, "Enhance Protection of Ecosystems and Public Welfare" is an issue of grave concern to tribal members. Due to the reliance of traditional subsistence lifestyles by many tribal persons, we are dramatically affected by the drastic changes in ecosystem health and global shifts in climate. The poisoning of our airsheds, watersheds, and lands not only affects our health, but our cultural subsistence of our immediate ecosystems. For many tribal cultures, our food, our medicine, and our culture are directly related to the health of our surrounding ecosystems. We welcome AQMWG's recommendation on this topic.

The NTAA wished to bring up two general issues, which we feel are imperative for the continued success of tribal air programs and protecting tribal airsheds. The first, is addressing the designation of attainment and non-attainment for air pollution. Currently these designations are done via county lines. In some cases tribal lands fall within multiple county jurisdictions. Therefore, a tribe may find itself in partial attainment and non-attainment due to current mapping and modeling practices. Yet this current trend does not properly address tribal sovereignty or tribal authority. We hope to see future mapping and modeling include tribal lands separate from county boundaries. Second, the NTAA suggested that the CAAAC look into the possibility of any form of "cap and trade" program or any other form of economic control measures to incorporate tribal set asides. Tribal governments should not have to compete with states and industry within these innovative pollution control programs. In addition, the NTAA would recommend that any incorporation of a tribal set aside to be in a staggered phase. This would allow tribes who are ready now to be able to participate, but not limit or restrict future tribal governments from being excluded because of the lack of current capacity to participate.

The NTAA appreciates this opportunity to comment on the AQMWG's document entitled "Recommendations to the Clean Air Act Advisory Committee." We applaud the challenging process that the group took on, and the method of consensus, which was used. It is our hope that CAAAC moves forward with these recommendations, and considers our comments in addressing air quality and public health. If you have any questions please do not hesitate to contact us.

Respectfully submitted,

J. Stephen Hartsfield  
Operations Coordinator, National Tribal Air Association