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Particulate Matter ($PM_{2.5}$): National Ambient Air Quality Standards (NAAQS) Implementation

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Summary

Particulate matter (PM), including fine particulate matter ($PM_{2.5}$), is one of the six principal pollutants for which the U.S. Environmental Protection Agency (EPA) has set National Ambient Air Quality Standards (NAAQS) under the Clean Air Act (CAA). NAAQS are designed to protect human health within an adequate margin of safety. After years of litigation and other delays, EPA is moving to implement the NAAQS for $PM_{2.5}$ promulgated in 1997. This report, which will be updated as developments warrant, provides information on the designation process for $PM_{2.5}$ "attainment" and "nonattainment" areas. It also discusses issues that have been raised as EPA, the states, and nonattainment areas develop implementation strategies.

EPA published a final rule on April 14, 2005, amending designated geographical areas for $PM_{2.5}$ standards, which were originally published in January 2005. The Agency's amendments were based on a review of supplemental 2004 air monitoring data submitted by several states. As a result, 39 areas, consisting of 208 counties in 20 states and the District of Columbia, were designated as nonattainment areas.

$PM_{2.5}$ nonattainment areas are required to develop comprehensive implementation plans, referred to as State Implementation Plans (SIPs), demonstrating how attainment will be reached by a designated deadline. SIPs include pollution control measures that rely on models of the impact on air quality of projected emission reductions to demonstrate attainment. EPA published a proposed "$PM_{2.5}$ implementation" rule November 1, 2005, that provides guidance and procedures for establishing controls to achieve and maintain attainment.

A number of issues will continue to be debated as the implementation of the $PM_{2.5}$ NAAQS progresses. Some areas that have not been designated as nonattainment under implementation of other NAAQS have been designated "nonattainment" for the first time. Questions and concerns include the following: what criteria were used to determine nonattainment; whether special provisions can be made for meeting attainment deadlines, particularly for areas affected by upwind pollution; what grants or other funding might be available to help areas reach attainment; and how nonattainment designation might affect economic development and transportation planning in an area.

Legislation and EPA rulemaking that affect aspects of regulating air quality could influence the implementation process. Court challenges that followed the release of the eight-hour ozone designations, and EPA's mandated periodic review of PM NAAQS, could also affect $PM_{2.5}$ NAAQS implementation. As part of the review process, on December 20, 2005, the EPA Administrator signed a proposal to revise the NAAQS for particulate matter (both $PM_{2.5}$ and $PM_{10-2.5}$), which included a strengthening of the existing $PM_{2.5}$ standard.

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Particulate Matter ($PM_{2.5}$): National Ambient Air Quality Standards (NAAQS) Implementation

Introduction

National Ambient (outdoor) Air Quality Standards (NAAQS) are a core component of the Clean Air Act (CAA).[1] The statute requires that, based on a review of the scientific literature, the Environmental Protection Agency (EPA) set (1) "primary" standards at a level "requisite to protect the public health" with an "adequate margin of safety" and (2) "secondary" standards at a level "requisite to protect the public welfare."[2] EPA has promulgated NAAQS for six principal pollutants classified by the agency as "criteria pollutants": sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, lead, and particulate matter (PM).

This report provides an overview of the NAAQS implementation process in the context of the standards for fine particulate matter ($PM_{2.5}$), which consists of particles less than 2.5 micrometers in diameter. It also discusses issues and legislation that could potentially alter the $PM_{2.5}$ implementation process. EPA is in the process of implementing the "new" NAAQS for particulate matter promulgated in 1997 (62 *Federal Register* 38652, July 18, 1997), delayed because of court challenges and other factors. EPA's 1997 revisions to the particulate matter standards (also referred to as the PM NAAQS) included separate requirements for $PM_{2.5}$.[3] Since they were modified, the PM NAAQS have been the source of significant concern and national debate, which has delayed their implementation. Congress has been particularly interested in EPA's promulgation and implementation of these CAA standards and has held numerous hearings on particulate matter (and the ozone NAAQS established in 1997).

A key component of implementing the 1997 PM NAAQS is EPA's designations of geographical areas for "attainment" or "nonattainment" of the air quality standards

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[1] Sections 108 and 109 of the Clean Air Act (CAA) govern the establishment, review, and revisions of NAAQS (42 U.S.C. 7408 and 7409). See CRS Report RL30853: *Clean Air Act: A Summary of the Act and Its Major Requirements*, and CRS Report 97-722 ENR, *Air Quality Standards: The Decisionmaking Process*.

[2] See 42 U.S.C. 7409(b)(1) for "primary"; 42 U.S.C. 7409(b)(2) and 7602(h) for secondary.

[3] EPA also revised the coarse particles designation (PM_{10}) in the July 1997 *Federal Register* notice. PM_{10} NAAQS were promulgated in 1987 (52 *Federal Register* 24640, July 1, 1987).

for $PM_{2.5}$. EPA's final designation of all or part of 208 counties[4] in 20 states and the District of Columbia for nonattainment of the $PM_{2.5}$ NAAQS became effective on April 5, 2005 (70 *Federal Register* 944-1019).[5] The final designations were based, in part, on the EPA's consideration of recommendations previously provided by states and tribes, and supplemental 2004 air monitoring data submitted by some states. Nonattainment designation begins a process in which states (and tribes) must develop and adopt emission control programs sufficient to bring air quality into compliance by a statutorily defined deadline. States are required to submit "implementation" plans for how they will meet the $PM_{2.5}$ NAAQS by April 2008, and must be in compliance by 2010, unless they are granted a five-year extension.

The designation of "nonattainment" areas has raised questions and concerns, particularly for those areas designated as such for the first time. These questions and concerns include when and why the standards were established, what criteria were used to determine nonattainment, what measures will be necessary to achieve or maintain attainment by the scheduled deadlines, whether special provisions can be made for areas affected by upwind pollution, what flexibility is available for extending the deadline for reaching attainment, whether grants or other funding are available to help areas reach attainment, and how designation might affect economic development and transportation investments in an area.[6] Concerns have also been raised regarding compliance deadlines with respect to EPA's timely provision of implementation procedures and guidance for achieving and maintaining compliance with the $PM_{2.5}$ NAAQS. EPA published a proposed "$PM_{2.5}$ implementation" rule on November 1, 2005 (70 *Federal Register* 65984), and targeted mid-2006 for a final rule. It is unclear whether EPA's review and assessment of the latest relevant scientific studies,[7] and its related proposal to modify the PM NAAQS (71 *Federal Register* 2620, January 17, 2006), will affect the $PM_{2.5}$ implementation process. As required by consent agreement, EPA's proposed decision regarding potential changes to the PM NAAQS was signed by EPA Administrator Stephen L. Johnson on December 20, 2005. The proposal would strengthen the existing standard for $PM_{2.5}$ and for larger, but still inhalable, coarse particles ($PM_{10-2.5}$). Several elements of the proposed PM standards may prove controversial, including the exclusion of rural sources from the coarse particle standard and the disregard of EPA's independent Clean Air Scientific Advisory Committee's (CASAC's) recommendations. The

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[4] All designated counties and partial counties, including Indian Country geographically located within such areas, except as otherwise indicated by the EPA. See EPA's "PM2.5 Designations" website at [http://www.epa.gov/pmdesignations].

[5] EPA published a final supplemental rule on April 14, 2005, amending the Agency's initial final designations published in January 2005. The earlier rule (70 *Federal Register* 944) included a provision for EPA to withdraw a nonattainment designation prior to the April 5, 2005, effective date if a state provided 2004 air monitoring data by February 22, 2005, suggesting that a change in designation would be appropriate. Monitoring data for 2004 was not available in time for EPA to meet its statutory deadline for completing its designations.

[6] EPA's April 15, 2004, geographical designations for a new ozone air quality standard (promulgated the same time as the $PM_{2.5}$ NAAQS in 1997) raised similar concerns. See CRS Report RL32345, *Implementation of EPA's 8-Hour Ozone Standard*, by James E. McCarthy.

[7] As required under Section 109[d][1] of the Clean Air Act (CAA).

consent decree requires the Administrator to finalize a decision on the PM NAAQS by September 27, 2006. (See CRS Report RLRL33254: *Air Quality: EPA's Proposed Changes to the Particulate Matter (PM) Standard*, by Robert Esworthy and James E. McCarthy.)

These issues and others potentially affecting the implementation of the $PM_{2.5}$ NAAQS are presented in the following sections of this report, which begins with an overview of the PM standards and the geographical designation process.

The $PM_{2.5}$ Standards

Regulation and monitoring of particulate matter under the CAA, beginning in 1971, focused primarily on total suspended particles (TSP) and later on, coarse particles equal to or less than 10 micrometers in diameter (PM_{10}).[8] After extensive analysis and review, EPA revised the PM standards to provide separate requirements for fine particulate matter ($PM_{2.5}$) based on their link to several types of cardiovascular and respiratory health problems, including aggravated asthma and bronchitis, and links to premature death.[9] EPA also revised the coarse particles designation (PM_{10}) to include particles larger than 2.5 but smaller than 10 micrometers ($PM_{10-2.5}$), so as to explicitly exclude fine particles, and as part of the 1997 rule, promulgated the eight-hour ozone standard.

The primary and the secondary $PM_{2.5}$ NAAQS requirements, which became effective September 16, 1997,[10] are the same. The $PM_{2.5}$ standards are set at

- an annual maximum concentration of 15 micrograms per cubic meter ($\mu g/m^3$) based on the three-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from one or more community-oriented monitors;[11] and

- a 24-hour concentration of 65 $\mu g/m^3$, based on the three-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations at each population-oriented monitor[12] within the area.

In requiring both the annual and the 24-hour $PM_{2.5}$ standards, EPA reportedly considered the "combined effect of the standards rather than an approach that weighed short- and long-term exposure evidence, analyses, and standards

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[8] 52 *Federal Register* 24640, July 1, 1987.

[9] For an update of EPA's health effects and other PM-related research activities, see [http://www.epa.gov/pmresearch/].

[10] 62 *Federal Register* 38652-38896, July 18, 1997.

[11] Community oriented monitoring zones are defined as "an optional averaging area with well established boundaries such as county or census block" (40 *CFR* Part 58 Subpart A).

[12] Population-oriented monitoring (or sites) applies to "residential areas, commercial areas, recreational areas, industrial areas, and other areas where a substantial number of people may spend a significant fraction of their day" (40 *CFR* Part 58 Subpart A).

independently."[13] EPA considers the annual standard the primary requirement for reducing total $PM_{2.5}$ risk. The 24-hour standard is intended to provide supplemental protection for days with peak $PM_{2.5}$ concentrations, localized "hot spots," and $PM_{2.5}$ risks arising from seasonal emissions.

EPA changed the "form" of the 24-hour standards to a concentration-based percentile form, indicating the percent of the time that a monitoring station can exceed the standard. For instance, a 99th percentile 24-hour standard indicates that a monitoring station can exceed the standard 1% of the time during the year. The previous form was known as the "one-expected-exceedance" form; monitoring stations could exceed the 24-hour PM NAAQS only once per year (averaged over three years). Although the limits of PM_{10} remained the same, the form of the PM_{10} 24-hour standard was changed to be based on a three-year average of the 99th percentile of 24-hour PM_{10} concentrations.

Geographical Area Designation Process

The designation of geographical areas failing to comply with the NAAQS based on monitoring and analysis of relevant air quality data is a critical step in NAAQS implementation. The CAA establishes a process for designating nonattainment areas and setting their boundaries, but it allows the EPA Administrator some discretion in determining what the final boundaries of the areas will be. Areas are identified as "nonattainment" when they violate or contribute to the violation of NAAQS. Areas are identified as "attainment/unclassified"[14] when they meet the standard or when the data are insufficient for determining compliance with the NAAQS.

According to EPA's 2003 *Trends Report*, 124 areas were designated as nonattainment for at least one of the six criteria pollutants (including particulate matter) and approximately 126 million people lived in these areas, as of September 2002.[15] The number of nonattainment areas and associated population have increased since the 2003 *Trends Report*; the April 15, 2004, eight-hour ozone designated nonattainment areas alone include 159 million people.[16]

The designation process is intended as a cooperative federal-state/tribe process in which states/tribes provide initial designation recommendations to EPA for consideration. Tribes are not required, but have been encouraged, to submit recommendations. The area designation requirements under the CAA (section 107)

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[13] U.S. EPA Fact Sheet: *EPA's Revised Particulate Matter Standards*, July 17, 1997.

[14] Section 107(d)(1)(A)(iii) of the CAA provides that any area which EPA cannot designate on the basis of available information as meeting or not meeting the standards should be designated unclassifiable.

[15] U.S. EPA, *National Air Quality Trends Report: 2003 Special Studies*, Chapter 4, pp. 59-61, September 2003, at [http://www.epa.gov/airtrends/pm.html].

[16] The EPA "Greenbook" lists areas of the country where air pollution levels persistently exceed the national ambient air quality standards and may be designated as nonattainment. Current information on the location of NAAQS nonattainment areas is available on EPA's website at [http://www.epa.gov/oar/oaqps/greenbk/].

are specific with respect to states, but not to tribes. EPA plans to follow the same designation process for tribes per sections 110(o) and 301(d) of the CAA and pursuant to the 1988 Tribal Authority Rule, which specifies that tribes shall be treated as states in selected cases (40 CFR Part 49).[17] In Section 107(d)(1)(A) (42 U.S.C. 7407), the statute states that the governor of each state shall submit a list to EPA of all areas in the state, "designating as ... nonattainment, any area that does not meet (*or that contributes to ambient air quality in a nearby area that does not meet*)" an air quality standard (emphasis added).

$PM_{2.5}$ attainment or nonattainment designations are to be made primarily on the basis of three-year federally referenced $PM_{2.5}$ monitoring data.[18] At the time the new NAAQS were being finalized in 1997, EPA also began developing methods for monitoring fine particles. Using funding specifically authorized for this purpose in EPA appropriations FY1998-FY2000,[19] the agency worked closely with states and tribes to initiate the deployment of a portion of the network of 1,200 monitors in January 1999. The majority of the monitors were not in place until January 2000. States/tribes were expected to rely on data collected during 2000-2002 for their recommendations. EPA considered the 2001-2003 data to make the final $PM_{2.5}$ designations published in January 2005.

In its guidance document,[20] EPA identified several factors that would be considered in determining attainment with the $PM_{2.5}$ NAAQS, and also specified data and conditions that would not be acceptable. The EPA's nonbinding guidance also included a recommendation that states/tribes consider using the same boundaries for nonattainment for both the $PM_{2.5}$ and eight-hour ozone standards, to facilitate consistency in future implementation plans. EPA expected that many of the $PM_{2.5}$ nonattainment areas would overlap with the eight-hour ozone designations.[21]

$PM_{2.5}$ designations do not include nonattainment classifications based on severity as is the case with PM_{10} and ozone, which have two and seven classifications, respectively. The 1990 CAA Amendments include classifications of nonattainment based on the extent to which the NAAQS is exceeded, and establish specific pollution controls and attainment dates for each classification (Title I Part D Sections 171-193). Under subpart 4 of the CAA, PM_{10} nonattainment designations are either "moderate" or "serious," and each of these categories is subject to specified

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[17] For information regarding tribes that have participated in the $PM_{2.5}$ designation recommendation process see [http://www.epa.gov/pmdesignations].

[18] A federally referenced monitor is one that has been accepted for use by EPA for comparison of the NAAQS by meeting the design specifications, and certain precision and bias (performance) specifications (40 CFR Part 58).

[19] Appropriations for monitoring averaged roughly $50 million per year, P.L. 105-65, P.L. 105-226, P.L. 106-74.

[20] See EPA's NAAQS website at [http://www.epa.gov/ttn/naaqs/pm/pm25_guide.html].

[21] A map showing the final designation areas for $PM_{2.5}$ and for the eight-hour ozone NAAQS, is available on EPA's website at [http://www.epa.gov/oar/oaqps/greenbk/mappm25o3.html].

control requirements.[22] EPA has interpreted that those classification provisions in the act regarding particulate matter explicitly apply to PM_{10}, but not $PM_{2.5}$, NAAQS implementation. Based on this interpretation, $PM_{2.5}$ implementation is governed by the general nonattainment planning requirements of Title I (Part A, and Part D subpart 1) of the act.

EPA recognized that determining the geographic extent of nearby source areas that contribute to nonattainment would be complicated. The CAA does not specifically require combining neighboring counties within the same nonattainment area, but it does require the use of metropolitan statistical area boundaries in the more severely polluted areas (Section 107(d)(4)(A)(iv)). Echoing this requirement, and similar to the eight-hour ozone approach, EPA recommended that Metropolitan Statistical Areas or Consolidated Metropolitan Statistical Areas[23] serve as the "presumptive boundary" for nonattainment areas under the $PM_{2.5}$ standards.

Metropolitan areas are generally treated as units, even where part of the area lies in a separate state or where part of the area does not have readings exceeding the standards. In the latter case, even though a specific county may not exceed the standards, the pollution generated there is likely to influence $PM_{2.5}$ levels elsewhere in the metropolitan area. In addition, including the entire metropolitan area avoids the creation of additional incentives for sprawl development on the fringes of urban areas. For rural areas in violation of the $PM_{2.5}$ standards, EPA's guidance presumed that the full county would be designated a nonattainment area.

Following state/tribe designation submissions, the EPA Administrator has discretion to make modifications, including to the area boundaries. As required by statute (Section 107[d]1[B][ii]), the agency must notify the states/tribes regarding any modifications, allowing them sufficient opportunity to demonstrate why a proposed modification is inappropriate, but the final determination rests with EPA.

Information regarding EPA's guidance for $PM_{2.5}$ designation can be obtained from EPA's $PM_{2.5}$ website, [http://www.epa.gov/ttn/naaqs/pm/pm25_index.html], and its Policy and Guidance website, [http://www.epa.gov/ttn/oarpg].

$PM_{2.5}$ NAAQS Geographical Area Designations: A Chronology

By the end of February 2004, 18 states and the District of Columbia had recommended 142 counties as potential nonattainment areas.[24] After completing its

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[22] Moderate areas require permits for new and modified major stationary sources of PM_{10} and must impose reasonably available control measures (RACM). Serious areas must impose best available control measures (BACM) and reduce the defined major source of PM_{10} from 100 tons per year to 70 tons per year. The deadline for attainment for moderate areas is six years after designation; for serious areas, the deadline is 10 years after designation. (Section 188 of Part D subpart 4 of Title I in the CAA; 42 U.S.C. Sec. 7513).

[23] Defined by the Office of Management Budget. For more information on of metropolitan areas, see [http://www.census.gov/population/www/estimates/aboutmetro.html].

[24] For EPA's final and proposed $PM_{2.5}$ geographical designation recommendations and those (continued...)

review of these attainment designation recommendations, EPA recommended modifications resulting in nonattainment designations for 244 counties[25] in 21 states and the District of Columbia at the end of June 2004. As required by statute, the EPA notified each of the affected states regarding their specific modifications to provide them with the opportunity to provide new information and demonstrate why a proposed modification is inappropriate. Some states responding to the EPA's proposal continued to support their original recommendations.

The EPA's final $PM_{2.5}$ designation rule, published on January 5, 2005 (70 *Federal Register* 944-1019), established the boundaries for areas designated as nonattainment, unclassifiable (data not sufficient to make a determination regarding compliance), or "attainment/unclassifiable." EPA designated 47 areas composed of 225 counties in 20 states and the District of Columbia as nonattainment; 5 areas consisting of 7 counties as unclassifiable;[26] and the remaining counties in the United States as attainment/unclassifiable.

EPA's designations reflected minor modifications to its June 2004 proposal. Primarily 19 counties were removed from the list of nonattainment areas, and other counties were redefined by designating only specified locations ("partial") within the county as nonattainment. In some cases, when considering factors defined in its guidance in conjunction with the additional information provided by the states/tribes, EPA determined that only those portions of a county that contained the significant sources of emissions should be considered as contributing to the violations. In other cases, the agency determined that if emissions from a large identifiable source in a county were contributing to the violations in a nearby area, the portion of the county where the source was located would be designated nonattainment, even if it is not contiguous with the remainder of the designated area. The boundaries for these "noncontiguous" portions are based on legally recognized government boundaries, such as townships, tax districts, or census blocks.

Some states and stakeholders continued to contend that several counties should not be designated nonattainment, particularly when taking into account 2004 $PM_{2.5}$ monitoring data. EPA's final designations were based on monitoring data for the three-year period 2001-2003. Monitoring data for 2004 were not available in time for EPA to meet its statutory deadline (see timeline and discussion later in this report) for $PM_{2.5}$ geographical area designations. The final $PM_{2.5}$ designation rule, published on January 5, 2005, included provisions allowing states to submit no later than February 22, 2005, certified, quality-assured 2004 monitoring data that suggests a change in designation is appropriate for consideration (70 *Federal Register* 948). A

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[24] (...continued)
from individual states and tribes, see EPA's "$PM_{2.5}$ Designations" website, [http://www.epa.gov/pmdesignations].

[25] Included 7 cities: Baltimore, MD; St. Louis, MO; Alexandria, VA; Fairfax, VA; Falls Church, VA; Manassas, VA; and Manassas Park, VA.

[26] EPA concluded that there was insufficient information to designate these areas as either nonattainment or attainment/unclassifiable. According to the January 2005 Federal Register Notice (70 FR 65984) these areas had violating monitors for the years 2000-2002, but incomplete data or other data issues for the years 2001-2003.

nonattainment designation could be withdrawn if the EPA agreed that the additional data warranted such a change.

On April 14, 2005, EPA published a final supplemental rule amending the Agency's initial final designations published in January 2005 (70 *Federal Register* 19844). After reviewing 2002-2004 air quality monitoring data provided by several states, EPA determined that eight areas comprising 17 counties previously identified as not meeting the $PM_{2.5}$ NAAQS should be designated as "in attainment" (see **Table 1** below). EPA also changed four of the five areas designated as unclassifiable to attainment, based on 2002-2004 data. EPA does not consider the modifications for these areas "re-designations" because the changes were made prior to the April 5, 2005, effective date of the initial designations.

Table 1. Areas Previously Identified as Nonattainment for $PM_{2.5}$ NAAQS Amended to be Designated as Attaining the Standards

State	Area Name	County
Alabama	Columbus, GA-AL	Russell
California	San Diego, CA	San Diego
Georgia	Athens, GA Columbus, GA-AL	Clarke Muscogee
Indiana	Elkhart, IN	Elkhart St. Joseph
Kentucky	Lexington, KY	Fayette Mercer (partial)
Ohio	Toledo, OH Youngstown-Warren, OH-PA	Lucas Wood Columbiana Mahoning Trumbull
Pennsylvania	Youngstown-Warren, OH-PA	Mercer
West Virginia	Marion, WV	Marion Monongalia (partial) Harrison (partial)

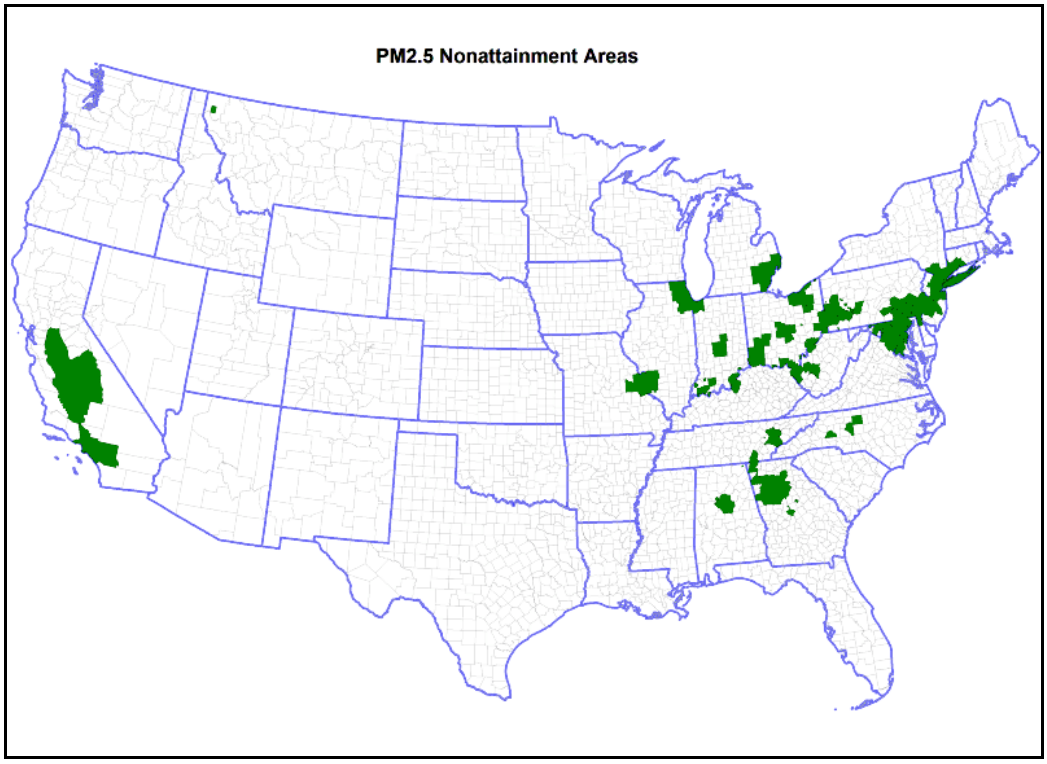
Source: U.S. Environmental Protection Agency, April 5, 2005. [http://www.epa.gov/pmdesignations/documents/Apr05/changes.htm]

As a result of the changes, nonattainment designations are in effect for the remaining 39 areas comprising 208 counties within 20 states (and the District of Columbia) nationwide, with a combined population of roughly 90 million. The designated nonattainment areas are primarily concentrated in the central, mid-Atlantic, and southeastern states east of the Mississippi River, as well as in California.[27] The map in **Figure 1** below, obtained from EPA's website ([http://www.epa.gov/pmdesignations/nonattaingreen.htm]), highlights the $PM_{2.5}$

[27] California has established its own $PM_{2.5}$ standards; for more information, see CRS Report RL31531, *Particulate Matter Air Quality Standards: Background and Current Developments*, by Robert Esworthy, or access the California Air Resources Board website at [http://www.arb.ca.gov/pm/pmmeasures/pmmeasures.htm].

nonattainment designation areas. More than 2,900 counties in 30 states have been designated as attainment/unclassifiable for the $PM_{2.5}$ NAAQS. Some public interest groups maintain that at least 150 additional counties warranted nonattainment designations on the basis of emission sources within those areas.[28] Any area that is initially designated attainment/unclassifiable may be subsequently re-designated to nonattainment if ambient air quality data in future years indicate that such a re-designation is appropriate.

Figure 1. U.S. Environmental Protection Agency Designations of Nonattainment Areas for the $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS)



Source: U.S. Environmental Protection Agency, April 5, 2005 ([http://www.epa.gov/pmdesignations/nonattaingreen.htm]). Based primarily on 2001-2003 monitoring data and 2002-2004 data for a subset of states.

Demonstrating Attainment with the $PM_{2.5}$ NAAQS

The State Implementation Plan. Following designation of an area as nonattainment, the state where the area is located must develop a State Implementation Plan (SIP) that demonstrates how attainment with the $PM_{2.5}$ standards will be achieved. Under Section 110 of the CAA, the states must submit their SIPs to EPA within three years of designation; $PM_{2.5}$ SIPs are due April 5, 2008. To be approved, a SIP must demonstrate that the area will reach attainment of the standards by a specified deadline — 2010 for $PM_{2.5}$ unless a five-year extension

[28] *American Lung Association*, December 17, 2004, press release, "No One Should Have to Breathe Unsafe Air," available at [http://www.lungusa.org], accessed October 2005.

allowed under the CAA is granted. SIPs include pollution control measures that will be implemented by federal, state, and local governments, and rely on models of the impact on air quality of projected emission reductions to demonstrate attainment.

EPA's $PM_{2.5}$ Implementation Rule. On November 1, 2005, EPA published a proposed rule (70 *Federal Register* 65984) that describes the requirements States and Tribes must meet in their implementation plans to achieve and maintain attainment of the $PM_{2.5}$ NAAQS.[29] The proposal includes guidance for submitting a SIP demonstrating that reaching attainment within the five-year requirement is impractical. The rulemaking proposes allowing eastern states that fulfill their emission reductions under the CAIR federal cap-and-trade program entirely by reducing emissions from electrical generating units to satisfy SO_2 and NOx RACT requirements under NAAQS for those sources in the states' $PM_{2.5}$ nonattainment areas. This proposal has raised concerns among some environmental and public interest groups, as well as the national associations of air pollution control agencies — the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO).[30]

Transportation Conformity. If new, or revised, SIPs for $PM_{2.5}$ attainment establish or revise a transportation-related emissions allowance ("budget"), or add or delete transportation control measures (TCMs), they will trigger "conformity" determinations. Transportation conformity is required by the CAA, Section 176(c) (42 U.S.C. 7506(c)), to prohibit federal funding and approval for highway and transit projects unless they are consistent with ("conform to") the air quality goals established by a SIP, and will not cause new air quality violations, worsen existing violations, or delay timely attainment of the national ambient air quality standards.[31] The initial conformity rule was promulgated by EPA November 24, 1993 (58 *Federal Register* 62188), and has subsequently been amended several times. The most comprehensive amendments, clarifying and streamlining the 1993 rule, were published August 15, 1997 (62 *Federal Register* 43780).

Transportation conformity, under EPA's previous rules, applied to ozone, PM_{10}, CO, and NOx, but did not include $PM_{2.5}$. On July 1, 2004, EPA published a final rule (69 *Federal Register* 40004) making transportation conformity regulations explicitly applicable to $PM_{2.5}$ nonattainment areas, and including criteria and procedures for the new $PM_{2.5}$ and eight-hour ozone NAAQS. Conformity determinations must be submitted to EPA within one year of the effective date of designating an area as nonattainment. Since the conformity requirements could apply in $PM_{2.5}$

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[29] The rule addresses: attainment demonstration and modeling; local emission reduction measures, including reasonably available control technology (RACT), reasonably available control measures (RACM), and reasonable further progress (RFP); regional emission reduction strategies; innovative program guidance; emission inventory requirements; transportation conformity; and stationary source test methods.

[30] Testimony of John Paul on behalf of the STAPPA/ALAPCO on the EPA's Proposed Rule to Implement the Fine Particle National Ambient Air Quality Standard, November 30, 2005, [http://www.4cleanair.org/FinaltestimonyimplementationruleNSR11302005.pdf].

[31] For additional information on conformity, see CRS Report RL32106, *Transportation Conformity Under the Clean Air Act: In Need of Reform?*, by James E. McCarthy.

nonattainment areas prior to the availability of SIP emission budgets, EPA included provisions for interim emissions tests for conformity determinations (69 *Federal Register* 40014-40015).

Given the complexities associated with the final conformity rule, EPA provided guidance to accompany the rule. The guidance, entitled *Companion Guidance for the July 1, 2004, Final Transportation Conformity Rule: Conformity Implementation in Multi-Jurisdictional Nonattainment and Maintenance Areas for Existing and New Air Quality Standards*,[32] expands on the final conformity rule by including additional detailed examples, and interpretations for generic scenarios that are present in the field and that are expected to occur under the new standards. EPA has provided other fact sheets and summary tables, and has conducted training sessions for implementers, to further assist understanding of the requirements of the rule.[33]

On May 6, 2005, EPA published a final rule (70 *Federal Register* 24280) further amending the transportation conformity regulations by adding transportation-related $PM_{2.5}$ "precursors" and specifying when these precursors must be considered in conformity determinations before and after $PM_{2.5}$ SIPs are submitted.[34] Precursors are pollutants that react chemically in the atmosphere to form other pollutants. The transportation-related $PM_{2.5}$ precursors identified in the May 2005 rule are nitrogen oxides (NO_x), volatile organic compounds (VOCs), sulfur oxides (SO_2), and ammonia (NH_3).

Other National Air Quality Improvement Programs and Strategies. According to a December 2004 EPA report entitled *The Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003*, monitored concentrations of $PM_{2.5}$ have decreased 10% and PM_{10} concentrations have decreased 7 percent since 1999, primarily in areas with the highest concentrations.[35] EPA attributes a large portion of these decreases to the Acid Rain Program.

EPA has concluded that in many cases, $PM_{2.5}$ attainment will be reached by implementing national strategies developed under the 1999 visibility protection regulations (Regional Haze Rule; 64 *Federal Register* 35714);[36] voluntary diesel

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[32] EPA, July 2004, EPA420-B-04-012. Transportation and Regional Programs Division, Office of Transportation and Air Quality. The document is available at [http://www.epa.gov/otaq/transp/conform/420b04012.pdf].

[33] For EPA fact sheets, Q&As, and training and training material regarding the July 2004 conformity rule, see EPA's Office of Transportation and Air Quality website [http://www.epa.gov/otaq/transp/conform/2004training.htm], accessed November 22, 2005.

[34] See EPA's website at [http://www.epa.gov/otaq/transp/conform/conf-regs-d.htm].

[35] U.S. Environmental Protection Agency, EPA 454-R-04-002, December 2004. Revised report posted on EPA's website at [http://www.epa.gov/airtrends/pm.html].

[36] On July 6, 2005, EPA revised the regional haze rule, providing guidelines for determining best available retrofit technology (BART) intended to provide guidelines used by state and tribal air quality agencies to determine how to set air pollution limits (70 *Federal Register* 39172). See CRS Report RL32483 *Visibility, Regional Haze, and the Clean Air Act: Status*

(continued...)

engine retrofit programs; new federal standards, scheduled to be implemented between 2004 and 2010, on cars, light trucks, and heavy-duty diesel engines; and the 1998 regional strategy to reduce nitrogen oxides from eastern states, referred to as the "NOx SIP Call"(63 *Federal Register* 57356, October 27, 1998, and 69 *Federal Register* 21604, April 21, 2004). Primarily designed to meet the ozone NAAQS, EPA predicts the NOx SIP call will also provide benefits in terms of reduced levels of nitrate fine particles. For background on the NOx SIP Call, see CRS Report 98-236 ENR, A*ir Quality: EPA's Ozone Transport Rule, OTAG, and Section 126 Petitions — A Hazy Situation?*, by Larry Parker and John Blodgett.

On May 12, 2005, EPA published a final rule (70 *Federal Register* 25162), the Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone or "Clean Air Interstate Rule (CAIR)," to address the interstate transport of pollutants (SO_2 and NOx) that are hindering downwind states from attaining the eight-hour ozone and $PM_{2.5}$ NAAQS. The final rule covers 28 states in the eastern United States and the District of Columbia; it uses a cap-and-trade approach to reduce target pollutants by up to 70%.

Based on air quality analyses in support of the CAIR, EPA predicted that 17 of 36 areas in the eastern United States designated as nonattainment (out of compliance) with $PM_{2.5}$ NAAQS would reach attainment (come into compliance) by 2010 as a result of implementing CAIR in conjunction with other existing national programs.[37] On the other hand, the EPA analyses recognized that as many as 19 of the areas would remain in nonattainment, highlighting the importance of local and state emission reduction efforts. The extent of pollution reduction projected as a result of this rule has been the subject of considerable debate among stakeholders and some Members of Congress. For more information on the CAIR, see CRS Report RL32927, *Clean Air Interstate Rule: Review and Analysis*, by Larry B. Parker and CRS Report RL32273, *Air Quality: EPA's Proposed Interstate Air Quality Rule*, by Larry B. Parker and John E. Blodgett.

Issues

Timely Completion of a $PM_{2.5}$ Implementation Rule. Many stakeholders and some Members of Congress are concerned with the timing of EPA's completion of the implementation requirements and associated guidance for achieving and maintaining compliance with the $PM_{2.5}$ NAAQS. EPA's proposed "$PM_{2.5}$ Implementation Rule" was published on November 1, 2005 (70 *Federal Register* 65984), and the Agency has targeted mid-2006 for final promulgation. States are required to submit their SIPs by April 2008. EPA contends that many states generally have a sense of what needs to be done based on the proposal, information in the final transportation $PM_{2.5}$ conformity rule published in December 2004, and past experience with development of SIPs for other NAAQS. Although recognizing there are certain nuances associated with the $PM_{2.5}$ NAAQS and that some areas that

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[36] (...continued)
of Implementation, by Larry Parker.

[37] See page 66006 of 70 *Federal Register* 65984, November 1, 2005, *Proposed Rule To Implement the Fine Particle National Ambient Air Quality Standards*.

are in nonattainment of a NAAQS for the first time may require additional assistance, EPA believes the targeted promulgation date should allow sufficient time for states to complete their SIPs. Some states and stakeholders are less optimistic.

Impacts of Actions Regarding the 1997 Ozone NAAQS. The final PM NAAQS was signed by the EPA Administrator at the same time as new NAAQS for ground-level ozone, on July 16, 1997. The two NAAQS were jointly published on July 18, 1997 (62 *Federal Register* 38652-38896). Generally referred to as the 8-hour ozone standard, the new standard for ground-level ozone requires a more stringent concentration limit (0.08 parts per million vs. the previous 0.12), but it averages the ozone concentrations measured over 8 hours rather than the previous 1 hour. Following their joint promulgation in 1997, both the ozone and the PM NAAQS were the subject of many of the same challenges and litigation, including a Supreme Court decision in 2001 (see discussion later in this report). Implementation of the 8-hour ozone standard currently precedes the PM NAAQS implementation. See CRS Report RL32345: *Implementation of EPA's 8-Hour Ozone Standard*, by James E. McCarthy.

On April 15, 2004, EPA designated areas in 32 states and the District of Columbia (474 counties in all) as nonattainment for the new ozone air quality standard (69 *Federal Reg*ister 23857). The EPA designations, and the new implementation rule (69 *Federal Register* 23951) that accompanied the designations, have been challenged for being too lenient by several states and various public interest groups, and too restrictive by industry groups. A number of general issues, such as cost and interpretation of boundaries, are expected to be similar for the eight-hour ozone and $PM_{2.5}$ rules, but EPA deems the CAA requirements regarding $PM_{2.5}$ to be less complicated, relative to ozone requirements. The $PM_{2.5}$ implementation rule will be new rather than a transformation of an existing one, as in the case of eight-hour ozone. In addition, fewer areas have been designated as nonattainment for $PM_{2.5}$ than were designated under the eight-hour ozone NAAQS. Nevertheless, implementation of the eight-hour ozone NAAQS, and associated challenges or other delays, will likely impact the implementation of the $PM_{2.5}$ NAAQS.

Nonattainment Boundaries. EPA has generally used its discretion to expand the size of nonattainment areas, or to combine areas that a state listed as separate areas into a single larger unit. As it did in implementing other NAAQS, EPA has also combined nonattainment counties across state lines into the same nonattainment area, if the counties are part of the same metropolitan area. Although, according to EPA, staff in the regions and the agency's Office of Air Quality Planning and Standards were available for assistance and consultation throughout the designation process pursuant to the statutory requirements for working with states, some states continue to disagree with EPA's final designations relative to the states' own recommendation.

Upwind Pollutant Contributions. One of the more frequently raised issues in nonattainment areas is whether any special consideration can be given to areas whose air quality is adversely affected by pollution from upwind areas. Unlike the larger coarse particles which generally settle more rapidly and fall near their source of emission, the smaller $PM_{2.5}$ particles frequently remain in the atmosphere longer and can travel significant distances from their original source. The transport of $PM_{2.5}$

can contribute to, and in some cases be the primary cause of, nonattainment in areas downwind of the emission source.

Subpart 1 of the CAA allows EPA to "classify the area for the purpose of applying an attainment date" and consider such factors as "the availability and feasibility of pollution control measures," and may provide the Agency flexibility. As referenced in the proposed $PM_{2.5}$ implementation rule, areas also may petition the Agency under Section 126 of the CAA to impose controls on upwind sources that significantly contribute to their nonattainment of the standard.[38] The Agency has imposed additional controls on sources of nitrogen oxides (which contribute to PM and ozone formation downwind) through its "NOx SIP Call" and the "Regional Haze Rule."[39] In addition, the CAIR, promulgated in May 2005, is intended to address interstate transport of pollutants that hinder attainment of $PM_{2.5}$ and eight-hour ozone NAAQS in downwind states

Identifying Sources and Control Measures. Determining sources contributing to emission of fine particles to identify the appropriate actions for compliance with the $PM_{2.5}$ standards is expected to be complicated. EPA has been conducting several technical studies in an effort to develop extensive guidance to assist states in identifying appropriate control measures in their SIPs for specific parameters and conditions. The proposed $PM_{2.5}$ implementation rule provides information related to this concern as well.

Economic Impacts. Another concern, particularly of local businesses and governments in areas with nonattainment designations, are the potential negative impacts on an area's economic development. Nonattainment designation does require new major sources of pollution to offset their pollution by equivalent or greater emission reductions from existing sources, and requires highway and transit planners to demonstrate that new projects "conform" to the area's SIP.[40] Although EPA has not analyzed the potential economic impact of designating areas as nonattainment for particulate matter, a 2002 EPA analysis[41] found that ozone nonattainment designations had no net negative impact on those areas. Specifically, 6.5 million jobs were created in ozone nonattainment areas from 1990 to 1998, and "over 55 percent of ozone nonattainment areas had average annual employment growth rates greater than that of their region of the country." Personal income

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[38] A number of such petitions regarding NAAQS other than $PM_{2.5}$ have been filed with the Agency. The most well-known are those that were filed in August 1997 by eight northeastern states, four of which were granted by the Agency in January 2000. See CRS Report 98-236, *Air Quality: EPA's Ozone Transport Rule, OTAG, and Section 126 Petitions — A Hazy Situation?*, by Larry Parker and John Blodgett.

[39] The Regional Haze Rule establishes Best Available Retrofit Technology (BART) at stationary sources in 26 industrial categories; available at [http://www.epa.gov/visibility/actions.html].

[40] For additional information on conformity, see CRS Report RL32106, *Transportation Conformity Under the Clean Air Act: In Need of Reform?*

[41] U.S. EPA, *Office of Air and Radiation, "The Historical Record: Nonattainment Status and Economic Growth*," February 26, 2002.

growth in these nonattainment areas essentially matched the national average between 1990 and 1998, according to EPA (38.5% vs. 38.9%).

In contrast to the EPA findings, a study conducted by NERA Economic Consulting for the American Petroleum Institute (API), found that meeting the 2010 ozone attainment deadline will lead to a $3 billion reduction in economic output in the Philadelphia region in 2011.[42] According to an API summary[43] of the report, "The economic impacts would include the cost of local controls of $3.9 billion per year, the loss of thousands of regional jobs, a reduction of billions of dollars in gross regional product, and a significant loss of disposable personal income in the area." The API summary indicates that delaying the eight-hour ozone NAAQS attainment deadline to 2015 would lower the cost to the local economy to $100 million per year and lead to 1,000 fewer jobs. The extent to which the analysis supporting these findings has been subjected to the rigorous peer review process typical for publication in a scientific journal has been a concern to some.[44]

Grant Programs. Although EPA does not have a grant program specifically designed to assist nonattainment areas, the agency provides several grants to state air pollution agencies in support of their programs. Other sources of funding are also available. For example, states may obtain funding for projects intended to contribute to attainment or maintenance of NAAQS under the Department of Transportation's (DOT's) Congestion Mitigation and Air Quality Improvement program (CMAQ). Congress authorized $8.6 billion for the program for FY2005-FY2009 under the Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU, P.L. 109-59), signed into law August 10, 2005.

Authorized initially by Congress under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240) and funded by the Highway Trust Fund, CMAQ provides funding for surface transportation and other related projects that contribute to air quality improvements and congestion mitigation. In particular, the program is authorized to fund projects that contribute to the reduction of carbon monoxide (CO) and ozone concentrations. CMAQ funds are apportioned to a state based on its population and pollution reduction needs. The population of each nonattainment or maintenance area for ozone and/or CO in a state is multiplied by a weighting factor based on the level of nonattainment (e.g., moderate, serious, severe). States with no maintenance or nonattainment areas for ozone or CO are guaranteed a minimum of 0.5% of each fiscal year's authorized CMAQ funds.

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[42] Economic Impact of 8-Hour Ozone Attainment Deadlines on Philadelphia Region, September 2005 (released November 7, 2005); available on the API website at [http://api-ec.api.org/filelibrary/NERA_API_Philadelphia_Report.pdf].

[43] Available at [http://api-ep.api.org/economics/index.cfm?bitmask=002003002000000000].

[44] Testimony of James Werner, Director, Division of Air and Waste Management, Delaware Department of Natural Resources and Environmental Control, before the U.S. Senate Committee on Environment and Public Works, Subcommittee on Clean Air, Climate Change, and Nuclear Safety, *Implementation of the Existing Particulate Matter and Ozone Air Quality Standards*, November 10, 2005.

CMAQ was expanded to allow the use of funds for projects intended to reduce PM concentrations under the Transportation Equity Act for the 21st Century (TEA-21, P.L. 105-178). TEA-21 did not, however, change the apportionment formula that is based on CO and ozone. States with maintenance or nonattainment areas for *only* PM receive the guaranteed minimum. For a more detailed discussion of CMAQ and relevant legislation, see CRS Report RL33057, *Surface Transportation Reauthorization: Environmental Issues and Legislative Provisions in SAFETEA-LU (H.R. 3)*, by Linda Luther.

EPA's Review of the 1997 PM Standards and Proposed Changes.[45] At the end of 2005, EPA completed its statutorily required[46] review and assessment of latest relevant scientific studies to either reaffirm or modify the PM NAAQS. Based on the review, EPA announced a proposal to change NAAQS for particulate matter (PM) on December 20, 2005 (71 *Federal Register* 2620, January 17, 2006), to provide increased protection against potential health effects (including chronic respiratory disease and premature mortality) associated with short- and long-term exposure to particulate matter. Given the simultaneity of this proposal and the ongoing implementation of the current standards, outcomes and challenges associated with the review and the EPA's decision regarding changes to the existing PM NAAQS could affect the implementation schedule. By consent agreement,[47] EPA is to finalize its decision regarding the PM NAAQS by September 27, 2006.

Based on its review and analysis of numerous scientific studies available between 1997 and 2002,[48] and on determinations made by the Administrator, EPA's proposal would tighten the current standard primarily by lowering the daily (24-hour) standard for fine particles smaller than 2.5 microns ($PM_{2.5}$). The proposal would also modify the standards for inhalable coarse particles smaller than 10 microns but larger than 2.5 microns ($PM_{10-2.5}$). Several public interest groups and scientists, including the EPA independent Clean Air Scientific Advisory Committee (CASAC),[49] advocated tightening the standards further than proposed. Others contend that data do not support the stricter standards nor, in some cases, the 1997 standards.

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[45] For status of EPA's review and prosed changes to the PM NAAQS see CRS Report RL31531, *Air Quality: EPA's Proposed Changes to the Particulate Matter (PM) Standard* by Robert Esworthy and James E. McCarthy. Information can also be accessed on EPA's website [http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html].

[46] Section 109(d)(1)) of the CAA.

[47] Consent Agreement, July 2003, C.A. No. 03-778 (ESH). *American Lung Association, et al. v. EPA et al*, U.S. District Court for the District of Columbia, as modified.

[48] EPA "*Air Quality Criteria for Particulate Matter*," October 29, 2004,EPA. "*Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information, OAQPS Staff Paper*," Office of Air Quality Planning and Standards, EPA-452/R-05-005, July 2005. The EPA criteria document and staff paper can be on at [http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_cr_sp.html].

[49] The CASAC, mandated under Section 109(d)(2) of the CAA, reviews EPA's NAAQS criteria documents and staff papers as they are prepared; recommends improvements; and, after further meetings and reviews, signs off only when it is convinced that each accurately reflects the status of the science.

Tightening the PM NAAQS is expected to result in more areas classified as "nonattainment" and needing to implement new controls on particulate matter. States and local governments would be required to develop and implement new plans for addressing emissions in those areas that do not meet any new standards. A stricter standard may mean more costs for the transportation and industrial sectors, including utilities, refineries, and the trucking industry, affected by particulate matter controls. In terms of public health, a stricter standard may mean fewer health effects for the general population and particularly sensitive populations, such as children, asthmatics, and the elderly.

EPA's previous review and establishment of PM standards was the subject of litigation and challenges, including a Supreme Court decision in 2001. It would not be surprising if interested parties return to the courts or initiate challenges after the agency promulgates final standards. These challenges could affect the current implementation schedule as well. However, the final form of the current efforts to revise PM NAAQS, and therefore the associated potential impacts of implementation of the existing $PM_{2.5}$ standards, may not be known for some time.

Legislation Related to PM NAAQS Implementation

Concerns regarding the potential impacts of the new ozone and particulate standards have led to several attempts to modify the implementation requirements.[50] Recent legislative attempts during the 109th Congresses were generally attached to larger pieces of legislation, such as the proposed multipollutant ("Clear Skies"), energy, and transportation bills.

The Energy Policy Act of 2005 (P.L. 109-58), signed by the President on August 8, 2005, includes provisions that could affect NAAQS implementation through programs that could contribute to reductions in PM (and ozone). Title VII Subtitle G requires EPA to establish a program to provide grants and loans to retrofit vehicles with diesel engines with new emission reduction technology. Eligible vehicles include heavy-duty trucks, locomotives, and boats. Subtitle G, referred to as the "Diesel Emissions Reduction Act (DERA) of 2005" (the same as the proposed stand-alone legislation S. 1265, S. Report 109-133), authorizes $200 million annually for FY2007 through FY2011 (Title VII Subtitle G Section 797). Other provisions may also contribute to reducing PM to some extent. For example, Title XVI establishes a program to promote the development and deployment of low-carbon technologies, both domestically and in developing countries. Various sections in Titles VII, VIII, and XIII authorize R&D funding for hydrogen, fuel cells, and alternative fuel vehicles or establish tax incentives for their use. See CRS Report RL32873, *Key Environmental Issues in the Energy Policy Act of 2005 (P.L. 109-58, H.R. 6)*, by Brent D. Yacobucci.

Multipollutant legislation to reduce emissions from coal-fired power plants, if enacted, might also reduce $PM_{2.5}$ concentrations and could also revise the attainment

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[50] See CRS Issue Brief IB10107, *Clean Air Act Issues in the 108th Congress* (available from the author), and CRS Issue Brief IB10137, *Clean Air Act Issues in the 109th Congress*, by James E. McCarthy.

process. In the 109th Congress, six bills have been introduced that would impose multipollutant controls on utilities. Two of the bills, H.R. 227 and S. 131 (Clear Skies), are modified versions of the Administration's three-pollutant proposal for sulfur dioxide (SO_2), nitrogen oxides (NOx), and mercury (Hg) emissions . The other four bills, S. 150, S. 730, H.R. 1451, and H.R. 1873, are four-pollutant proposals that include carbon dioxide (CO_2). In addition to the effects of reducing emissions of the pollutants of concern on $PM_{2.5}$, "Clear Skies" legislation would create a new "transitional" area classification in place of nonattainment for areas that can demonstrate through modeling that they will attain the $PM_{2.5}$ and ozone standards by December 2015. Until that date, transitional areas would not incur penalties or face additional requirements beyond those identified in the EPA or state modeling. After 2015, if an area failed to achieve the standard, it would be designated nonattainment by June 2017 and would then have to impose controls to reach attainment by 2022. By reclassifying most ozone and $PM_{2.5}$ nonattainment areas as "transitional," Clear Skies would eliminate the application of conformity in those areas until 2018.

The Senate Environment and Public Works Committee blocked S. 131 from advancing to the Senate floor, on a tie vote March 9, 2005. The committee's 9-9 vote brought an end, possibly for the remainder of the 109th Congress, to further attempts to find a compromise on Clear Skies amendments. See CRS Report RL32782, *Clear Skies and the Clean Air Act: What's the Difference?*, by Larry B. Parker and James E. McCarthy, and CRS Report RL32755, *Air Quality: Multi-Pollutant Legislation in the 109th Congress*, by Larry B. Parker and John E. Blodgett.

$PM_{2.5}$ NAAQS Implementation Timeline and Delays

Due to legal challenges, the lack of a national monitoring network, and other factors, implementation of the $PM_{2.5}$ NAAQS has been delayed since it was promulgated. The timeline presented in **Table 2**, primarily driven by statutory requirements, reflects the most recent key milestone dates for $PM_{2.5}$ implementation, including actual completions. It follows an EPA milestone schedule outlined in an April 21, 2003, memorandum to EPA Regional Administrators, which also provided the nonbinding guidance for implementation of the $PM_{2.5}$ area designations.[51] Recognizing potential efficiencies associated with states and tribes being able to harmonize future control strategies, the initial $PM_{2.5}$ schedule was intended to be similar to the eight-hour ozone program.

[51] EPA memorandum, April 21, 2003, from the Office of Air and Radiation Assistant Administrator Jeffrey R. Holmstead to EPA Regional Administrators, [http://www.epa.gov/ttn/naaqs/pm/pm25_guide.html], accessed January 2006.

Table 2. Estimated Schedule for $PM_{2.5}$ NAAQS Implementation

Date	$PM_{2.5}$ NAAQS Milestones
February 2004 (completed)	State/tribal area designation recommendations (based on 2000-2002 monitoring data)
June-July 2004 (completed)	EPA notifies states/tribes regarding modifications to states/tribes' recommendations
January 5, 2005 (completed) (published in 70 *Federal Register* 944)	EPA promulgates final area designations (required 1 year after states/tribes' recommendations)
February 2005 (completed November 1, 2005) (published in 70 *Federal Register* 65984)	EPA proposes $PM_{2.5}$ implementation rule
April 5, 2006 (1 year after the final designation April 5, 2005 effective date)	States must submit transportation conformity determination within one year of the effective date of nonattainment designation (per EPA's final "conformity rule," published July 1, 2004)
Mid 2006	EPA promulgates final $PM_{2.5}$ implementation rule
April 2008 (3 years after final area designations)	States/tribes submit revised implementation plans (SIPs) to achieve $PM_{2.5}$ compliance in nonattainment areas
2010-2015 (5-10 years after final area designations)	NAAQS statutory compliance deadline for attainment

Source: Prepared by the Congressional Research Service based on U.S. Environmental Protection Agency fact sheets and guidance documents, and relevant *Federal Register* notices.

The $PM_{2.5}$ requirement of three years of monitoring data to determine whether areas are meeting the established limits is one factor responsible for delaying implementation. Comprehensive monitoring data sufficient to make this determination and the attainment designations were not available in 1997. Recognizing this dilemma, in the 1998 Transportation Equity Act for the 21st Century (TEA-21; P.L. 105-178, Title VI), Congress revised the statutory deadline requirements for the new NAAQS, predicated on a previously released EPA Interim Implementation Policy. TEA-21 required states to submit designation recommendations within one year after receipt of three years of data meeting defined federal protocols, and EPA to promulgate designations within one year after state recommendations are due but not later than December 31, 2005.

As discussed earlier, operation of the network of monitors was phased in from 1999 through 2000, making three-year monitoring data available at different points, depending on area location. Rather than a staggered designation schedule, which would likely result in hampering cross-coordination of implementation plans, the EPA proposed a single date for state/tribal recommendations and final EPA designations. The deadlines of February 15, 2004, for Governors to submit their $PM_{2.5}$ designation recommendations and December 31, 2004, for EPA to promulgate designations for each state were the result of Congress amending the CAA in the FY2004 omnibus appropriations (P.L.108-199).

In addition to the delay in establishing a monitoring network, the NAAQS standards were challenged in District Court by the American Trucking Associations, the U.S. Chamber of Commerce, and several other state and business groups. An initial May 1999 opinion by the District Court partially in favor of the plaintiffs was reversed by the Supreme Court in February 2001.[52]

Conclusion

Implementation of the $PM_{2.5}$ NAAQS is affecting a number of areas, including some that have not previously been designated "nonattainment" for a NAAQS. A number of concerns have been raised regarding the potential impacts, and numerous questions have been triggered regarding the specifics of the implementation process.

EPA projects that federal measures, such as recent auto and truck emission standards and controls on power plants and regional regulations, will be sufficient to demonstrate attainment in a large portion of monitored nonattainment counties by 2015, prior to the development and implementation of local measures. Some Members of Congress, and others, have questioned the EPA's predictions regarding the relative magnitude of the emission reductions associated with existing and proposed air quality controls. There is also considerable debate regarding potential economic consequences associated with nonattainment.

The final form of $PM_{2.5}$ implementation and its effects may not be known for some time. Some states and other stakeholders continue to disagree with EPA's $PM_{2.5}$ nonattainment area designations and suggest fewer counties should have been designated. Other stakeholder groups contend that the EPA should have included additional counties. The agency's $PM_{2.5}$ implementation rule, which was recently proposed, may be challenged (like many EPA rules) in the courts. EPA's first attempt at an implementation plan was among the issues remanded by the Supreme Court in a 2001 decision that addressed a number of issues related to the setting of the $PM_{2.5}$ and the eight-hour ozone standard. Challenges following the eight-hour ozone designations could also affect certain decisions and the schedule regarding $PM_{2.5}$. The EPA's ongoing review of the current PM NAAQS and the resulting proposed changes standards may face challenges that could affect implementation of the $PM_{2.5}$ NAAQS. Modification of the statutory provisions affecting implementation of the current ozone and particulate standards, through regulation or legislation, is likely to remain under consideration.

Many critical milestones are scheduled to be completed in the coming months, and $PM_{2.5}$ will likely remain an area of focus for many stakeholders and Congress for the remainder of 2005 and throughout 2006.

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[52] United States Court of Appeals for the District of Columbia Circuit, argued December 17, 1998; decided May 14, 1999 (No. 97-1440). *American Trucking Associations, Inc., et al., Petitioners v. United States Environmental Protection Agency*; *Whitman v. American Trucking Associations*, U.S. Supreme Court, No. 99-1257 and No. 99-1426, February 27, 2001 (121 S. Ct. 903). See CRS Report RS20860, *The Supreme Court Upholds EPA Standard Setting Under the Clean Air Act: Whitman v. American Trucking Assn's*.