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Report to Congressional Requesters

May 2005

CLEAN AIR ACT

EPA Has Completed Most of the Actions Required by the 1990 Amendments, but Many Were Completed Late

GAO-05-613

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GAO Accountability·Integrity·Reliability

Highlights

Highlights of GAO-05-613, a report to congressional requesters

Why GAO Did This Study

While air quality in the United States has steadily improved over the last few decades, more than a hundred million Americans continue to live in communities where pollution causes the air to be unhealthy at times, according to the Environmental Protection Agency (EPA). The Clean Air Act, first passed in 1963, was last reauthorized and amended in 1990, when new programs were created and changes were made to the ways in which air pollution is controlled. The 1990 amendments included hundreds of requirements for EPA, as well as other parties, to take steps that will ultimately reduce air pollution. The amendments also established deadlines for many of these requirements. Since the 1990 amendments, various actions have been proposed to either amend the Clean Air Act or implement its provisions in new ways.

GAO was asked to report on the current status of EPA's implementation of requirements under Titles I, III, and IV of the 1990 amendments. These titles, which address national ambient air quality standards, hazardous air pollutants, and acid deposition control, respectively, are the most relevant to proposed legislation and recently finalized regulations addressing emissions of air pollutants by power plants.

www.gao.gov/cgi-bin/getrpt?GAO-05-613.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

What GAO Found

As of April 2005, EPA had completed 404 of the 452 actions required to meet the objectives of Titles I, III, and IV of the Clean Air Act Amendments of 1990. Of the 338 requirements that had statutory deadlines prior to April 2005, EPA completed 256 late: many (162) 2 years or less after the required date, but others (94) more than 2 years after their deadlines. Consequently, improvements in air quality associated with some of these requirements may have been delayed. The numerous actions required to implement these titles varied in scope and complexity. For example, these actions included reviewing numerous state plans to comply with national health- and welfare-based air quality standards for six major pollutants, setting technology-based standards to reduce emissions from sources of hazardous air pollutants, and developing a new program to reduce acid rain. EPA officials cited several reasons for the missed deadlines, including the emphasis on stakeholders' involvement during regulatory development, which added to the time needed to issue regulations; the need to set priorities among the tremendous number of new responsibilities EPA assumed as a result of the 1990 amendments, which meant that some actions had to be delayed; and competing demands caused by the workload associated with EPA's response to lawsuits challenging some of its rules.

Of the 48 requirements EPA had not met as of April 2005, 45 had associated deadlines, and 3 did not. The unmet requirements include 15 Title I requirements to promulgate regulations to limit the emissions of volatile organic compounds from a number of consumer and commercial products, such as household cleaners and pesticides. According to EPA officials, these rules were not completed because EPA shifted its priorities toward issuing standards related to the emissions of hazardous air pollutants regulated under Title III. However, the unmet requirements also include actions under Title III to periodically assess whether EPA's emissions standards for sources that emit significant amounts of hazardous air pollutants appropriately protect public health. These "residual risk" assessments are to be made within 8 years of the setting of each of the emissions standards, and 19 of these assessments are now past the 8-year mark. EPA completed the first of these residual risk assessments in March 2005. Any improvements in air quality that would result from EPA meeting these requirements remain unrealized.

In commenting on a draft of this report, EPA generally agreed with our findings and provided supplemental information, primarily on the benefits of the Clean Air Act Amendments of 1990 and the reasons for implementation delays (see app. V).

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Abbreviations

EPA	Environmental Protection Agency
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
SIP	State Implementation Plan

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United States Government Accountability Office
Washington, D.C. 20548

May 27, 2005

The Honorable James M. Inhofe
Chairman
Committee on Environment and Public Works
United States Senate

The Honorable George V. Voinovich
Chairman
Subcommittee on Clean Air, Climate Change, and Nuclear Safety
Committee on Environment and Public Works
United States Senate

Exposure to air pollution is associated with numerous effects on human health, including respiratory problems, heart and lung diseases resulting in hospitalization, and even premature death. While air quality in the United States has steadily improved over the last few decades, more than a hundred million Americans continue to live in communities where pollution causes the air to be unhealthy at times, according to the Environmental Protection Agency (EPA). The Clean Air Act, first passed in 1963, was last reauthorized and amended by the Congress in 1990, when new programs were created and changes were made to the ways in which air pollution is controlled. For example, the 1990 amendments created a market-based "cap-and-trade" program to reduce the adverse effects of acid rain deposition by capping emissions of sulfur dioxide nationwide and allowing electric power plants the flexibility to either achieve emissions reductions themselves or purchase allowances from plants that have achieved greater reductions than required. In addition, the 1990 amendments required EPA to take numerous actions, such as creating national technology-based standards for hazardous air pollutants;[1] issuing new regulations and guidance documents; undertaking research studies; and preparing reports to the Congress.

[1]Maximum achievable control technology (MACT) standards are technology-based standards developed to control the emissions of certain air toxics from numerous industry source categories and are based on emissions levels that are already being achieved by the better-controlled and lower-emitting sources in each category.

As we reported in 2000, the first six titles of the 1990 amendments included hundreds of requirements for EPA and other parties—such as states and local governments—to take steps that will ultimately reduce air pollution.[2] The amendments also established deadlines for many of these requirements. We further reported that EPA had met many of the requirements by February 2000, but that the agency had missed statutory deadlines for most of the requirements that were met. Some of the requirements EPA had not yet met had statutory deadlines after February 2000.

In recent years, EPA and the Congress have sought to achieve further reductions in the emissions of sulfur dioxide and nitrogen oxides from power plants in order to, among other things, help improve air quality in communities that do not meet EPA's health-based standards for major pollutants. In addition, EPA and the Congress have sought to reduce mercury emissions from coal-fired power plants for the first time. In fact, in March 2005, EPA issued two regulations—the Clean Air Interstate Rule and the Clean Air Mercury Rule—addressing these pollutants. The interstate rule permanently caps emissions of sulfur dioxide and nitrogen oxides in 28 eastern states and the District of Columbia, and the mercury rule sets nationwide limits on mercury emissions from coal-fired power plants. In these rules, EPA uses the cap-and-trade approach to allow power plants to either reduce emissions or buy allowances from other power plants that have reduced their emissions below their limit. As you know, certain proposals of the current session of Congress, such as the "Clear Skies" bill, would similarly impose reductions of sulfur dioxide, nitrogen oxides, and mercury, though they would do so on a nationwide basis for all three pollutants.[3] Some proponents of the legislative approach to controlling emissions have argued that legislation that specified emissions reduction levels may be subject to fewer legal challenges than EPA-promulgated regulations developed under broader statutory authorities. Along these lines, we note that on the day EPA issued the mercury rule, attorneys general for nine states initiated a lawsuit challenging various aspects of this rule.

[2]GAO, *Air Pollution: Status of Implementation and Issues of the Clean Air Act Amendments of 1990*, GAO/RCED-00-72 (Washington, D.C.: April 17, 2000).

[3]Versions of the Clear Skies proposal are represented by bills S. 131 and H.R. 227. Bills that differ, among other aspects, in that they would also cap carbon dioxide, include S.150 and H.R. 1451.

In this context, you asked us to report on the current status of EPA's implementation of requirements under Titles I, III, and IV of the Clean Air Act Amendments of 1990, which address national ambient (outdoor) air quality standards, hazardous air pollutants, and acid deposition control, respectively, and are the most relevant to the recent regulations and proposed legislation addressing emissions of air pollutants by power plants.

To obtain information on the status of EPA's implementation of Titles I, III, and IV of the Clean Air Act Amendments of 1990, we spoke with EPA officials knowledgeable about EPA's workload related to these titles. These officials verified a list of the requirements related to each title for accuracy and completeness and provided documentation for any changes made to the list. This list had originally been developed as evidence for GAO's 2000 report on the status of EPA's implementation of the 1990 amendments.[4] In addition, EPA officials provided explanations and documentation for requirements that had not been met as of April 2005. This report focuses on the extent to which EPA has met its requirements with statutory deadlines prior to April 2005 and those without statutory deadlines related to Titles I, III, and IV under the 1990 amendments, but does not show the extent to which the states have implemented applicable requirements. A more detailed description of our scope and methodology is presented in appendix IV. We conducted our work from January 2005 to May 2005 in accordance with generally accepted government auditing standards.

Results in Brief

As of April 2005, EPA had completed all but 48 of the 452 actions that the agency identified as required to meet the objectives of Titles I, III, and IV of the Clean Air Act Amendments of 1990. The number, scope, and complexity of the required actions under each of these titles varied widely, and these differences, along with other challenges EPA faced, led to varying timeliness in implementing these requirements. Some of the major actions that EPA has taken related to these three titles include reviewing state plans for achieving national health- and welfare-based standards for six major air pollutants, developing technology-based standards for 174 separate categories of sources of hazardous air pollutants, and implementing a market-based cap-and-trade program to reduce emissions of sulfur dioxide from power plants. Of the 404 actions completed, 338 had

[4]See footnote 2.

statutory deadlines prior to April 2005, most of which EPA did not meet on time. In fact, EPA completed 256 of these actions late: many (162) 2 years or less after the required date, but others (94) more than 2 years after their deadlines. Consequently, improvements in air quality associated with some of these requirements may have been delayed. According to EPA officials, the agency missed these deadlines for several reasons, including an emphasis on stakeholders' review and involvement during regulatory development; the necessity to set priorities among the actions required of EPA resulting from the 1990 amendments; and competing demands caused by the workload associated with EPA's response to lawsuits challenging some of its rules. EPA officials explained that 45 of the requirements with statutory deadlines were still unmet as of April 2005 because of competing priorities, among other factors. For example, 15 requirements for EPA to limit emissions of volatile organic compounds from various products, such as cleaning products and insecticides, were not completed because the agency shifted its priorities toward implementing standards related to the emissions of hazardous air pollutants regulated under Title III, according to EPA officials. In addition, EPA has not implemented 19 actions required under Title III to assess whether EPA's emissions standards for certain sources of hazardous air pollutants appropriately protect public health. Any improvements in air quality that would result from EPA meeting these requirements remain unrealized.

Background

The Clean Air Act, a comprehensive federal law that regulates air pollution from stationary and mobile sources, was passed in 1963 to improve and protect the quality of the nation's air. The act was substantially overhauled in 1970 when the Congress required EPA to establish national ambient air quality standards for pollutants at levels that are necessary to protect public health with an adequate margin of safety and to protect public welfare from adverse effects. EPA has set such standards for ozone, carbon monoxide, particulate matter, sulfur oxides, nitrogen dioxide, and lead. In addition, the act directed the states to specify how they would achieve and maintain compliance with the national standard for each pollutant. The Congress amended the act again in 1977 and 1990. The 1977 amendments were passed primarily to set new goals and dates for attaining the standards because many areas of the country had failed to meet the deadlines set previously. The act was amended again in 1990 when several new themes were incorporated into it, including encouraging the use of market-based approaches to reduce emissions, such as cap-and-trade programs.

The major provisions of the 1990 amendments are contained in the first six titles. As requested, this report addresses EPA's actions related to Titles I, III, and IV:[5]

- Title I establishes a detailed and graduated program for the attainment and maintenance of the national ambient air quality standards;
- Title III expands and modifies regulations of hazardous air pollutant emissions and establishes a list of 189 hazardous air pollutants to be regulated;
- Title IV establishes the acid deposition control program to reduce the adverse effects of acid rain by reducing the annual emissions of pollutants that contribute to it.[6]

Although the Clean Air Act is a federal law, states and local governments are responsible for carrying out certain portions of the statute. For example, states are responsible for developing implementation plans that describe how they will come into compliance with national standards set by EPA. EPA must approve each state's plan, and if an implementation plan is not acceptable, EPA may assume enforcement of the Clean Air Act in that state. Once EPA sets a national standard, it is generally up to state and local air pollution control agencies to enforce the standard, with oversight from EPA. For example, state air pollution control agencies may hold hearings on permit applications by power or chemical plants. States may also fine companies for violating air pollution limits.

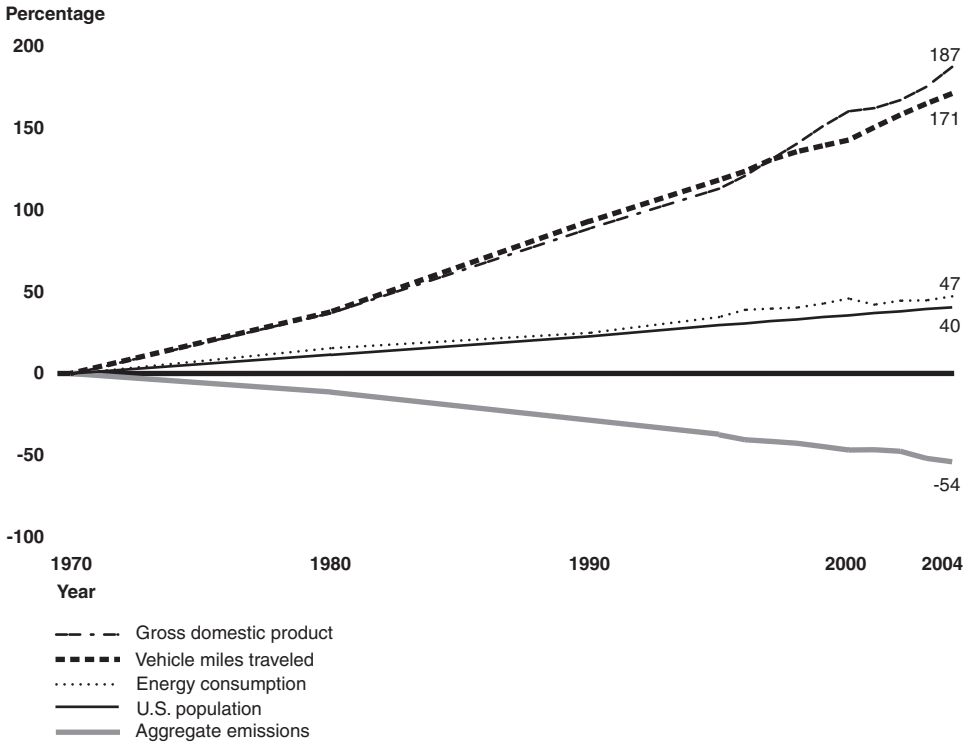
According to EPA, by many measures, the quality of the nation's air has improved in recent years. Each year EPA estimates emissions that impact the ambient concentrations of the six major air pollutants for which EPA sets national ambient air quality standards. EPA uses these annual emissions estimates as one indicator of the effectiveness of its air programs. As figure 1 shows, according to EPA, between 1970 and 2004,

[5]Other titles contain provisions for controlling air pollution from motor vehicles, engines, and their fuel (Title II), establishing a national permit program to ensure compliance with all applicable requirements of the act (Title V), and protecting the stratospheric ozone layer (Title VI).

[6]Acid rain is the result of sulfur dioxide and nitrogen oxides reacting in the atmosphere with water and returning to earth as rain, fog, or snow. Acid rain is also referred to as acid deposition, which is the process by which acidic particles, gases, and precipitation leave the atmosphere.

gross domestic product, vehicle miles traveled, energy consumption, and U.S. population all grew; during the same time period, however, total emissions of the six principal air pollutants dropped by 54 percent.

Figure 1: Comparison of Growth Areas and Emissions of Six Air Pollutants[a] in the United States



Source: EPA.

[a]Ozone, carbon monoxide, particulate matter, sulfur oxides, nitrogen dioxide, and lead.

Note: This figure represents data for the years 1970, 1980, 1990, and 1995 through 2004.

Despite this progress, large numbers of Americans continue to live in communities where pollution sometimes exceeds federal air quality standards for one or more of the six principal air pollutants. For example, EPA reported in April 2004 that 159 million people lived in areas of the United States where air pollution sometimes exceeds federal air quality standards for ground-level ozone.[7] According to EPA, exposure to ozone has been linked to a number of adverse health effects, including significant decreases in lung function; inflammation of the airways; and increased respiratory symptoms, such as cough and pain when taking a deep breath. Moreover, in 2003, 62 million people lived in counties where monitors showed particle pollution levels higher than national particulate matter standards, according to a December 2004 EPA report.[8] Long-term exposure to particle pollution is associated with problems such as decreased lung function, chronic bronchitis, and premature death. Even short-term exposure to particle pollution—measured in hours or days—is associated with such effects as cardiac arrhythmias (heartbeat irregularities), heart attacks, hospital admissions or emergency room visits for heart or lung disease, and premature death.

EPA Has Implemented Almost All Required Actions, but Many Were Implemented Late

EPA identified 452 actions required to meet the objectives of Titles I, III, and IV of the Clean Air Act Amendments of 1990. About half of these required actions were included under Title III, which also included the largest number of requirements with statutory deadlines. As shown in table 1, the 1990 amendments specified statutory deadlines for 338 of the Title I-, III-, and IV-related requirements.

[7]EPA, *The Ozone Report: Measuring Progress through 2003* (EPA 454/ K-04-001, April 2004). These "nonattainment" areas included areas that had violated the ozone standard or contributed to violations of this standard.

[8]EPA, *The Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003* (EPA 454-R-04-002, December 2004).

Table 1: Requirements with and without Statutory Deadlines as of April 2005, by Related Title

Type of requirement	Title I	Title III	Title IV	Total
Requirements with statutory deadlines	83	229	26	**338**
Requirements without statutory deadlines	88	8	18	**114**
Total	**171**	**237**	**44**	**452**

Source: GAO analysis of EPA data.

Note: This table does not include data on certain Title III actions—residual risk and other reviews with deadlines after April 2005.

The numerous actions required to meet the objectives of Titles I, III, and IV of the 1990 amendments vary in scope and complexity. For example, Title I of the Clean Air Act requires EPA to periodically review and revise, as appropriate, the national health- and welfare-based standards for air quality. After EPA revises any one of these standards, states are responsible for developing plans that detail how they will achieve the revised standard. EPA then must review the individual state plans for each standard and decide whether to approve them. While EPA must review and approve all individual state plans submitted, each set of reviews is only counted as one action. Other Title I requirements, on the other hand, only require EPA to publish reports on air quality and emission trends. While the reports may represent a significant amount of effort, the steps required to implement national ambient air quality standards are inherently more difficult to accomplish and often require parties independent of EPA, such as state and local agencies, to pass legislation and issue, adopt, and implement rules. Comparing the requirements among titles also shows how they vary in complexity. For example, Title IV required EPA to develop a new market-based cap and trade program to reduce emissions of sulfur dioxide and a rate-based program to reduce emissions of nitrogen oxides from power plants. While developing the cap and trade program was a large undertaking on EPA's part, it involved regulating a specified number of stationary sources in a single industry. In contrast, under Title III, EPA is required to implement technology-based standards for 174 separate categories of sources of hazardous air pollutants, involving many industries.

As shown in table 2, a large portion of the requirements with statutory deadlines related to Titles I, III, and IV were met late. That is, 256 of the 338 requirements with statutory deadlines have been completed but were late.

Of the 114 requirements without statutory deadlines, all but 3 of the requirements have been completed.

Table 2: Status of Title I-, III-, and IV-Related Requirements as of April 2005

Type of requirement	Title I	Title III	Title IV	Total
Requirements with statutory deadlines				
Met on time	16	13	8	**37**
Met late	45	195	16	**256**
Unmet – deadlines prior to April 2005	22	21	2	**45**
Subtotal	**83**	**229**	**26**	**338**
Requirements without statutory deadlines				
Completed	85	8	18	**111**
Not completed	3	0	0	**3**
Subtotal	**88**	**8**	**18**	**114**
Total	**171**	**237**	**44**	**452**

Source: GAO analysis of EPA data.

Note: This table does not include data on certain Title III actions—residual risk and other reviews with deadlines after April 2005.

On average, EPA met the requirements related to Titles I, III, and IV about 24, 25, and 15 months after their statutory deadlines, respectively. Of the 256 requirements that EPA met late, 162 were met within 2 years of their statutory deadline and 94 were completed more than 2 years after their deadlines (see table 3). Consequently, improvements in air quality associated with some of these requirements may have been delayed.

Table 3: Length of Time by which EPA Missed Deadlines for Title I-, III-, and IV-Related Requirements

Length of time	Title I	Title III	Title IV	Total
Up to 12 months	24	41	10	**75**
13 to 24 months	9	75	3	**87**
25 to 36 months	4	50	2	**56**
Over 36 months	8	29	1	**38**
Total	**45**	**195**	**16**	**256**

Source: GAO analysis of EPA data.

EPA officials cited several factors to explain why the agency missed deadlines for so many requirements. Among these factors was an emphasis on stakeholders' review and involvement during regulatory development, which added to the time needed to issue regulations. For example, according to an EPA official, the process to develop an early technology rule under Title III involved protracted negotiations among EPA, industry groups, a labor union, and environmental groups. The rule was finalized in October 1993, 10 months after its statutory deadline. In addition, EPA officials mentioned the need to set priorities among the tremendous number of new requirements for EPA resulting from the 1990 amendments, which meant that some of these actions had to be delayed. Moreover, competing demands caused by the workload associated with EPA's responses to lawsuits challenging some of its rules caused additional delays. For example, the time needed to respond to litigation of previous rules impinged on EPA staff's ability to develop new rules, according to agency officials. In addition, at the time of our 2000 report, EPA officials also attributed delays to the emergence of new scientific information that led to major Clean Air Act activities unforeseen by the 1990 amendments. For example, the emergence of new scientific information regarding the importance of regional ozone transport led to an extensive collaborative process between states in the eastern half of the country to evaluate and address the transport of ozone and its precursors.

As of April 2005, 45 of the requirements related to Titles I, III, and IV with statutory deadlines that had passed have not been met. Thus, any improvements in air quality that would result from EPA meeting these requirements remain unrealized. The majority of the unmet requirements related to Title I are activities involving promulgating regulations that limit the emissions of volatile organic compounds from different groups of consumer and commercial products. According to EPA officials, these rules were never completed because EPA shifted its priorities toward issuing the Title III technology-based standards. Additionally, EPA officials noted that many states have implemented their own rules limiting emissions of volatile organic compounds from these products, and these state rules are achieving the level of emissions reductions that would be achieved by a national rule passed by EPA. However, EPA is currently being sued because it did not implement these rules by their statutory deadlines. According to an EPA official, the agency and the litigant have agreed on the actions to be taken to address the requirements, but they could not reach agreement on completion dates. As a result, EPA is currently awaiting court-issued compliance dates. In addition, 21 Title III requirements have

yet to be met.[9] Most of these are "residual risk" reviews of technology-based standards with deadlines prior to April 2005. That is, within 8 years of setting each technology-based standard, EPA is required to assess the remaining health risks (the residual risk) from each source category to determine whether the standard appropriately protects public health. Applying this "risk-based" approach, EPA must revise the standards to make them more protective of health, if necessary. EPA completed its first review and issued the first set of these risk-based amendments in March 2005. Two actions required by Title IV have not been met, but, according to EPA, the agency has decided not to pursue these actions further. The requirements were to (1) promulgate an opt-in regulation for process sources and (2) conduct a sulfur dioxide/nitrogen oxides inter-pollutant trading study. According to EPA officials, the agency decided not to promulgate the opt-in regulation because it determined that the federal resources needed to develop the rule would be well in excess of those available and the implementation of this provision would not reduce overall emissions. EPA officials also said that the rule would not be cost-effective due to these factors and the limited number of sources expected to use the opt-in option. EPA officials said that the agency decided not to pursue the sulfur dioxide/nitrogen oxides inter-pollutant study because of the lack of a trading ratio that would capture the complex environmental relationship between sulfur dioxide and nitrogen oxides and because an inter-pollutant trading program would be complex and unlikely to result in environmental benefits.

The list of specific actions EPA is required to take to meet the objectives of Titles I and III of the Clean Air Act Amendments of 1990 includes requirements for periodic assessments of some of the standards related to these titles. Under the Clean Air Act, EPA is required every 5 years to review the levels at which it has set national ambient air quality standards to ensure that they are sufficiently protective of public health and welfare. If EPA determines it is necessary to revise the standard, the agency undertakes a rulemaking to do so. Each new national ambient air quality standard, in turn, will trigger a number of subsequent EPA actions under Title I, such as setting the boundaries of areas that do not attain the standards and approving state plans to correct nonattainment. As a result, the set of required actions related to Title I tends to repeat over time. Title

[9]This number does not include those residual risk reviews that were not yet due as of April 2005, nor does it include recurring reviews of MACT standards to account for improvements in air pollution controls and prevention, as discussed further in appendix II.

III also includes requirements for periodic assessments of its technology-based standards. In addition to the residual risk assessments discussed above, the Clean Air Act requires that EPA review the technology-based standards every 8 years, and, if necessary, revise them to account for improvements in air pollution controls and prevention. The first round of these recurring reviews will occur concurrently with the first round of residual risk assessments, according to an EPA official. Moreover, EPA's workload related to its air programs may increase as a result of recommendations for regulatory reform compiled by the Office of Management and Budget. For example, in response to a recommendation to permit the use of new technology to monitor leaks of volatile air pollutants, EPA plans to propose a rule or guidance in March 2006.

Observations

The Clean Air Act Amendments of 1990 constituted a significant overhaul of the Clean Air Act, and notable reductions in emissions of air pollutants have been attained as a result of the many actions these amendments required of EPA, states, and other parties. Currently, EPA has completed most of the 452 actions required by the 1990 amendments related to Titles I, III, and IV. The number, scope, and complexity of the required actions under each of these titles varied widely, and these differences, along with other challenges EPA faced, led to varying timeliness in implementing these requirements. Although EPA did not meet the statutory deadlines in many cases, we believe that the deadlines played an important role in EPA's implementation of the myriad and diverse actions mandated in the 1990 amendments by providing a structure to guide and support the agency's efforts to complete them.

As EPA and the Congress now move on to addressing the remaining air pollution problems that pose health threats to our citizens, some points from our 2000 report on the implementation of the 1990 amendments bear repeating. First, some of the stakeholders we interviewed representing environmental groups and state and local government agencies expressed a preference for legislation and regulations that describe specific amounts of emissions to be reduced, provide specific deadlines to be met, and identify the sources to be regulated. Second, we, along with many of these stakeholders, concluded in that report that the acid rain program under Title IV could offer a worthwhile model for some other air quality problems because it set emission-reduction goals and encouraged market-based approaches, such as cap-and-trade programs, to attain these goals. While EPA officials noted that emissions-trading programs may not be suitable for all air pollutants, the agency has applied this approach to several

pollutants since 2000. Specifically, EPA has issued final rules using cap-and-trade programs to achieve further reductions in sulfur dioxide and nitrogen oxides and to require reductions of mercury emissions for the first time. However, whether EPA can apply the cap-and-trade model to hazardous air pollutants such as mercury in the absence of express statutory authority to do so is unclear, particularly in light of the lawsuit that has been filed challenging EPA's March 2005 rule on mercury emissions.

Agency Comments and Our Evaluation

We provided EPA with a draft of this report for its review and comment. EPA generally agreed with the findings presented in the report and provided supplemental information about the air quality, public health, and environmental benefits associated with implementation of the Clean Air Act Amendments of 1990 and comments related to its future challenges. The agency also provided technical comments, which we incorporated where appropriate. Appendix V contains the full text of the agency's comments and our responses.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the date of this letter. At that time, we will send copies of this report to the appropriate congressional committees; the Administrator, EPA; and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions, please call me at (202) 512-3841. Key contributors to this report are listed in appendix VI.

John B. Stephenson
Director, Natural Resources
and Environment

Title I

The Clean Air Act requires that all areas of the country meet national ambient air quality standards (NAAQS), which are set by EPA at levels that are expected to be protective of human health and the environment. NAAQS have been established for six "criteria" pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur oxides, particulate matter, and lead. The act further specifies that EPA must assess the level at which the standards are set every five years and revise them, if necessary.

To accomplish the objectives of Title I of the Clean Air Act Amendments of 1990, EPA identified 171 requirements.[1] The specific requirements contained in Title I direct EPA to perform a variety of activities, many of which are related to implementing the NAAQS. Implementation of the standards involves several stages, many requiring efforts by both EPA and states. For example, once EPA has determined the appropriate air quality level at which to set a standard, the agency then goes through a designation process during which it identifies the areas of the country that fail to meet the standard. After the nonattainment areas are identified, states have primary responsibility for attaining and maintaining the NAAQS. To do this, states develop state implementation plans (SIPs) that specify the programs that states will develop to achieve and maintain compliance with the standards. Once a state submits a SIP to EPA, EPA is responsible for reviewing it and either approving or disapproving the plan. To assist states in developing their plans, EPA develops guidance documents that help states interpret the standards and provide information on how to comply. For example, EPA established several alternative control techniques documents for various sources that emit nitrogen oxides. These documents provide suggestions for states and industry on different techniques that can be used to reduce nitrogen oxides emissions. In some circumstances, EPA may provide guidance to the state and local air pollution control agencies through the issuance of EPA guidance and/or policy memos. For example, although designating areas as nonattainment or attainment is a complex and time-consuming process, EPA issued guidance through policy memos on the factors and criteria EPA used to make decisions for designating areas of the country as nonattainment.

[1]The number of requirements identified by EPA to meet the objectives of Title I has increased since GAO conducted its previous study in 2000. This increase is due to the recurring nature of Title I-related requirements (for example, EPA must review each NAAQS every 5 years).

As of April 2005, EPA had completed 146 of the requirements that the agency must implement to meet the objectives of Title I. Sixty-one requirements that EPA had met by April 2005 had statutory deadlines. As table 4 shows, EPA met 16 of these requirements on time and missed the deadlines for 45 of them. EPA also completed 85 of the 88 requirements that did not have statutory deadlines.

Table 4: Status of Requirements Related to Title I of the Clean Air Act Amendments of 1990 as of April 2005

Requirements with statutory deadlines	Number
Met on time	16
Met late	45
Unmet – deadlines prior to April 2005	22
Subtotal	**83**
Requirements without statutory deadlines	
Completed	85
Not completed	3
Subtotal	**88**
Total	**171**

Source: GAO analysis of EPA data.

On average, Title I-related requirements that were met late were completed 24 months after their statutory deadline. As table 5 shows, the length of time by which requirements were met late for Title I varied. For example, 24 of the late requirements were met within 1 year of their statutory deadline while 8 requirements were completed more than 3 years late.

Table 5: Length of Time by which Title I-Related Requirements with Statutory Deadlines Were Met Late

Length of time	Number of requirements
Up to 12 months	24
13 to 24 months	9
25 to 36 months	4
Over 36 months	8
Total	**45**

Source: GAO analysis of EPA data.

According to EPA, the agency missed deadlines for Title I-related requirements for a number of reasons, such as (1) having to review a larger quantity of scientific information than was available in the past; (2) competing demands placed on agency staff who had to work concurrently on more than one major rulemaking; and (3) engaging in longer, more involved interagency review processes. According to agency officials, many of the requirements that EPA completed late arose due to issues beyond EPA's control. For example, in implementing the ozone and particulate matter NAAQS, the emergence of new scientific information regarding the importance of regional ozone transport led to an extensive collaborative process between states in the eastern half of the country to evaluate and address the transport of ozone and its precursors. This information was then taken into account in the review and subsequent revision of the ozone NAAQS in 1997. In addition, EPA was sued on both the 1997 ozone and particulate matter standards, which delayed EPA's action to designate areas as nonattainment. Moreover, the ongoing review of the particulate matter NAAQS has been significantly extended as a consequence of the unprecedented amount of new scientific research that has become available since the last review, according to EPA.

Currently, EPA has not completed 22 requirements related to Title I with statutory deadlines (see table 6). Fifteen of these requirements call for rules involving different groups of consumer and commercial products, six involve reviewing the NAAQS for the criteria pollutants, and one requires EPA to finalize approving the state implementation plans for ozone and carbon monoxide. The outstanding rules involving the consumer and commercial products are to limit volatile organic compound emissions from various products, such as cleaning products, personal care products, and a variety of insecticides. The 1990 amendments specified that the rules

be promulgated in four groups, based on a priority ranking established by EPA that includes a number of factors, such as the quantity of emissions from certain products. While EPA completed the first group of rules by September 1998, the agency had not done anything further to implement the remaining three groups of rules. According to EPA officials, no further work had been done to implement the rules because EPA shifted its priorities toward issuing the Title III technology-based standards. Additionally, EPA officials noted that many states have implemented their own rules limiting emissions of volatile organic compounds from these products, and these state rules are achieving the level of emissions reductions that would be achieved by a national rule passed by EPA. An EPA official stated that a national rule would not provide much of an additional benefit in the areas where emissions of volatile organic compounds are a problem and that a national rule would be fought by industry in states where emissions of volatile organic compounds are not a problem. However, promulgating these rules is a requirement under the 1990 amendments, and according to EPA officials, the agency is currently being sued by the Sierra Club, an environmental advocacy group, for not promulgating them by their statutory deadline. EPA and the litigant have agreed on the actions to be taken to address the requirements, however, they could not reach agreement on the completion dates and are currently awaiting court-issued compliance dates.

In addition, the other six unmet requirements related to Title I involve potentially revising the NAAQS for the criteria pollutants. While EPA has been involved in litigation regarding four of these standards, litigation is still ongoing only regarding the lead NAAQS. EPA is being sued for not reviewing since 1991 the lead NAAQS that was originally issued in October 1978. According to EPA officials, the agency did not undertake this review because it shifted its focus to controlling other sources of lead, such as drinking water and hazardous waste facilities. As shown in table 6, EPA expects to complete the required reviews for four of the criteria pollutants by 2009.

Table 6: Title I-Related Requirements with Statutory Deadlines Not Met by EPA as of April 2005

Description of requirements	Type of requirement	Statutory deadline	Projected completion date
Consumer and Commercial Products—Group 2—Flex package printing	Regulation	March 1999	Unknown
Consumer and Commercial Products—Group 3—Aerosol spray paints	Regulation	March 2001	Unknown
Consumer and Commercial Products—Group 3—Industrial cleaning solvents	Regulation	March 2001	Unknown
Consumer and Commercial Products—Group 3—Flat wood paneling	Regulation	March 2001	Unknown
Consumer and Commercial Products—Group 3—Lithographic printing	Regulation	March 2001	Unknown
Consumer and Commercial Products—Group 4—Paper, film, and foil coatings	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Letterpress printing	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Plastic parts	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Metal furniture	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Auto and light duty trucks assembly	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Petroleum dry-cleaning	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Misc metal parts	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Large appliances	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Fiberglass boat manufacturing	Regulation	March 2003	Unknown
Consumer and Commercial Products—Group 4—Misc industrial adhesives	Regulation	March 2003	Unknown
Promulgate decision on ozone NAAQS	Regulation	July 2002	December 2007
Promulgate decision on particulate matter NAAQS	Regulation	July 2002	September 2006
Promulgate decision on sulfur oxides NAAQS	Regulation	May 1991	Unknown
Promulgate decision on carbon monoxide NAAQS	Regulation	August 1999	May 2009
Promulgate decision on nitrogen dioxide NAAQS	Regulation	October 1991	Unknown
Promulgate decision on lead NAAQS	Regulation	1996[a]	June 2009
Approve or disapprove state implementation plans for ozone and carbon monoxide	Regulation	November 1994[b]	September 2005

Source: GAO analysis of EPA data.

Note: Consumer and commercial product requirements have been issued either as regulations or as guidelines in the past.

[a]EPA provided only the year of this statutory deadline.

[b]There was more than one statutory deadline for this requirement. This table presents the latest deadline.

In addition to the unmet requirements discussed above, EPA has three requirements related to Title I without statutory deadlines that have not yet been completed. The first is to develop a proposed particulate matter implementation rule, which EPA expects to complete in summer 2005. The second is the promulgation of methods for measurement of visible emissions; EPA has not yet set a completion date for this action. The third is the promulgation of phase II of the 8-hour ozone implementation rule, expected in summer 2005.

Title III

Title III of the Clean Air Act Amendments of 1990 established a new regulatory program to reduce the emissions of hazardous air pollutants, specifying 189 air toxics whose emissions would be controlled under its provisions. The list includes organic and inorganic chemicals, compounds of various elements, and numerous other toxic substances that are frequently emitted into the air. Title III was intended to reduce the population's exposures to these pollutants, which can cause serious adverse health effects such as cancer and reproductive dysfunction. After identifying the pollutants to be regulated, Title III directs EPA to impose technology-based standards, or Maximum Achievable Control Technology (MACT) standards, on industry to reduce emissions. These technology-based standards require the maximum degree of reduction in emissions that EPA determines achievable for new and existing sources, taking into consideration the cost of achieving such reduction, health and environmental impacts, and energy requirements. The process for developing each MACT standard may include surveying impacted industries, visiting sites, testing emissions, and conducting public hearings. As a second step, within 8 years after completing each technology-based standard, EPA is to review the remaining risks to the public and, if necessary, issue health-based amendments to each of the MACT rules to address such risks. The first set of these "residual risk" standards was finalized in March 2005; residual risk standards for the remaining MACT rules have not been completed. Finally, the Clean Air Act requires that EPA review and, if necessary, revise the technology-based standards at least every 8 years, to account for improvements in air pollution controls and prevention. The first round of these recurring reviews will occur concurrently with the first round of residual risk assessments, according to an EPA official.

EPA identified 237 requirements—either with statutory deadlines prior to April 2005 or without statutory deadlines—that accomplish the objectives of Title III of the Clean Air Act Amendments of 1990.[1] Most of the specific requirements under Title III direct EPA to promulgate MACT standards for various sources of hazardous air pollutants, such as dry cleaning facilities, petroleum refineries, and the printing and publishing industry. Title III also requires EPA to issue a variety of studies and reports to the Congress. For example, EPA has issued a series of studies on the deposition of air

[1]The number of requirements identified by EPA to meet the objectives of Title III has increased since GAO conducted its previous study in 2000. This change in the number of requirements is due to the inclusion of residual risk reviews, among other factors.

pollutants to the Great Lakes and other bodies of water. In addition, Title III also directs EPA to issue guidance on a number of subjects, including, for example, guidance regarding state air toxics programs.

As of April 2005, EPA had met almost all of the requirements it identified to fully implement the objectives of Title III of the Clean Air Act Amendments of 1990, as shown in table 7. EPA's most recent data show that it has taken the required action to meet 216 of the 237 Title III requirements, although 195 of these were met late, as shown in table 7.

Table 7: Status of Requirements under Title III of the Clean Air Act Amendments of 1990 as of April 2005

Requirements with statutory deadlines	Number
Met on time	13
Met late	195
Unmet	21
Subtotal	**229**
Requirements without statutory deadlines	
Completed	8
Not completed	0
Total	**237**

Source: GAO analysis of EPA data.

Notes: This table does not include data on residual risk reviews with deadlines after April 2005. It also does not separately count recurring reviews of MACT standards to account for improvements in air pollution controls and prevention; the first round of these reviews will occur concurrently with EPA's residual risk reviews.

As shown above, the vast majority of Title III requirements were met late. On average, Title III requirements met late were completed 25 months after their statutory deadline. However, the length of time by which requirements were met late varied. As shown in table 8, 116 of the 195 requirements met late were completed within the first 2 years after the statutory deadline, while 29 were not completed until more than 3 years after the deadline.

Table 8: Length of Time by which Title III Requirements with Statutory Deadlines Were Met Late

Length of time	Number of requirements
Up to 12 months	41
13 to 24 months	75
25 to 36 months	50
Over 36 months	29
Total	**195**

Source: GAO analysis of EPA data.

In explaining why requirements under Title III were met late, an EPA official discussed several factors. For example, the official said that the vast majority of the requirements involved the development of the MACT standards, which requires a significant amount of time and effort. The official also confirmed the reasons that requirements were met late provided by EPA officials at the time of our 2000 report, which included the need to prioritize, given resource limitations, the time needed to develop the policy framework and infrastructure of the MACT program, and the need for stakeholder participation in the rulemaking processes for certain MACT standards. In addition, the EPA official pointed out that in the past, litigation on issued rules has imposed additional demands on EPA staff working to meet outstanding requirements, leading to delays.

There are 21 requirements under Title III that EPA had not met as of April 2005, most of which involve the residual risk reviews required after EPA has set technology-based standards (see table 9). Specifically, EPA has not yet reviewed residual risk for 19 MACT standards with deadlines prior to April 2005. EPA completed its first review and issued the first set of these risk-based amendments, for the coke oven batteries MACT standard, on March 31, 2005.[2] In addition to the residual risk reviews, EPA has not yet completed its urban area source standards.[3] The other unmet requirement under Title III calls for EPA to promulgate standards for solid waste

[2]Coke ovens convert coal to coke which is used to produce iron at steel mills and foundries. A coke oven battery consists of a group of ovens connected by common walls.

[3]While EPA has completed area source standards for 15 of 70 categories of sources that emit over 30 different hazardous air pollutants, 50 of the remaining source categories are under litigation, and the remaining 5 categories have court-ordered deadlines for implementation.

incinerators not previously regulated under the title. According to an EPA official, the agency has focused its resources on regulating major solid waste incinerators, while this requirement consists of a "catch-all" to pick up remaining sources. Part of the challenge to completing this action has involved identifying what these other sources might be, according to the official.

Table 9: Title III Requirements Not Met by EPA as of April 2005

Description of requirements	Type of requirement	Statutory deadline	Projected completion date
Promulgation of urban area source standards	Regulation	November 2000	Unknown
Promulgation of standards for "other" solid waste incinerators	Regulation	November 2000	November 2005
Residual risk review for perchlorethylene emissions from dry cleaning facilities	Regulation	September 2001	April 2006
Residual risk review for organic hazardous air pollutants from the synthetic organic chemical manufacturing industry and other processes subject to the negotiated regulation for equipment leaks	Regulation	April 2002	December 2006
Residual risk review for industrial process cooling towers	Regulation	September 2002	March 2006
Residual risk review for ethylene oxide commercial sterilization and fumigation operations	Regulation	December 2002	March 2006
Residual risk review for gasoline distribution (stage 1)	Regulation	December 2002	March 2006
Residual risk review for halogenated solvent cleaning	Regulation	December 2002	December 2006
Residual risk review for magnetic tape manufacturing operations	Regulation	December 2002	March 2006
Residual risk review for chromium emissions from hard and decorative chromium electroplating and chromium anodizing tanks	Regulation	January 2003	Unknown
Residual risk review for epoxy resins production and non-nylon polyamides production	Regulation	March 2003	Unknown
Residual risk review for secondary lead smelting	Regulation	June 2003	Unknown
Residual risk review for petroleum refineries	Regulation	August 2003	Unknown
Residual risk review for aerospace manufacturing and rework facilities	Regulation	September 2003	Unknown
Residual risk review for marine tank vessel loading operations	Regulation	September 2003	Unknown
Residual risk review for shipbuilding and ship repair (surface coating) operations	Regulation	December 2003	Unknown
Residual risk review for wood furniture manufacturing operations	Regulation	December 2003	Unknown

(Continued From Previous Page)

Description of requirements	Type of requirement	Statutory deadline	Projected completion date
Residual risk review for printing and publishing industry	Regulation	May 2004	Unknown
Residual risk review for off-site waste and recovery operations	Regulation	July 2004	Unknown
Residual risk review for group I polymers and resins	Regulation	September 2004	Unknown
Residual risk review for group IV polymers and resins	Regulation	September 2004	Unknown

Source: GAO analysis of EPA data.

Note: The Clean Air Act requires EPA to review MACT standards at least every 8 years and revise them, if necessary, to account for improvements in air pollution controls and prevention; the first round of these reviews will occur concurrently with EPA's residual risk reviews.

In addition to the unmet requirements above, EPA has not yet completed residual risk reviews for 76 MACT standards whose deadlines fall later than April 2005. Because these residual risk reviews are not due until 8 years after the completion of each technology standard, some of these residual risk reviews are not due until 2012.

Title IV

Title IV of the Clean Air Act Amendments of 1990 established the acid deposition control program. This program was designed to provide environmental and public health benefits through reductions in emissions of sulfur dioxide and nitrogen oxides, the primary causes of acid rain. The program provides an alternative to traditional "command and control" regulatory approaches by using a market-based trading program that allocates sulfur dioxide emission allowances to affected electric utilities. The program creates a cost-effective way for utilities to achieve their required sulfur dioxide emission reductions in the manner that is most suitable to them. Utilities can choose to buy, sell, or bank their allowances, as long as their annual emissions do not exceed the amount of allowances (whether originally allocated to them or purchased) that they hold at the end of the year.[1] The nitrogen oxides program, on the other hand, does not cap emissions of nitrogen oxides, nor does it utilize an allowance trading system. Rather, this program, which focuses on emissions of nitrogen oxides from coal-fired electric utility boilers, provides flexibility for utilities in meeting emission limits by focusing on the emission rate to be achieved and providing options for compliance.

To accomplish the objectives of Title IV of the Clean Air Act Amendments of 1990, EPA identified 44 requirements. Many of the required activities had to do with setting up the acid rain program—for example, conducting allowance auctions, issuing allowances to utilities, and establishing an allowance trading system. Additionally, EPA developed requirements for utilities to continuously monitor their emission levels to properly account for allowances.

As of April 2005, EPA had completed 42 of the 44 requirements to meet the objectives of Title IV. There were 26 requirements in Title IV with statutory deadlines—EPA met 8 of them on time and missed 16; 2 others were unmet. There were 18 requirements that did not have statutory deadlines, and EPA has completed all of them. (See table 10.)

[1]The total amount of allowances allocated for all sources comprise the national cap for sulfur dioxide, and sources whose emissions exceed the amount of allowances held forfeit allowances to cover the excess emissions and must pay automatic financial penalties.

Table 10: Status of Requirements under Title IV of the Clean Air Act Amendments of 1990 as of April 2005

Requirements with statutory deadlines	Number
Met on time	8
Met late	16
Unmet	2
Subtotal	**26**
Requirements without statutory deadlines	
Completed	18
Not completed	0
Total number of requirements	**44**

Source: GAO analysis of EPA data.

Note: Based on additional information obtained for this report, we determined that, compared with our 2000 report, one additional requirement was met late.

On average, for the 16 requirements EPA met late, they were completed within approximately 15 months of their deadlines. As shown in table 11, 10 were met within 1 year of their deadline and 1 was met more than 3 years late.

Table 11: Length of Time by which Title IV Requirements with Statutory Deadlines Were Met Late

Length of time	Number of requirements
Up to 12 months	10
13 to 24 months	3
25 to 36 months	2
Over 36 months	1
Total	**16**

Source: GAO analysis of EPA data.

According to EPA officials, the agency was late with some of the requirements because interagency review and consultation with the Acid Rain Advisory Committee added time to the process. Officials consider this time spent worthwhile because it allowed for more stakeholder input into the rulemaking process, which may have made the rules less controversial. In fact, EPA officials stated that Title IV has been subjected to less litigation

than other titles. According to the officials, litigation, however, did cause a delay in the effective date of the first phase of the acid rain nitrogen oxides reduction program by 1 year. EPA officials said the second phase of this program affected approximately three times more units and was implemented on schedule.

EPA officials stated that since implementation of the acid rain program, changes have been necessary to keep the program up to date and successful. For example, EPA revised the continuous emission-monitoring rule in 1999 and 2002. According to EPA, these updates were necessary because of changes in the industry, such as technological advances and growth in the number of sources.

Two Title IV requirements that EPA has not completed have statutory deadlines that have passed. The two requirements are (1) promulgating the opt-in regulation for process sources and (2) conducting a sulfur dioxide/nitrogen oxides inter-pollutant trading study. After conducting preliminary work for the first action, which was to have been completed by May 1992, EPA determined that the federal resources required to accomplish it were well in excess of those available. Additionally, according to an EPA official, there was evidence of very limited use of the opt-in election for other sources. Given these two factors, and EPA's view that implementation of this provision would not reduce overall emissions, the agency determined that it would not be cost-effective to promulgate the regulation. Finally, EPA officials said that the agency decided not to pursue the second action, which was to have been completed by January 1994, for three reasons. Specifically, according to EPA officials, (1) they lacked a trading ratio that would capture the complex environmental relationship between sulfur dioxide and nitrogen oxides; (2) if the ratio issue could be resolved, an annual allowance system for nitrogen oxides would need to be created with which to trade sulfur dioxide allowances; and (3) it was not clear that implementing inter-pollutant trading would result in a net environmental benefit as there are multiple and complex health and environmental impacts of both sulfur dioxide and nitrogen oxides requiring a comprehensive analysis of impacts and cost-effectiveness beyond available resources.

Objective, Scope, and Methodology

The objective of this review was to determine the extent to which the Environmental Protection Agency (EPA) has completed the various actions required to meet the objectives of Titles I, III, and IV of the Clean Air Act Amendments of 1990. These titles, which respectively address national ambient air quality standards, hazardous air pollutants, and acid deposition control, are the most relevant to proposed legislation and recently finalized regulations that address emissions of air pollutants by power plants.

To obtain information on the status of EPA's implementation of requirements related to Titles I, III, and IV of the Clean Air Act Amendments of 1990—both those with and without statutory deadlines—we obtained lists of these requirements used for GAO's 2000 report, *Air Pollution: Status of Implementation and Issues of the Clean Air Act Amendments of 1990* (GAO/RCED-00-72) and held discussions with EPA officials knowledgeable about EPA's workload required to meet the objectives of these titles. EPA officials verified the list of requirements related to each of the three titles for accuracy and completeness and provided documentation for any changes and additions made to the list.[1] To determine how late the requirements were met, we compared the statutory deadline for each requirement to the month in which the requirement was met. For regulations that appeared in the *Federal Register*, for example, we considered the date the *Federal Register* issue was published to be the date the requirement was met, as agreed with EPA officials.[2] In addition, we obtained explanations for why a large number of requirements were met after their statutory deadlines from two sources—our 2000 report and through discussions with EPA officials. For requirements that had not been met as of April 2005, we obtained additional information from EPA officials, including actions taken to date.

[1]This report does not include some actions under titles I and III that EPA officials identified after our work was completed, the agency had reviewed and provided comments on a statement of facts, and EPA had provided official agency comments on the draft report (see app. V). The actions EPA identified, which they categorized as incomplete, involve periodic reviews of new source performance standards and combustion new source performance standards required by the Clean Air Act Amendments of 1990.

[2]While agency officials agreed to use the publication date in the *Federal Register* as the date the various required actions were completed, EPA said in its comments on the draft report that the Office of Air and Radiation generally views the date a rule is signed and shared with the public as the date the agency has met its statutory obligations. The agency acknowledged that using the signature date would not change the report's conclusions.

To ensure the reliability of the information provided by EPA, we requested documentation for any changes EPA made to the list of requirements developed for our previous report and checked the documentation to ensure it matched the description of the requirement. In addition, we reviewed the information EPA submitted to ensure there were no duplicate entries or apparent inconsistencies; for any entries that appeared questionable, we followed up with EPA officials and usually obtained additional documentation. In certain cases, in particular with regard to Title III requirements, we also independently verified the status of the requirements. In all cases, EPA provided confirmation for the conclusions we reached as well as, in some cases, additional documentation. We determined that the data we obtained about the status of EPA's implementation of required actions were sufficiently reliable for the purposes of this report. We also reviewed the methodology of two EPA studies that contained information about areas of the United States impacted by ground-level ozone and particulate matter.[3] We determined that these studies were sufficiently methodologically sound to present their results in this report as background information.

While this report addresses the extent to which EPA has met its requirements related to Titles I, III, and IV of the 1990 amendments, it does not address the status of requirements under other titles of the amendments or show the extent to which states have implemented applicable requirements. We conducted our work from January 2005 to May 2005 in accordance with generally accepted government auditing standards.

[3]EPA, *The Ozone Report: Measuring Progress through 2003* (EPA 454/K-04-001, April 2004); and EPA, *The Particle Pollution Report: Current Understanding of Air Quality and Emissions through 2003* (EPA 454-R-04-002, December 2004).

Comments from the Environmental Protection Agency

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 18 2005

Mr. John B. Stephenson
Director
Natural Resources and Environment
U.S. Government Accountability Office
Washington, D.C. 20548

OFFICE OF
AIR AND RADIATION

Dear Mr. Stephenson:

Thank you for the opportunity to review your draft report entitled "EPA Has Completed Most of the Actions Required by the 1990 Amendments, but Many Were Completed Late" (Draft Report). We appreciate the work that the Government Accountability Office (GAO) has done to evaluate the Environmental Protection Agency's (EPA's) track record in meeting the deadlines established in three important sections of the Clean Air Act Amendments of 1990 (1990 CAAA). Although this information meets the specific request to which you were responding, it presents only a piece of the picture of EPA's implementation of the 1990 CAAA. We believe it is important to look not only at how many regulations were issued when, but also at the public health and environmental benefits achieved by these regulations.

We appreciate the opportunity to provide a short review of the air quality, public health, and environmental benefits associated with implementation of the 1990 CAAA. As you state in your Draft Report, the Clean Air Act (CAA) has been extraordinarily successful in reducing air pollution. This country should be very proud of the tremendous improvements that it has made in air quality because of this law and efforts by EPA, States, Tribes, local governments, industry, environmental groups, and other stakeholders.

Progress Under the 1990 CAAA

Building on Success: The 1990 CAAA built on the Clean Air Act, which had already accomplished significant reductions in air pollution and provided significant public health and environmental benefits. For example, in a 1997 Report to Congress, EPA found that without the air pollution control programs established from 1970 to 1990, 205,000 Americans would have died prematurely in 1990 and millions more would have suffered illnesses ranging from mild respiratory symptoms to heart disease, chronic bronchitis, asthma attacks, and other severe respiratory problems. Other benefits and costs are set forth in the report, which found the mean estimate of total benefits over the period was more than 42 times the total costs.[1]

[1] United States Environmental Protection Agency, Office of Air and Radiation, "*The Benefits and Costs of the Clean Air Act: 1970 to 1990*" (October 1997). Note that these benefits estimates do not include a number of potentially important benefits which could not be readily quantified, such as ecosystem changes and air toxics-related human health effects. The point estimate of direct costs does not reflect several potentially important uncertainties, such as the degree of accuracy of private sector cost survey results that could not be quantified.

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Benefits of the 1990 CAAA: In 1990, Congress set an incredibly ambitious regulatory agenda for the Agency when it passed the 1990 CAAA. The agenda was ambitious in terms of the number of regulations to be issued, the public health and environmental benefits to be achieved, the cost of compliance, and the number of industries that would be affected. Although the methodologies for estimating costs and benefits are continuing to evolve, one measure of the extent of the regulatory accomplishments of the 1990 CAAA is provided in the Thompson Report, issued by the Office of Management and Budget (OMB), which found that the 1990 CAAA achieved very large benefits compared to all other federal regulations adopted in the same time period. OMB estimated that major federal rules issued by the federal government from fiscal years 1994 through 2003 had total monetized benefits ranging from $63 to $169 billion and cost between $35 and $40 billion. Of these rules, major rules issued by EPA's Office of Air and Radiation (OAR) accounted for total monetized benefits from $35 to $116 billion and costs of $16 to $22 billion.[2] This report did not include the benefits of the Acid Rain Trading Program because those rules were adopted prior to the ten-year period under review. In OMB's previous Thompson Report, which looked at fiscal years 1993 through 2002, OMB included the Acid Rain Trading Program rules, and estimated their benefits as $78 to $79 billion and its costs as $1.1 to $1.9 billion.[3]

In a separate study,[4] EPA projected the annual public health benefits in 2010 from actions implementing the 1990 CAAA and projected the avoided incidences of adverse health problems, as shown in Table 1. These measures of success of the 1990 CAAA are not broken apart by specific title, but there are specific measures that are useful for evaluating the individual titles covered by your Draft Report.

[2] Office of Management and Budget, Office of Information and Regulatory Reform, "*Progress on Regulatory Reform: 2004 Report to Congress on the Costs and Benefits of Federal Regulations and Unfunded Mandates on State, Local and Tribal Entities*" (2004, Tables 2 and 3 at pp. 7 and 10). Although this was a key period for implementation of the 1990 CAAA, this 10-year snapshot does not capture all of the costs and benefits of implementation of the 1990 CAAA.

[3] *Id.* at Table 13, p. 139.

[4] U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Policy, "*The Benefits and Costs of the Clean Air Act: 1990 to 2010*" (November, 1999). The analysis was designed to estimate the costs and benefits of the 1990 Amendments incremental to those assessed in the 1997 retrospective analysis cited in fn. 1. It does not include benefits from certain rules adopted later, such as the Tier 2 and heavy duty on-road and off-road motor vehicle and low sulfur fuel rules.

TABLE 1:
Benefits of the 1990 Clean Air Act: 2010 Incidence Reductions.

Endpoint	*5th%*	*Mean*	*95th%*
Mortality (30+)	14,000	23,000	32,000
Chronic Bronchitis	5,000	20,000	34,000
Chronic Asthma	1,800	7,200	12,000
Cardiopulmonary Hospitalization	23,000	64,000	134,000
Asthma ERVs	430	4,800	14,000
Minor Illnesses	Millions	Millions	Millions
Restricted Activity Days	10,000,000	12,000,000	13,000,000
Work Loss Days	3,600,000	4,100,000	4,600,000

Progress Under Title I of the 1990 CAAA: Title I of the 1990 CAAA modified the existing program for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) due to concerns that many parts of the country still had not met health-based standards for six key pollutants. Thus, one measure of our success in implementing Title I is that 70% of areas not meeting a NAAQS in 1990 meet those standards today, as shown in Table 2.[5]

TABLE 2:
Reductions in Number of Nonattainment Areas

Criteria Pollutant	Nonattainment areas as of 1992	Areas currently monitoring nonattainment (based on 2003 data)
NO2	**1**	0
SO2	**54**	16
CO	**43**	0
Lead	**13**	2
PM10	**87**	21
Ozone (1-hour)	**101**	27

[5] Please note that, although Title I of the CAA as amended by Title I of the 1990 CAAA sets up the framework and key regulatory programs to bring areas into attainment with the NAAQS, attainment is also a result of other programs, such as fuel and mobile source regulations promulgated under Title II of the CAA as amended by Title II of the 1990 CAAA.

***Progress Under Title III of the 1990 CAAA*:** Under Title III of the 1990 CAAA, EPA has issued regulations that, when fully implemented, will produce annual reductions in stationary source hazardous air pollutants (HAPs) almost 15 times greater than the reductions EPA was able to achieve between 1970 and 1990. In Title III, Congress adopted a new approach to regulating HAPs out of concern that, under the 1970 CAA as amended in 1977, EPA was moving too slowly in regulating HAPs. Prior to 1990, EPA had listed and regulated only 7 HAPs. Congress decided that a completely different approach was required. In Title III, Congress (rather than EPA) listed the 189 chemicals that would be regulated and then, in a key provision of Title III establishing the Maximum Achievable Control Technology (MACT) standards, set up a series of deadlines by which EPA had to issue regulations limiting HAP emissions from all stationary source categories (over a certain size). This required EPA to issue 96 regulations covering 174 source categories over a 10-year period – an incredibly ambitious task. As noted in your Draft Report, EPA has now issued all of the required MACT standards. Air toxics emissions from major stationary sources will decline by 1.7 million tons annually (approximately 60%) from 1993 levels once the MACT standards are fully implemented in 2007.

***Progress Under Title IV of the 1990 CAAA*:** By any measure, the Acid Rain Trading Program in Title IV of the 1990 CAAA has been an unqualified success. SO2 emission reductions from the Acid Rain Trading Program began early (well before the formal first phase compliance deadline of January 1, 1995). The results of the program have been dramatic and unprecedented. Compliance has been nearly 100 percent. Reductions in power plant SO_2 emissions were larger and earlier than required, providing earlier human health and environmental benefits. SO2 emissions from power generation have decreased 32 percent from 1990 levels, which is associated with a 30% reduction in ambient levels of sulfate in the Eastern United States since 1990.[6] Compliance costs are 75 percent lower than initial EPA estimates. As a result of new limits issued under Title IV, NOx emissions from power generation are 2 million tons below annual levels projected to occur in the absence of Title IV. Title IV's reductions in sulfates and nitrates have reduced ambient levels of PM2.5, which has reduced premature mortality and pulmonary and cardiovascular illnesses caused by PM2.5, and have increased visibility in national parks.

Future Challenges

Although we have made significant progress in improving air quality in the United States, we still have air quality challenges to meet. As a result of new science that showed the then-existing NAAQS did not adequately protect public health, in 1997 EPA adopted a revised, more stringent national ambient air quality standard for ozone (called the 8-hour ozone standard) and, for the first time ever, set a NAAQS for fine particles (PM2.5).

Although it is still early in the statutorily-established timeline for bringing areas into attainment with these standards, EPA has already issued several rules that, in combination with existing regulations, will bring many of these areas into attainment. These rules include the NOx SIP Call, which limited eastern power plants' summer-time NOx emissions; the Tier 2 standards for cars, light-duty trucks and low-sulfur fuel; the standards for heavy-duty on-road and off-road vehicles and low-sulfur diesel fuel; and the Clean Air Interstate Rule, which is designed to limit

[6] The Acid Rain Program 2003 Progress Report (Sept. 2004, pp. 2-3).

SO2 and NOx emissions from power plants. For the eastern part of the country, EPA projects that by 2015, these rules in combination with other existing state and federal rules, will bring into attainment 98 of the current 104 eight-hour ozone nonattainment areas and 22 of the current 36 PM2.5 nonattainment areas. By addressing large, regional components of the ozone and PM2.5 pollution early in the implementation process, EPA has made it easier for state and local governments to understand the scope of the air pollution problem they will need to address and to focus their resources accordingly.

See comment 1.

Although the scope of the PM2.5 and 8-hour ozone nonattainment problems is a good measure of our future air quality challenges, it should not be used to measure EPA's implementation of Title I of the 1990 CAAA, as is implied in the Draft Report. The new standards were not adopted until seven years after the 1990 CAAA and were then litigated for several years. The Draft Report should be corrected so that it does not convey the misleading impression that the missed 1990 CAAA deadlines are somehow responsible for, or associated with, the scope of the current PM2.5 and 8-hour ozone nonattainment problems.

Timing of Issuance of Regulations

GAO correctly notes that EPA has completed most of the rules and other activities required by the 1990 CAAA through the present. GAO also correctly observes that many requirements were completed after the statutory deadline.

See comment 2.

Effect of Delays in Meeting 1990 CAAA Deadlines: Without providing any support, the Draft Report notes that, for requirements for which we missed deadlines, associated improvements in air quality were delayed. While this may seem to be nothing more than a statement of the obvious, it is nevertheless untrue. A delay in issuing a rule does not necessarily lead to a delay in the compliance date for the rule, and thus does not necessarily lead to a delay in air quality improvements associated with the rule. For example, although several regulations related to the Acid Rain Trading Program were late, the program started on time. The air quality improvements were not delayed – and in fact they started earlier than was required by the statute. Also, not all rules required by the 1990 CAAA had air quality benefits. For example, our judgment is that the Title IV requirement to adopt a rule to allow process sources to opt in to the Acid Rain Trading Program would not have had associated air quality improvements. Furthermore, some rules were delayed because EPA worked with stakeholders to develop a consensus for the rule – which made it less likely that implementation of the rule (and associated air quality improvements) would be delayed by legal challenges.

Although the Draft Report notes that there may have been delays in air quality improvements as a result of missed deadlines, it fails to acknowledge the flip side – that there were air quality improvements as a result of EPA regulations that were issued under CAA authority but without a statutory deadline. For example, the Clean Air Interstate Rule that EPA issued in March, 2005, will provide significant air quality improvements. EPA had authority to issue it, but not a statutory deadline to do so.

Reasons for Delays in Meeting 1990 CAAA: In assessing EPA's record in meeting the deadlines in the 1990 CAAA, EPA believes it is important to consider the public health and

environmental results mentioned above. We also believe it is useful to examine in slightly more detail than in the Draft Report the reasons the deadlines were missed. Some of the more significant reasons are outlined below.

Collaborative Rulemaking Processes: The 1990 CAAA set tight deadlines for an unprecedented number of new actions by EPA, including development of major new programs (e.g., air toxics, acid rain, operating permits) and emission standards that involved controversial, precedent-setting and complex issues important from environmental and economic standpoints. At the outset, EPA recognized that extensive involvement of state and local leaders, industry and environmental groups would be necessary if the 1990 CAAA were to be implemented successfully. This collaborative approach added to the time needed to complete many rulemakings. In a number of cases, EPA conducted formal or informal regulatory negotiations with all the stakeholders prior to proposing regulations. These historic negotiations were successful in reaching agreement on several very complex programs, including several hazardous air pollutant standards and the core regulations for the acid rain trading program. The time spent in up-front discussions, although often lengthy, paid off by getting stakeholder agreement early in the rulemaking process.

Interrelated Rulemakings: The array of deadlines in the 1990 CAAA required EPA to move forward simultaneously with states and stakeholders on multiple major rulemakings, placing multiple demands upon EPA managers and key non-EPA participants. Some programs (e.g., hazardous air pollutants) involved multiple, interrelated rulemakings that were moving ahead simultaneously, and changes in one ongoing rulemaking could affect another, causing delays.

Non-1990 CAAA Obligations: Major competing demands were placed on EPA, states and other stakeholders by CAA issues not arising from the 1990 amendments, including scientific and other issues. One example was the development, including an extensive scientific review, of the new air quality standards for ozone and particulate matter, which the CAA requires EPA to review every five years. In addition EPA undertook an extensive stakeholder consultation process on implementation issues. Another was the emergence of new scientific information documenting the importance of regional ozone transport. This led EPA to extend deadlines for state submittal of ozone plans for many areas, and engaged states and EPA in a two-year process to conduct modeling studies and to study potential solutions. That process led to EPA's NOx SIP Call rule, another major effort. This was followed by extensive additional work on transport related to ozone and fine particle pollution, which culminated in the Clean Air Interstate Rule. The workload associated with response to litigation on some rules also caused competing demands.

Prioritization and Finite Resources: Some implementation activities are more important than others because they have greater impact – even though they may not have a statutory deadline (e.g., the Clean Air Interstate Rule or the NOx SIP Call). The ambitious agenda in the CAA, given the reality of finite resources, inevitably required EPA to stage the timing of implementation activities to ensure that the most important activities were given priority, which resulted in missed deadlines for other activities. As part of the yearly appropriations process, EPA made its Congressional authorizers and appropriators aware that resource limitations and

prioritization decisions would result in missed statutory deadlines, particularly for the hazardous air pollutant MACT standards.

Minor Comments on Report Methodology

See comment 3.

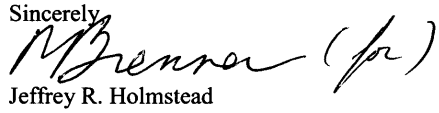
OAR generally uses a different definition than does GAO of the date on which OAR meets its statutory obligations to issue final rules. Generally, OAR considers that it has met its statutory obligation to issue a rule on the date on which it promulgates a final rule, which occurs when a final rule is signed and publicly disseminated. OAR's practice has been to disseminate final rules publicly (either by placing them on the web or distributing hard copy to interested stakeholders) on the date on which the rule is signed or shortly thereafter. At that time, the rule is final and affected stakeholders understand the obligations created by the rule. Publication of the final rule in the *Federal Register* occurs later, often by a month or more. In its analysis, GAO looks to the date of publication in the *Federal Register*. Looking to date of promulgation rather than date of *Federal Register* publication would undoubtedly shorten the average amount of time by which EPA missed deadlines (perhaps by a month or so) and might also decrease somewhat the number of regulations that were issued late. However, EPA does not believe that it would change the basic conclusions of GAO's Draft Report.

See comment 4.

We also noted some inconsistencies in the description of the scope of Title I requirements covered by the Draft Report and suggest that the language be clarified. For example, Appendix IV says that the Draft Report does not address the status of requirements established before the 1990 CAAA, but Table 6 in Appendix I lists six actions that are required under the pre-existing Clean Air Act and are not required under the 1990 Amendments (i.e., promulgate decisions on six different NAAQS).

Thank you again for the opportunity to comment on this Draft Report and provide additional information about the air quality, public health and environmental improvements from implementation of the 1990 CAAA.

Sincerely,



Jeffrey R. Holmstead
Assistant Administrator for Air and Radiation

The following are GAO's comments on EPA's letter dated May 18, 2005.

GAO Comments

1. As background, our report states that while air quality in the United States has steadily improved over the last few decades, more than a hundred million Americans continue to live in communities where pollution causes the air to be unhealthy at times, according to EPA. EPA has apparently interpreted this statement as implying that missed deadlines described in the report are responsible for the scope of the current particulate matter and ozone nonattainment problems. However, our report does not make that link.

2. EPA provided us several examples of cases in which a delay in the implementation of certain specific requirements did not lead to a delay in improvements in air quality. While our draft report indicated that requirements met late delayed improvements in air quality, we did not mean to suggest that all late requirements delayed improvements in air quality. Therefore, we revised the report to say that delays in implementation of some of the requirements may have led to delays in improvements in air quality.

3. During the course of our work, we discussed our proposed methodology with EPA officials and they agreed with our plan to use the *Federal Register* publication date as the completion date for relevant requirements. In commenting on the draft report, however, the agency stated that its Office of Air and Radiation generally considers that it has met its statutory obligation to issue a rule on the date on which a final rule is signed and disseminated to the public, which is likely to be earlier than the publication of that rule in the *Federal Register*. Although we agree with EPA's assessment that using the signature date, rather than the *Federal Register* publication date, would not change the report's conclusions, we revised the report to include EPA's comment.

4. We revised report language throughout to reflect the fact that certain actions originally included as requirements of Title I of the Clean Air Act Amendments of 1990 were established earlier but are related to these amendments.

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