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Acid Rain: A Decade of Footdragging May Be Coming to an End

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I. INTRODUCTION

In last year’s National Coal Issue Senator Robert Byrd remarked that, while environmental concerns have been raised over the in-
creased use of coal, this mineral "is one of the fundamental building blocks of the American economy" and should be considered "the cornerstone of our nation's energy policy." One manifestation of this dominant role of coal in our nation is its overwhelming influence upon air quality in the eastern United States. For example, the nine largest coal burning states emit nearly two-thirds of the sulfur dioxide (SO$_2$) in the eastern states.

While few scientists and public officials today doubt the seriousness of the so-called "acid rain" problem, the economic and political ramifications of regulating acid rain and their resultant effects on coal producers and users have led to more than a decade of inaction by the Federal Environmental Protection Agency (EPA) and the states. The Clean Air Act (the Act) allows, but does not mandate, the development of acid rain control programs, but thus far it has been totally ineffective in addressing the acid rain issue. However, in 1989, with the advent of a new administration and a new Congress and with the apparent growing willingness to find a solution to the problem of such one-time skeptics as the United Mine Workers and the state of Ohio, it appears likely that Congress will finally enact effective acid rain legislation.

II. "ACID RAIN" DEFINED

Although the term "acid rain" tends to stress effects associated with rain, it is generally understood to encompass two forms of atmospheric pollutants which either contain acids or contribute to their formation. The first is wet deposition which brings acids to the earth's surface in the form of rain and fog. The second, dry deposition, consists of minute sulfate (SO$_4$) or nitrate (NO$_3$) particles which may settle to the earth or remain airborne for lengthy periods of time.

3. Part IV of this article describes six sections of the Act which could have been used by EPA to address acid rain. See infra notes 33 through 121 and accompanying text.
Acid rain is caused primarily by emissions of sulfur dioxide (SO$_2$) and nitrogen oxides (NO$_x$). Most SO$_2$ comes from fossil fuel power plants and metal smelters, while NO$_x$ comes from these same sources and automobiles. As the atmosphere carries SO$_2$ and NO$_x$ away from these sources, they can be transformed through a series of complex chemical processes into sulfate and nitrate aerosols which can further react with water to form sulfuric and nitric acids. The SO$_2$ and NO$_x$ can also form ozone (O$_3$), the prime component of urban smog.

Acidity is measured on the pH (potential hydrogen) scale, which runs from 0 to 14. Seven is "neutral" on the scale, with numbers above that level representing alkaline substances and numbers below that level representing increasingly acidic substances. Normal rain water is slightly acidic, with a pH of approximately 5.6. Since the pH scale is logarithmic, water with a pH of 4.6 is ten times more acidic than normal rain water, and water with a pH of 3.6 is one hundred times more acidic than normal rain water.

A recent congressional report from the Office of Technology Assessment revealed that the three-state area of Ohio, West Virginia and Pennsylvania shares the highest levels of both precipitation acidity and ozone, the annual average acidity of the area's rain water being at or below 4.2 on the pH scale. Although not officially measured, the lowest recorded pH for any single rain storm anywhere in the world also occurred within this same region. At Wheeling, West Virginia in the fall of 1978, levels below 2.0 were recorded during a three-day drizzle. That rain was 5,000 times more acidic than normal and surpassed even lemon juice (pH of 2.1) in acidity.

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9. Id.
12. Id.
III. ADVERSE IMPACTS

Although the research and debate continue over the severity of the effects of acid rain, its effects on lakes and streams have drawn the most intensive study to date. Substantial evidence now indicate that acid deposition alters water chemistry in sensitive lakes and streams. Fish are sensitive both to the acidity of the water and to toxic metals, particularly aluminum, which may be released from a watershed under acid conditions. When waters become more acidic than pH 5 many fish species are eliminated and major changes in lake ecosystems occur. According to a recent study of the National Academy of Sciences, man-made \( \text{SO}_2 \) emissions are the primary cause of acid precipitation and have led to increased acidity and environmental damage in some northeastern lakes. Available data also indicate that since 1970 the streams in the southeastern United States have experienced the highest rate of increase of acid precipitation effects. For example, acidification threatens 150 miles of West Virginia’s total 550 miles of native brook trout streams.

While acid deposition cannot be singled out as the principal cause of forest decline, ozone and acid depositions are believed to be major contributors to productivity declines and premature tree deaths in areas with elevated pollution levels in North America and Europe. One area with elevated pollution levels is the eastern United States. One-quarter to one-third of the forested land in the eastern United States is exposed to ozone concentrations of approximately twice the normal, unpolluted level. Neither pests nor disease, common causes of forest declines, appears to be responsible for forest damage in New York, Vermont, New Jersey, Virginia and Tennessee.

14. OTA REPORT, supra note 10, at 41.
15. Id. at 42.
16. NAS Study Confirms Past Reports Linking Environmental Damage With Sulfur Dioxide, 16 ENV’T REP. (BNA) 2085 (1986) [hereinafter NAS Study Confirms Reports].
17. NAS REPORT, supra note 13, at 7.
18. R. BOYLE, supra note 8, at 15.
19. OTA REPORT, supra note 10, at 44-45.
20. Id.
21. Id.
precipitation and other stressful airborne pollutants are suspected to have caused widespread dieback on red spruces in the Appalachian Mountains from West Virginia to New England, in the Adirondack Mountains of New York, in the White Mountains of New Hampshire, in the Laurentian Mountains of Quebec, and throughout the Green Mountains of northern Vermont. Responding to massive die-backs of red spruce and fraser firs at higher elevations in North Carolina and other eastern mountains, Dr. Robert Bruck of North Carolina State University calls for continued forest research but believes it would be “foolhardy, at best, and dangerous to the future of our terrestrial ecosystems, at worst” to use further research as an excuse to delay the debate on creating sound mitigation strategies aimed at acid deposition and photochemical oxidants.

While the lake and forest effects of acid deposition have dominated the debate in past years, other far-ranging effects are now better understood. For example, sulfur oxides damage iron, steel, zinc, paint and stone, putting urban areas and areas with significant buildings and monuments at the greatest risk. One study estimates that even a twenty-five to thirty percent reduction of \( \text{SO}_2 \) emissions below current standards in selected urban areas could yield materials-related benefits of hundreds of millions of dollars annually.

Visibility impairments, particularly those associated with sulfates, now exist over vast portions of the United States. This impairment is especially troublesome in the eastern part of our nation. In a 1985 report to Congress, EPA acknowledged that airborne sulfate particles may account for forty to eighty percent of regional haze in much of the East, and that the most important source of haze producing pollution in the east is \( \text{SO}_2 \) emissions from utility and industrial coal and oil combustion.

22. R. Mello, supra note 7, passim.
25. Id.
Sulfate-related haze in vast areas of the eastern United States is now inhibiting our ability to see and enjoy our natural vistas. The National Park Service has complained of man-made haze at virtually all of the national parks: "[V]isibility monitoring has shown that in excess of 90% of the time scenic vistas are affected by man-made pollution at all National Park Service (NPS) monitoring locations within the lower 48 United States." 27 At the Shenandoah National Park in Virginia, for example,

[fifty percent of the time in the spring and summer we are unable to see the Allegheny front range, which is less than 35 miles away. In order for visitors standing on the elevated Skyline Drive to get a geographical context of how the park fits into the rest of the geography, they cannot see it [sic]. Fifty percent of the time they can barely see the Massanutten Range, which is the first mountain range and which is only 10 miles away. . . . A person 10 percent of the time cannot see Massanutten at all. You cannot see the bends of the Shenandoah River down below. It is very difficult to make out the panoply of the forests, the fields, the towns, and the roads which this elevated viewing platform, the Skyline Drive, offers. 28

Perhaps the most dire consequences of acid rain pollutants and ozone are the health effects. At current levels ozone and the sulfur and nitrogen components of acid rain are harmful to human health, especially to the health of infants, children and the elderly. 29 Airborne sulfate and other fine particulates, because they are extremely small and are inhaled deeply into the lungs, are suspected of being responsible for approximately 50,000 premature deaths per year or about two percent of total annual mortality. 30 If current emissions remain the same through the year 2000, these numbers could even increase slightly. 31 Because of these severe health effects, in early 1987, doctors from the American Academy of Pediatrics, the Amer-

30. OTA REPORT, supra note 10, at 47.
31. Id.
ican Lung Association, the American Public Health Association and the Mount Sinai Medical Center in New York City joined to urge Congress to curb acid rain.32

IV. INACTION BY EPA UNDER THE CURRENT CLEAN AIR ACT

Although the problems of acid deposition were known to Congress when it amended the Clean Air Act in 1977 and are now better understood by the general populace, the Act, at least under past EPA leadership, has proved nearly valueless in addressing acid rain.33

Part of the problem with the Act is its overall structure. Under the Act EPA first sets the broad National Ambient Air Quality Standards (NAAQS) for certain pollutants; then the individual states design their own State Implementation Plans (SIP’s) to meet the NAAQS within their borders.34 However, acid rain is a problem involving the long range transport of pollutants from many sources in many different states.35 The structure of the Act which focuses primarily on regulating individual sources and their effects within state boundaries is, thus, ineffective.36

However, even with its current limitations, there are several portions of the existing Act which EPA has avoided using to implement an effective acid rain control program. The following will summarize six areas in which EPA has actually fought efforts, both in the rulemaking arena and in the courts, to use the Act as an effective remedial tool in dealing with the acid rain problem.

32. Id; New York Times, Feb. 4, 1987, at 12A, col. 4. During testimony before the Environmental Pollution Subcommittee of the Senate Environment and Public Works Committee on February 3, 1987, Dr. Philip J. Landrigan, Director of the Division of Environmental and Occupational Medicine at the Mount Sinai School of Medicine stated that “acid rain is probably third after active smoking and passive smoking as a cause of lung disease.” Id. See also Audette, Acid Rain Killing More than Lakes and Trees, ENVTL. ACTION 11-13 (May, June 1987).

33. See Garland, Dealing With Acid Rain: The Clean Air Act is Not Enough, 23 TRIAL 58 (Oct. 1987).


36. McCartney, supra note 34.
A. National Ambient Air Quality Standards

The NAAQS have been described as the "heart" or the "cornerstone" of the Clean Air Act.\(^{37}\) It stands to reason that if EPA is unwilling to establish NAAQS to control the chemical components of acid rain, then there will never be a cornerstone for an effective acid rain program under the current Act. EPA's refusal to modify the NAAQS for sulfur oxides exemplifies the problem.

In 1970 Congress added sections 108 and 109 to the Act.\(^{38}\) These sections required EPA to establish national primary and secondary ambient air quality standards\(^{39}\) for each pollutant for which air quality "criteria" had been issued under prior law.\(^{40}\) Air quality "criteria" were supposed to "reflect the latest scientific knowledge" on "all identifiable effects on public health and welfare" for a given pollutant.\(^{41}\) The NAAQS were then to be based on the criteria which had been developed.\(^{42}\) Based on criteria which had already been developed in 1969, a time when there was little understanding of acid rain in the United States, EPA promulgated and revised primary and secondary NAAQS for \(\text{SO}_2\) in 1971 and 1973.\(^{43}\)

In 1977 Congress amended section 109 of the Act to require the EPA Administrator to complete a thorough review of the air quality criteria and simultaneously make appropriate revisions to the NAAQS by December 31, 1980 and at five year intervals thereafter.\(^{44}\) EPA did not meet the 1980 deadline, but EPA did eventually issue revised

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\(^{39}\) 42 U.S.C. §§ 7408, 7409 (1983). "Primary" standards are designed to protect the public health with an adequate margin of safety, and "secondary" standards are designed to protect the public welfare from any known or anticipated adverse effects. 42 U.S.C. § 7409(b) (1983).


\(^{43}\) On April 30, 1971 EPA promulgated two primary standards (an annual mean, and a 24hour maximum) and three secondary standards (annual mean, 24-hour, and three-hour) for \(\text{SO}_2\). 36 Fed. Reg. 8,186 (1971). In 1973 EPA withdrew the secondary annual and 24-hour standards, and left in place the three-hour standard. 38 Fed. Reg. 25,678 (1973). The existing NAAQS for \(\text{SO}_2\) are codified at 40 C.F.R. §§ 50.4-50.6 (1988).

criteria in 1982.\textsuperscript{45} The 1982 criteria described in detail that sulfur oxides acidified precipitation and surface water bodies, that this acidification was harmful to fish and other aquatic organisms, and that acid deposition may have caused harm to forests and soils.\textsuperscript{46} The criteria also acknowledged that acid deposition caused billions of dollars of damage to stone, metal, paint and other building and consumer products and that sulfur oxides were a primary cause of summertime haze.\textsuperscript{47} In 1984 EPA revised these criteria and confirmed the existence of these deleterious effects of sulfur oxide emissions.\textsuperscript{48}

Yet, despite its own acknowledgments of the harmful effects of sulfur oxides and despite the mandate of section 109(b)(2) to set standards to protect the public from "any known or anticipated adverse effects," EPA made no move in 1982 or 1984 either to review and revise the existing NAAQS for $\text{SO}_2$ or to propose a standard for $\text{SO}_4$, the prime culprit in acid deposition.\textsuperscript{49} In late 1985 seven states and three environmental groups filed a citizens' suit against EPA under section 304 of the Act\textsuperscript{50} to compel EPA to review and revise the sulfur oxide NAAQS so as to comport with the 1982 and 1984 criteria.\textsuperscript{51} EPA opposed the claim that it was required to revise the $\text{SO}_2$ NAAQS and obtained a dismissal of the action on jurisdictional grounds in the spring of 1988.\textsuperscript{52}

A few days after this dismissal, EPA did finally issue a proposed rule regarding revisions of the sulfur oxides NAAQS, but EPA declined to make any changes in the fifteen-year-old standards.\textsuperscript{53} Although acknowledging "major welfare effects" associated with acid

\begin{footnotesize}
45. EPA, \textit{Air Quality Criteria for Particulate Matter and Sulfur Oxides}, EPA-600/8-82-029a,b,c (Dec. 1982) [hereinafter 1982 \textit{Criteria}].

46. Id.

47. Id.


49. NAS Study Confirms Reports, supra note 16.

50. 42 U.S.C. § 7604 (1983). Under this provision "any person" may sue to compel the EPA Administrator to perform an act or duty which is not discretionary under the Act.


52. Id.

\end{footnotesize}
deposition and sulfur oxide emissions, EPA described any NAAQS changes to curb acid rain as "premature and unwise." 54

EPA's refusal to act on acid rain in this instance until "scientific uncertainties have been reduced," 55 is but one of several lost opportunities to address acid rain under the current Act. 56

B. State Plan Approvals Under Section 110

Even without changes to the NAAQS program, EPA could also have used its review powers under section 110 of the Act to lessen the effects of acid rain or, at least, to avoid aggravating the problem. 57 EPA chose not to do so, and the courts upheld EPA's discretion to ignore acid rain effects under section 110. 58

Under section 110(a)(2) 59 EPA must evaluate state implementation plans and their revisions in accordance with several enumerated criteria. EPA may not approve a plan that prevents another state from attaining or maintaining any NAAQS or that interferes with another state's Prevention of Significant Deterioration (PSD) Program. 60

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54. Id. at 14,935-14,936. Since the writing of this article, the United States Court of Appeals for the Second Circuit has reversed the trial court's dismissal of the citizens' suit challenging EPA's inaction on sulfur oxide NAAQS revisions. Supra note 51. In remanding the case with the directive that EPA be required to make a formal decision on NAAQS revisions, a majority of the Second Circuit panel was critical of EPA's evasion of its statutory duties: [W]e cannot agree with appellees that the Administrator may simply make no formal decision to revise or not to revise, leaving the matter in a bureaucratic limbo subject neither to review in the District of Columbia Circuit nor to challenge in the district court. No discernible congressional purpose is served by creating such a bureaucratic twilight zone, in which many of the Act's purposes might become subject to evasion. The 1982 criteria and the 1984-1985 "Critical Assessment" triggered a duty on the part of EPA to address and decide whether and what kind of revision is necessary. Environmental Defense Fund v. Thomas, No. 88-6142, slip op. 2181, 2199 (2d Cir. Mar. 22, 1989) (2-1 decision).


56. For example, EPA has not promulgated changes to the NO₅ standard to help alleviate the problem.


58. See infra note 63 and accompanying text.


60. New York v. U.S.E.P.A., 716 F.2d 440, 441-42 (7th Cir. 1983). The PSD program was added to the Act in 1977 to assure that decisions to increase air pollution did not unduly diminish air quality in designated clean air areas. 42 U.S.C. § 7470 (1983).
During the early 1980's when the knowledge of acid rain was growing, EPA reviewed and approved scores of amendments to state plans which allowed sources to release over a million additional tons of $\text{SO}_2$ into the atmosphere annually.\textsuperscript{61} Even when challenged in two federal courts by the state of New York on the wisdom and lawfulness of these amendments, EPA declined to consider air quality effects more than fifty kilometers from the sources under review because it had not yet accepted some of the long-range air quality modeling techniques being used elsewhere. EPA also refused to consider the cumulative impacts of multiple sources to determine if emissions were interfering with other states' NAAQS or PSD programs.\textsuperscript{62} The United States Courts of Appeal for the Sixth and the Seventh Circuits both deferred to EPA and stated that EPA enjoys considerable discretion to determine the scope of review of the state implementation plans under section 110(a)(2).\textsuperscript{63}

Ironically, it is precisely this same breadth of discretion which also would have enabled EPA to have used section 110 as a mechanism to avoid increased $\text{SO}_2$ emissions, pending continued scientific study of acid rain effects. Again, because there was nothing in the Clean Air Act compelling EPA to take action, it chose to ignore the dangers that increased $\text{SO}_2$ emissions might pose to downwind states.

C. Interstate Petitions Under Section 126

While declining to impose any additional obligations on EPA in the section 110 cases, in 1983 both the Sixth and Seventh Circuits agreed with EPA's assertion that interstate impacts, including cumulative effects from multiple sources, could and should be considered in pending proceedings under section 126.\textsuperscript{64}

Under section 126(b), a state may petition EPA for a finding that emissions from facilities in another state are causing air pol-

\textsuperscript{61} G. \textsc{Wetstone}, \textit{supra} note 4, at 112 n.90.
\textsuperscript{63} \textit{Id.}
olution within its borders in violation of the prohibitions of section 110(a)(2)(E)(i). This subsection requires each state implementation plan to contain measures

(i) prohibiting any stationary source within the State from emitting any air pollutant in amounts which will (I) prevent attainment or maintenance by any other state of any such national primary or secondary ambient air quality standard, or (II) interfere with measures required to be included in the applicable implementation plan for any other state under part C of this subchapter to prevent significant deterioration of air quality or to protect visibility, and (ii) insuring compliance with the requirements of section [126] of this title, relating to interstate pollution abatement. 66

In 1980 and 1981 New York, Pennsylvania, and Maine filed separate petitions with EPA under section 126, alleging that the cumulative impacts of SO\textsubscript{2} emissions in seven midwestern states substantially contributed to violations of NAAQS and impaired visibility within the petitioning states' borders. 67 Petitioners noted that the seven midwestern states emitted forty-seven percent of the total SO\textsubscript{2} produced in the eastern half of the United States. 68

Although EPA would later admit that section 126 was an appropriate mechanism for analyzing interstate sulfur oxide impacts 69 and although section 126(b) explicitly required a decision on the petition within 60 days, EPA refused to rule on the petition for over three years. Finally, in December of 1984 upon being ordered to act by a federal court EPA denied all three petitions. 70 Setting the groundwork for future inaction on sulfur oxide NAAQS revisions and visibility protection regulations, EPA denied the petitions, in part, because there were no NAAQS pertaining to acid deposition

68. Petitioners made this point both in the administrative proceedings before EPA and in a subsequent petition for review before the U.S. Court of Appeals for the District of Columbia Circuit. Joint Brief for Petitioners at 2, New York v. U.S.E.P.A., 852 F.2d at 577.
69. Both the Sixth and the Seventh Circuits described EPA's admission that § 126 was the appropriate procedure for analyzing cumulative impacts of interstate sulfur oxide pollution. New York, 716 F.2d 440; New York v. Administrator, U.S.E.P.A., 710 F.2d 1200.
and because EPA’s own 1980 regulations on visibility were limited to plume blight, not the sulfate-related problem of regional haze.\footnote{72. Id., at 48,153. Discussed elsewhere in this article are EPA’s refusal in 1988 to set a NAAQS aimed at acid deposition and its resistance to promulgating regulations addressing regional haze. By refusing to act in these two areas, EPA created a "Catch-22" by telling the § 126 Petitioners that their petitions must fail for lack of adequate NAAQS and visibility regulations.}

Despite the command of section 110(a)(2) that the EPA administrator shall approve a state plan only “if he determines” that the interstate damages of subpart (E) will not occur,\footnote{73. 42 U.S.C. § 7410(a)(2).} EPA ruled that it was the petitioners’ burden, not EPA’s, to show that the prohibitions of section 110(a)(2)(E) had been violated.\footnote{74. See, e.g., 49 Fed. Reg. 48,154 (1984); 47 Fed. Reg. 6,624 (1982); 46 Fed. Reg. 38,937 (1981).}

Again, even though EPA was, in effect, assuming no harmful interstate effects unless proven otherwise, the federal courts deferred to EPA’s discretion to draw scientific conclusions and to place the burden of proof upon the petitioning states.\footnote{75. Although the court remanded New York’s petition in view of changes in the NAAQS for suspended particulates (TSP), the court upheld EPA’s interpretations of §§ 110(a)(2)(E) and 126(b). State of New York v. U.S.E.P.A., 852 F.2d at 581.

D. Tall Stack Regulations Under Section 123

Although the previously discussed sections of the Act make no explicit references to problems of pollution travelling long distances, Congress added section 123 to the Act in 1977 specifically to alleviate the long range transport of pollutants from a growing number of very tall factory and utility smokestacks.\footnote{\footnote{76. 42 U.S.C. § 7423 (1983). See, e.g., H.R. Rep. No. 294, 95th Cong., 1st Sess. 83-86 (1977), reprinted in 1977 U.S. CODE CONG. & ADMIN. NEWS 1077; 123 CONG. REC. 18,026 (1977) (remarks of Sen. Muskie).}} As with other portions of the Act, EPA again resisted applications of that new section which could have eliminated the migration of sulfates and other acid rain pollutants over hundreds of miles and into other states.

After the 1970 overhaul of the Clean Air Act, EPA had been required to promulgate NAAQS for various pollutants, and each state had then been required to adopt state implementation plans (SIP’s) to provide for attainment and enforcement of these stan-
Because taller smokestacks tend to disperse pollutants over a greater area, many pollution sources proposed to use taller stacks and other dispersion techniques in place of direct limitations on emissions as a means of meeting the new NAAQS. EPA made it a policy in the mid-1970's to approve these dispersion techniques, but reviewing courts soundly rejected them as inconsistent with the Act.

In 1977 Congress also rejected the practice of using tall stacks to meet air quality standards. By adding section 123 to the Act, Congress declared that such tall stacks and other dispersion techniques were not to be taken into account in calculating the limits on source emissions imposed by the Act. The amendment also required EPA to promulgate stack height regulations within six months of August 7, 1977.

Despite this mandate for swift action, it was not until February of 1982, after EPA had been placed on a court-ordered timetable, that EPA issued final stack height regulations. These regulations attempted to apply a new concept known as “good engineering practices” (GEP). In assessing the expected pollution effects from a particular smokestack, regulators would now only calculate the pol-


78. The industry practice of using dispersion techniques to meet NAAQS after 1970 is described in Natural Resources Defense Council, Inc. v. Thomas, 838 F.2d 1224, 1230 (D.C. Cir.) cert. denied, 109 S. Ct. 219 (1988). In addition to the construction of tall stacks, other dispersion techniques included the combining of exhaust gases from several stacks into one stack and the use of “intermittent control systems,” which varied the times and rates of discharges to take advantage of changes in wind and other weather conditions. Id. at 1230, 1251.


80. Sierra Club, 719 F.2d at 439.


83. Congress had defined “good engineering practices” as “the [stack] height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies and wakes which may be created by the source itself, nearby structures or nearby terrain obstacles (as determined by the Administrator).” 42 U.S.C. § 7423(c) (1983).
olution-reducing characteristics of a theoretical stack at GEP height. Stacks taller than GEP would not be credited for any actual dispersion characteristics above this theoretical limit.\textsuperscript{84}

As a result of a petition for review by the Sierra Club and the Natural Resources Defense Council (NRDC), the Court of Appeals for the District of Columbia Circuit found numerous shortcomings in the new stack height regulations.\textsuperscript{85} For example, citing the fact that tall stacks and other dispersion techniques "had been linked to the formation of acid rain," the court faulted EPA's attempt to relax emission limitations by allowing credits for taller stacks which would avoid "plume impaction on hills and mountains in the area of the source."\textsuperscript{86} The court reversed EPA on its "plume impaction" rule and on one other portion of its regulations and remanded for further action on six other portions of the regulations.\textsuperscript{87}

Although the court ordered EPA to correct the regulations within six months,\textsuperscript{88} EPA sought postponement of this deadline and did not issue final regulations until June 27, 1985, over seven years after the original statutory deadline.\textsuperscript{89} Again, the regulations were challenged by NRDC and others as being unduly lax, and in early 1988 the Court of Appeals for the District of Columbia Circuit remanded certain portions of the revised regulations for further action. The court found that too many existing smokestacks had been "grandfathered," or exempted, from the new regulations and that EPA's definitions of dispersion techniques subject to the regulations were too narrow.\textsuperscript{90}

\textsuperscript{85} Sierra Club, 719 F.2d at 436.
\textsuperscript{86} Although nothing in § 123 authorized it, EPA had sought to allow credit for taller stacks in those instances where the plume of exhaust gases might impact a hill or mountain downwind of the stack. Instead of requiring sources in these hilly areas to reduce stack emissions, EPA proposed to allow them greater leeway in constructing taller stacks. Sierra Club, 719 F.2d at 454-57.
\textsuperscript{87} Id., at 470.
\textsuperscript{88} Id.
\textsuperscript{89} 50 Fed. Reg. 27,892 (1985).
\textsuperscript{90} Natural Resources Defense Council, Inc. v. Thomas, 838 F.2d 1224 (D.C. Cir.), cert. denied, 109 S. Ct. 219 (1988). For example, EPA had sought in its 1983 regulations to exempt certain pollution sources which accomplished increased dispersion of pollutants by combining several gas streams into a single stack, as long as those sources had been "originally designed and constructed" after 1970 with combined gas streams. 40 C.F.R. § 51.1(fhb)(2)(ii) (1985). The court failed to find any reasoned
In short, EPA’s reaction to the 1977 congressional mandate to end unnecessary stack height credits was abysmally slow and timid. Despite the congressional mandate for swift action, almost twelve years of delays and false starts have ensued, and EPA has yet to promulgate regulations fully complying with section 123. As with other portions of the Act, EPA again resisted applications of the new section 123 which could have eliminated the migration of sulfates and other acid rain pollutants over hundreds of miles and into other states.

E. Visibility Impairments Under Section 169A

As has already been indicated in part III,91 another obvious manifestation of the high sulfate concentrations in the air is the widespread haze that blankets the eastern United States, particularly in the summer months. Unlike the early 1950’s when the summer season was known as the clearest time of year in the eastern half of the nation, summer has now become the haziest season.92 While natural background visibility in the Appalachian range is between thirty and fifty miles, actual summertime visibility now tends to be only one-third to one-fifth that distance.93

In the 1977 Clean Air Act amendments, Congress sought to remedy this growing problem when it added section 169A.94 Section 169A mandates that good visibility be restored to so-called “Class I” federal areas. Class I areas consist of the larger national parks and certain federal wilderness areas where visibility is important.95 Congress declared a “national goal” of “prevention of any future, basis for this exemption because power plant engineers since the early 1960’s had designed plants with merged gas streams in order to increase exhaust plume rise and obtain increased dispersion. Id. at 1253-54.

91. See supra note 26 and accompanying text.

92. EPA, PROTECTING VISIBILITY, AN EPA REPORT TO CONGRESS, EPA-450/5-79-008 at 6-6, 6-9 (1979).

93. EPA, supra note 26, at 3.


and remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution." Within twenty-four months of August 7, 1977, EPA was required to promulgate visibility regulations to "assure reasonable progress" toward meeting the national goal.

Consistent with its slow response to the other 1977 amendments, EPA did not meet the twenty-four month deadline. Rather, only after it was sued to force compliance did EPA issue visibility regulations in December, 1980. However, instead of issuing comprehensive regulations, EPA chose to divide its regulatory program into two phases. In Phase I EPA proposed to address only the more limited and more easily understood problem of "plume blight," which is defined as "an identifiable, coherent plume which is observable against a background sky or other object. In many cases, the plume may be visually traced back to a single source."

Even though section 169A(a)(1) called for the eradication of "any" impairments, EPA chose to delay action on the more prevalent problem of "regional haze" until it would issue Phase II regulations at some unspecified date in the future. EPA defined regional haze to be "a widespread reduction in visibility resulting from a polluted air mass, and [one which] frequently occurs on a scale of hundreds of miles and lingers for long periods of time." EPA also noted that "[t]he haze may move over long distances and cause visibility impairment in areas which have few or no man-made emission sources."

Despite its promise to issue Phase II "regional haze" regulations and despite the fact that, by 1985, regional haze was known to be the most serious form of visibility impairment in our national parks and wilderness areas, EPA has not yet issued any visibility re-

102. Id.
103. Id.
regulations aimed at regional haze. To the contrary, it has actively opposed state efforts to regulate regional haze because it believes that a regional haze control program would be too "costly and widespread." 105

From the perspective of several northeastern states, the thrust of EPA's efforts in the 1980's has been to oppose all efforts and initiatives to control regional haze. For example, when Maine petitioned EPA in 1981 for a finding under section 126(b) that sulfate pollution from other states was interfering with visibility at Acadia National Park, EPA denied the petition because EPA visibility regulations did not address regional haze. 106

EPA gave Vermont the same rebuff in 1987 when that state proposed to EPA a mandated state plan aimed at visibility impairments at the Lye Brook Wilderness Area. 107 EPA advised Vermont that the state would remain without a remedy for its acknowledged regional haze problem "until such time as EPA decides to promulgate a national regional haze program." 108 Ironically, while EPA hid behind its lack of regulations in responding to both Maine and Vermont, it took no step toward issuing Phase II regulations on regional haze.

To further compound its intransigence, EPA also actively opposed efforts by Maine, Vermont, the Sierra Club Legal Defense Fund and several other states and environmental groups to obtain a court order requiring the issuance of Phase II regulations. 109

EPA's inaction has not gone without notice. Although declining to overturn EPA's denial of Vermont's visibility plan, the Second Circuit described EPA's inaction on regional haze as "lamentable" and expressed hope that EPA would act:

105. 51 Fed. Reg. 43,392 col. 2 (1986). In this proposed rulemaking, EPA proposed to take "no action" on a State of Vermont proposed implementation plan to control regional haze impairments at the Lye Brook Wilderness Area in Vermont.
108. Id.
Finally, we note that, more than ten years after the enactment of Section 169A, there is still no national program addressing regional haze. We are sympathetic to petitioners' argument that something must be done soon. EPA's assurances of future action on regional haze are of little comfort to Vermont and visitors to Lye Brook. We can only hope that EPA will act quickly in furtherance of the national visibility goal.\textsuperscript{110}

Beyond this clear statement from the Second Circuit, it is this writer's opinion that EPA's lackadaisical attitude toward this major air pollution problem is a national scandal that will not cease until Congress takes forceful action.

\textbf{F. Transboundary Pollution Under Section 115}

Of all the sections of the Clean Air Act, section 115 is best suited to the task of tailoring a program to alleviate acid rain.\textsuperscript{111} Entitled "International Air Pollution," section 115 requires the EPA Administrator to direct source states to make corrective state plan revisions whenever the Administrator has made two findings: (1) that, based upon receipt of reports, surveys or studies from any duly constituted international agency, he has reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country (the "endangerment finding"), and (2) that the foreign country in question gives the United States essentially the same rights with respect to the prevention or control of air pollution occurring in that country, as is given that country by section 115 (the "reciprocity finding").\textsuperscript{112}

Unlike the rest of the Act, which depends in large measure on the existence of a NAAQS for the pollutant in question, section 115 permits the implementation of a remedial program for "any air pollutant or pollutants" adversely affecting a foreign nation.\textsuperscript{113} In the case of acid rain, where there are currently no NAAQS for sulfates, nitrates, or their related acids, section 115 offers the flexibility to create an effective acid deposition control program.

\textsuperscript{110} Vermont v. Thomas, 850 F.2d 99, 104 (2d Cir. 1988).
\textsuperscript{112} 42 U.S.C. §§ 7415(a), 7415(c) (1983).
\textsuperscript{113} 42 U.S.C. § 7415(a) (1983).
In the waning days of the Carter Administration, EPA invoked section 115 for this very purpose. On January 13, 1981 EPA Administrator Douglas M. Costle wrote detailed letters to both Secretary of State Edmund Muskie and Senator George Mitchell (D-Maine). In the letters Costle referenced the provisions of section 115 and made both the endangerment and the reciprocity findings.\textsuperscript{14} Costle also instructed his staff to examine the transboundary acid deposition problem and to make recommendations as to which states should receive formal directives to modify their state plans in accordance with section 115.\textsuperscript{15}

When Administrator Costle’s successor at EPA failed to follow up on the section 115 findings, several states and environmental groups filed a citizens’ suit in the Federal District Court for the District of Columbia seeking to compel EPA to give formal notification to the states in which harmful emissions originate and to set in motion the necessary state plan revisions to eliminate transboundary acid deposition.\textsuperscript{16} The court ruled in favor of the plaintiffs and ordered EPA to issue the notifications under section 115.\textsuperscript{17} On appeal, however, the D.C. Circuit reversed the lower court’s decision because the Costle findings had not been formally published as “rules” in the Federal Register.\textsuperscript{18}

Seeking to cure this defect, nine states and five environmental groups jointly filed a formal petition for rulemaking under section 115 in April, 1988.\textsuperscript{19} The petition asked EPA to publish promptly the endangerment and reciprocity findings made by former Administrator Costle in 1981 and since confirmed in subsequent EPA state-
ments and publications. Six months later on October 14, 1988, after the petitioners had obtained a meeting with EPA to set a schedule for responding to the petition, Acting Assistant Administrator for Air and Radiation Don R. Clay responded by letter as follows: "I do not believe that EPA presently has sufficient information to undertake the regulatory program required by Section 115, including the endangerment finding requested in your petition. Therefore . . . I believe it would be premature to rule on your petition at this time." 121

As had been the case with other avenues of redress under the Act, EPA was once again making it very clear that it would avoid at all costs taking any actions which might alleviate acid rain. To this end, EPA was even willing to contradict a former EPA Administrator's 1981 findings.

V. THE GROWING NEED FOR STRONG ACID RAIN LEGISLATION

If one lesson can be drawn from EPA's headlong rush into inactivity in the last eight years, it is that the financial and political stakes of an effective acid rain control program have been too high to allow for discretionary action by an apparently timid agency. 122 If Congress is to be successful in its original intent to "speed up, expand, and intensify the war against air pollution in the United States," 123 then it is going to have to take upon itself the duty of setting forth a forceful and detailed acid rain program which grants EPA as little discretion as possible.

120. The petitioners identified EPA documents, reports, and testimony in which EPA had confirmed acid rain damage to Canada caused by U.S. emissions. They also confirmed that EPA Administrator Thomas had also repeated the reciprocity finding in pleadings to the federal district court in State of New York, 613 F. Supp. 1472 (1985).

121. Letter from Don R. Clay to David Wooley, October 14, 1988. As a result of this decision not to rule on the petition, the Province of Ontario, the Sierra Club, the Izaak Walton League of America, the National Audubon Society and nine states filed petitions for review in the Court of Appeals for the District of Columbia Circuit in November of 1988. Her Majesty the Queen in Right of Ontario v. U.S.E.P.A., No. 88-1778 (D.C. Cir. filed Nov. 1, 1988); Sierra Club and Izaak Walton League of America v. Thomas, No. 88-1780 (D.C. Cir. filed Nov. 1, 1988); State of New York v. Administrator Lee Thomas, No. 88-1812 (D.C. Cir. filed Nov. 22, 1988).

122. EPA's inability to act on acid rain because of the highly charged nature of the political debate has been recognized by other authors. E.g., Note, Acid Rain and the Clean Air Act: Agency Inaction and the Need for Legislated Reform, 6 VA. J. OF NAT. RES. L. 213-18 (1986).

A. Promising Activity in the Last Congress

Perhaps due to a growing awareness in 1988 that the political winds were shifting and that it was time to "strike a deal" on acid rain,\textsuperscript{124} there were several compromise acid rain bills or proposals which showed signs of success in the last weeks of the 100th Congress.

1. The Mitchell Compromise

One of the more hopeful breakthroughs came in late September, 1988 when Senator George Mitchell reached a compromise on acid rain after negotiating with several key senators and United Mine Workers president Richard Trumka. Although Senator Byrd never publicly endorsed the proposed compromise, he was known to have been meeting with Senator Mitchell and with Trumka on the subject.\textsuperscript{125}

The proposal called for a ten-million ton reduction in $S\textsubscript{0\textsubscript{2}}$ emissions (below 1980 levels), with such reductions to occur in two phases: the first phase involving a reduction of 4.5 million tons by 1995, and the second phase involving a reduction of the remaining 5.5 million tons by 2003.\textsuperscript{126}

Critical to the compromise were provisions for a subsidy program which would have aided designated utility plants to install new coal burning technology, as opposed to simply switching to low sulfur coals. The subsidy would have allowed $150/kw for capital costs of new construction and would have been funded by a national fee on the generation of electricity from facilities using fossil fuels and emitting $S\textsubscript{0\textsubscript{2}}$ at a rate greater than 1.0 lb./mm Btu.\textsuperscript{127}

While Senators Mitchell and Byrd were reportedly close to agreement on the compromise, last minute disagreements among other

\textsuperscript{124} Environment Leaders Seek Acid Rain Compromise to Revive Senate Clean Air Bill, ENVIRONMENTAL AND ENERGY STUDY INSTITUTE, SPECIAL REPORT (July 20, 1988).

\textsuperscript{125} Senate Clean Air Talks Accelerate, ENVIRONMENTAL AND ENERGY STUDY INSTITUTE, SPECIAL REPORT 2 (Sept. 26, 1988).

\textsuperscript{126} The compromise proposal was reduced to an outline of amendments which could have been applied to pending acid rain legislation, but it was never drafted in bill form.

\textsuperscript{127} Id.
senators, industry and environmental groups prevented a bill from reaching the Senate floor before adjournment.\textsuperscript{128}

2. The Ohio/New York Compromise

A second significant development came last year from two states which had previously been at opposite ends of the acid rain debate. After years of disagreements between northeastern states and midwestern states over whether acid rain should be controlled, Governors Mario Cuomo of New York and Richard Celeste of Ohio made a surprise announcement last year that they would join forces in developing and proposing acid rain legislation to Congress.\textsuperscript{129}

Their proposal, which was introduced in the House of Representatives as H.R. 5032, called for a three-phase, ten-million ton reduction in $\text{SO}_2$ emissions annually by 2003. In addition, nitrogen oxide ($\text{NO}_x$) emissions would be reduced by twenty-five percent (approximately three million tons) from 1980 levels at all stationary combustion sources.\textsuperscript{130} In Phase I of the program, each state would have to achieve an average $\text{SO}_2$ emission rate of 2.0 lbs./mm Btu heat input for all major fossil fuel electric generating units by 1993.\textsuperscript{131} Phase II would require states to achieve an average $\text{SO}_2$ emission rate of 0.9 lbs./mm Btu of heat input.\textsuperscript{132} Finally, in Phase III any state which did not meet the 0.9 lbs./mm Btu emission rate would have to undertake further reductions by January 1, 2003.\textsuperscript{133}

H.R. 5032 also called for the creation of a grant and loan program to pay for fifty percent of the acid rain controls required under Phases I and II.\textsuperscript{134} In addition, a ten-year, $2.5 billion matching grant program would be created to support the rapid deployment

\textsuperscript{128} Compromise Fails: Clean Air Bill Dies, ENVIRONMENTAL AND ENERGY STUDY INSTITUTE, WEEKLY BULLETIN 132 (Oct. 10, 1988).

\textsuperscript{129} H.R. 5032, 100th Cong., 2d Sess. (1988).

\textsuperscript{130} Id. at §§ 180, 181.

\textsuperscript{131} Id. at § 181(a)(1)(A). However, no state would be required to reduce emissions by more than 31%. Id. at § 181(a)(1)(B).

\textsuperscript{132} Id. at § 181(a)(2). There would be a maximum of 52% reduction from total 1980 utility emissions.

\textsuperscript{133} Id. at § 181(a)(3).

\textsuperscript{134} Id. at § 191.
of innovative clean coal control technologies for coal fired boilers.\textsuperscript{135}

The significance of both of these initiatives in the last Congress is that they represented, for the first time, good faith efforts by factions on both sides of the acid rain debate to reach a legislative solution. Critical to both are provisions for funding at least part of the capital costs of new control technologies in order to facilitate emissions reductions without massive switching from high-sulfur to low-sulfur coals and the resultant disruptions in the coal industry.

B. Needed Components for Acid Rain Legislation in the New Congress

Given the history of footdragging by EPA since the 1977 amendments to the Clean Air Act, Congress must enact acid rain legislation which denies EPA discretion on the central issues of total emission reductions and statewide average emission rates for sources. Moreover, given the amount of damage that has already occurred, any new enactment must ensure that the total emissions reductions of $\text{SO}_2$ and $\text{NO}_x$ are sufficient to eliminate the adverse effects to human health, property and the environment. Finally, any new legislation must provide financial incentives for the installation of clean coal technologies in order to minimize the disruptions feared by the coal industry.

C. Senate Bill 1894 as a Model

While the compromise proposals previously discussed include many of the components for sound legislation, they are, nevertheless, compromises from what will ensure adequate protection of human health and the environment. The Mitchell compromise, for example, represented a retreat by Senator Mitchell from the terms of Senate Bill 1894,\textsuperscript{136} a bill which the Senate Environment and Pub-

\textsuperscript{135} Id. at §§ 195, 198. "Clean coal technology" means any technology, including technologies applied at the precombustion, combustion, or post-combustion stage, deployed at a new or existing facility which will achieve significant reductions in air emissions of sulfur dioxide or oxides of nitrogen associated with the utilization of coal in the generation of electricity which is not in widespread use at commercial scale as of the date of enactment of this part. Id. at § 196.

\textsuperscript{136} S. 1894, 100th Cong., 1st Sess. (1987).
lic Works Committee had already voted out as a comprehensive Clean Air Act revision.

Senate Bill 1894 proposed a twelve-million ton reduction in $S_0_2$ emissions within twelve years. Since a reduction of this magnitude was designed to protect all but the most sensitive aquatic ecosystems, lesser reductions would likely be insufficient to curb adverse effects. In order to allow sufficient time for a smooth transition to tighter emissions, the reductions were to be introduced in three phases: eliminating five million tons in the first five years, five million additional tons in ten years, and two million more by the twelfth year. Leaving no discretion to EPA to set utility emission limits, the bill also called for each state to achieve $S_0_2$ emissions of no greater than 0.9 lb./mm Btu. Like the compromise bills, Senate Bill 1894 also provided for a clean coal technology program wherein fifty percent of capital costs and operating costs for two years would be federally funded on approved projects.

Senate Bill 1894 also contained $N_0_x$ provisions which are overlooked in other bills. The bill called for four million tons in re-

137. While several compromise proposals suggest 10-million ton reductions of $S_0_2$, there is ample technical support that 12 million tons, or 50% of 1985 emissions, is necessary to protect the environment. The National Acid Precipitation Assessment Program reported 1985 $S_0_2$ emissions at 21.5 metric tons, or approximately 23.7 U.S. tons. NAPAP, Interim Assessment: The Causes and Effects of Acid Deposition, Vol. II, Emissions and Control 1-35 (1987) [hereinafter NAPAP, Interim Assessment]. The National Academy of Sciences (NAS) has now endorsed the concept of "linearity" between reductions of $S_0_2$ emissions and corresponding reductions in deposition at receptor points. NATIONAL RESEARCH COUNCIL, NATIONAL ACADEMY OF SCIENCES, Acid Deposition: Atmospheric Processes in Eastern North America at iii (1983). Current research suggests that a reduction in $S_0_2$ deposition to levels below 20 kg/ha/yr (about 50% below current levels) would be necessary to protect all but the most sensitive aquatic ecosystem. United States - Canada, Memorandum of Intent on Transboundary Air Pollution, Executive Summaries, Work Group Reports at 1-7 (Feb. 1983); E. Gorham, Acid Rain and Aquatic Ecosystems: The Target Loading Question, Report Delivered at the Intergovernmental Conference on Acid Rain Presented by the Conference of New England Governors and Eastern Canadian Premiers 94 (April 10-12, 1985).

139. Id. at § 182(a)(1).
140. Id. at 193(h).
141. Id. at § 301. Nitrate contributions to precipitation acidity in the northeast have increased significantly since the mid-1950's. NAS REPORT, supra note 13. $N_0$, emissions are projected to increase by 50 to 60% between 1985 and 2030 without new controls. NAPAP, Interim Assessment, Vol. II, supra note 137, at § 3.3. Nitrates may even be more deleterious than sulfates during snowmelt episodes in the northeast. NAPAP, Interim Assessment, Vol. I, supra note 137, at § I.3.9.
ductions of NO\textsubscript{x} emissions from 1980 levels.\footnote{142 S. 1894, supra note 136, at § 181.} NO\textsubscript{x} emissions at all major stationary fossil-fuel sources were to be held to limits spelled out in the bill.\footnote{143 Id. at § 182(a)(2).} In addition to NO\textsubscript{x} reductions from major stationary sources, the bill called for further reductions from such "mobile sources" as cars and trucks.\footnote{144 Id. at § 301.}

In short, Senate Bill 1894 represented a far more comprehensive response to the acid rain problem than the compromise legislation, which tended to understate the total amounts of SO\textsubscript{2} reductions necessary to protect public health and the environment and which undervalued the need for NO\textsubscript{x} reductions from both stationary and mobile sources.

D. Legislation Appears Likely

Given the increased tempo in negotiations during the last session of Congress, continued initiatives toward acid rain legislation in 1989 seem likely. With Senator Mitchell, a major proponent of legislation, assuming majority leader status in the Senate and with Congressman John Dingle already talking about the need for a bill in the House,\footnote{145 Wall Street Journal, Dec. 2, 1988, at 1, col. 3.} the probability of floor votes in both houses also looks likely.

Perhaps the greatest change in the political climate, however, comes from the White House. President Bush made it very clear during his campaign that "the time for simply studying the acid rain problem is past."\footnote{146 George Bush for President, Campaign Promotional Brochure (August 31, 1988).} The President promised to "[s]upport a program to cut millions of tons of sulfur dioxide emissions by the year 2000, and to significantly reduce nitrogen oxide emissions."\footnote{147 Id.}

If all these signals are to be believed, then 1989 will see significant progress toward, or enactment of, an acid rain bill.

VI. CONCLUSION

Senator Byrd's observation last year that this is a "pivotal time for the future of our nation's coal industry"\footnote{148 Supra note 1.} is especially apt in
the acid rain debate. With the President and the Congress moving ahead with initiatives for acid rain legislation, the question is no longer whether there soon will be an enactment on acid rain. Rather the debate is over the format and composition of a new law. Instead of pretending that the problem will go away if ignored, the coal industry and labor should be actively participating in finding a solution. It is nearly certain that the next ten years will see significant reductions in \( \text{SO}_2 \) and \( \text{NO}_x \) emissions. Given this fact, industry should be advocating solutions which will not only solve the acid rain problem but will incorporate clean coal technologies and other mechanisms to avoid undue economic disruptions. What industry and labor need to realize, however, is that the victims of acid deposition have suffered the ill effects of this pollution too long simply to settle for a bill which goes only halfway towards solving the problem.