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Nancy J. Rich

Assoc., Bell, Boyd & Lloyd, Chicago, IL.

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THE CLEAN AIR ACT AMENDMENTS OF 1990: CLEAN AIR AT WHAT COST?

Nancy J. Rich*

I. Introduction

The Clean Air Act Amendments of 1990¹ ("Amendments") transform the federal statute which regulates air pollution into a behemoth of over 700 pages in length. The Amendments add substantial new requirements to the Clean Air Act of 1970,² as previously amended in 1977.³ Even a cursory review of the Amendments demonstrates that their requirements will affect the cost and availability of many consumer goods and services, including gasoline, electricity, dry cleaning, automobiles, and aerosols.

The United States Environmental Protection Agency ("EPA") estimated that the Amendments as originally proposed would carry an economic price tag of \$19.5 billion, while industry groups estimated the total costs at as much as \$40 billion.⁴ EPA estimates that half of the Amendments' cost will be incurred by 1995, and the other half by 2005.⁵ One environmental group official has estimated that the Amendments will cost the average American household approximately \$300 to \$400 per year.⁶ Although this cost may seem high, a study prepared for the National Clean Air Coalition and National Clean Air Fund contends that even in 2005, the cost per household will be less than current average household expenditures for tobacco products and alcoholic beverages.⁷

The Amendments will affect more heavily those regions of the country which have not met national ambient air quality standards promulgated under Section 109 of the Act,⁸ those which rely on the production or use of high-sulfur coal, and those which have not developed comprehensive emission permit programs. Particular types of businesses, such as automobile and component parts manufacturing, coal-powered utilities, gasoline suppliers and companies that use chemicals affected by new

prohibitions, will also be regulated more heavily than other businesses.

Many of the most stringent aspects of the Amendments appear to result from the failure of the prior Clean Air Act amendments enacted in 1977 to achieve the standards they set for attainment of better air quality. EPA has determined that the most widespread pollution problems in the United States are caused by emissions of nitrogen oxides and hydrocarbons, including volatile organic compounds ("VOCs") which cause ozone formation, commonly known as smog. Carbon monoxide and small particulate matter are additional causes of these EPA-identified pollution problems.⁹

Areas out of compliance with the national health standard for ozone or carbon monoxide pollutants were to have met these standards by 1987.¹⁰ In spite of this statutory deadline, ninety-six cities are still "nonattainment" (that is, failing to achieve compliance) for the ozone standard.¹¹ Forty-one cities are nonattainment for the carbon monoxide standard, and at least seventy areas are nonattainment for the particulate matter standard.¹²

This article will discuss the Amendment provisions most likely to have an impact on the public. Moreover, the article will explain how these provisions will affect consumers. First, the article examines the Title I nonattainment provisions which address ozone. Second, the article explores the Title II motor vehicle provisions, including new emissions standards and reformulated gasoline requirements. Third, a discussion of the Title III air toxics provisions is provided, followed by an examination of the Title IV acid rain provisions and Title V permit requirements. Next, the article will review and discuss other components of the Amendments, such as

chemical ban and enforcement provisions. Finally, the article concludes that because of the public outrage over environmental problems, Congress has likely enacted some provisions to protect the environment despite an unjustified cost to consumers and a dramatic strain on the economy.

II. Analysis of the Clean Air Act Amendments

The following sections are intended to analyze the Amendment provisions most likely to affect consumer goods and services. Potential resulting changes in consumer purchases and costs are also discussed.

A. Title I Nonattainment Provisions

1. The New Requirements Of The Amendments

Section 109 of the Clean Air Act of 1970¹³ requires EPA to establish national ambient air quality standards for air pollutants. The Amendments divide areas that fail to meet the ambient air quality standards into categories, depending on the severity of the problem, and set different compliance requirements for each category. An area may be classified as nonattainment for one type of pollutant regulated under the standards, such as ozone, and attainment for others.¹⁴ The category into which an area is classified determines the compliance measures it must implement and the amount of time it has to attain compliance.

There are five categories for ozone: marginal, moderate, serious, severe and extreme. The severe class is divided into two subclasses. Depending on their

Nancy Rich is an associate with the law firm of Bell, Boyd & Lloyd, concentrating in environmental law. Ms. Rich received her A.B. and J.D. from Loyola University of Chicago. She is the author of "Hazardous Waste Cleanup Enforcement Under CERCLA" published in the National Environmental Enforcement Journal.

classification, the ozone nonattainment areas must attain the health standard set for ozone within a specified period ranging from five to seventeen years, except that Los Angeles is given twenty years to comply with the ozone standard.¹⁵ Los Angeles is the only area classified as extreme. There are three highly severe areas, five severe areas, sixteen serious areas, thirty-five moderate areas and thirty-nine marginal areas.¹⁶ Nonattainment areas for carbon monoxide or particulate matter are classified as either moderate or serious and, like ozone nonattainment areas, subject to regulatory measures based on the progress that is needed to achieve attainment.¹⁷

More areas are nonattainment for ozone than for any other pollutant.¹⁸ EPA believes that a key feature of the Amendments' provisions to control ozone is that all nonattainment areas except those classified as "marginal", which are closest to compliance, must immediately begin to reduce their emissions. In all ozone nonattainment areas which are not classified as marginal, the Amendments require a fifteen percent reduction over the first six years and an additional nine percent reduction for each three year period thereafter. These nonattainment areas must cut their emissions of VOCs by three percent per year (with waivers for certain specified conditions) until they achieve attainment.¹⁹

Vehicle inspection and maintenance programs must be upgraded in areas that do not meet the ozone and carbon monoxide standards. Most nonattainment areas that do not have vehicle inspection programs will be required to establish them.²⁰ The cost to consumers will be in the form of time and money needed to travel to testing stations and in ensuring that their vehicles are maintained and equipped to pass the emissions test.

Under the 1977 law, any major new source or major modification of any source of hydrocarbon emissions (generally one hundred tons per year or more emissions)²¹ in a nonattainment area was required to meet tougher standards than those applied to new sources and major modifications of sources in

attainment areas.²² For example, a new manufacturing facility built in a nonattainment area would be required to have emission reduction equipment and or employ innovative manufacturing processes which result in less hydrocarbon pollutants. These controls, under the 1977 Act provisions, included "offsetting" the new source by requiring reduced emissions from existing sources and using the "lowest achievable emission rate" at the new source — that is, the highest level of emission control used by any plant of its type.²³

The current Amendments go even further by (1) increasing offset requirements; (2) tightening "netting" benefits, which allow a source to offset emission increases by reducing emissions elsewhere at its facility; and (3) changing the definition of "major source" to include facilities which emit fifty tons per year in serious areas, twenty-five tons per year in severe areas, and ten tons per year in the extreme area (Los Angeles).²⁴ For example, a dry cleaner which emits twenty-six tons of ozone per year would be a major source in the extreme and severe areas, but not in the serious areas.

2. A Substantial And Unequal Impact on the Public

Permits are issued for air emission sources such as a newly built manufacturing facility. In addition, permits must be renewed at least every five years for existing air emission sources.²⁵ The Amendments require in practical terms that governmental environmental agencies which regulate air emissions in nonattainment areas must significantly reduce allowable emissions in virtually every permit they reissue or modify. Therefore, the Amendments will affect industry more quickly than many other environmental laws which commonly contain greater flexibility to allow delayed compliance dates or compliance exemptions.

Additionally, the Amendments provide that small businesses which have never been regulated will now be subject to new regulatory limits and requirements. The extent of the negative impact on

small businesses is unclear. However, these standards will result in new costs which will almost certainly be passed on to consumers.

Another significant potential effect of the nonattainment provisions is that VOC-emitting manufacturers will be treated "unequally" if their plants are located in ozone nonattainment areas such as the metropolitan areas of Chicago or Detroit. In order that nonattainment areas may achieve attainment status, these plants will likely be required to achieve significantly greater VOC emission reductions than plants in attainment areas. The additional air pollution controls which will be needed in those areas may disproportionately increase local business costs. The increased cost will result either in relocation to other regions or countries or higher prices for consumers in nonattainment areas.

On the other hand, businesses with national or international markets may also choose to spread their nonattainment area compliance costs across their entire market. This spreading of costs could produce smaller cost increases for many consumers. A more uniform increase in costs may be more desirable than large regional increases.

3. Effect On State Environmental Efforts

Like previous versions of the Clean Air Act, the Amendments require each state to ensure that its nonattainment areas achieve attainment status within the legally mandated time periods. State implementation plans are generally comprised of state laws and regulations which contain air pollution control rules and limit emissions from specific sources.²⁶ Prior to the Amendments, if a state failed to develop a plan that meets the requirements of the law, EPA was required to promulgate a Federal Implementation Plan.

A federal district court ruling suggests that the general savings clause provided in the Amendments does not generally require EPA to promulgate a federal plan until the state proposes a revised state plan to meet the Amend-

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ments' new requirements.²⁷ The federal government as a result also resorts to pragmatic enforcement mechanisms. The Amendments provide for the withholding of federal highway funds from states which fail to enact adequate state implementation plans and banning construction of new air emission sources.²⁸ Both of these tactics by the government impose heavy burdens on the state governments. Therefore, the states will likely become more active in improving air quality.

4. A Unfair Strain On Urban Areas?

Senator Steve Symms (R. ID), argued during the Senate debate on the Amendments that the nonattainment title is a "neutron bomb" provision. Symms predicts that the tough air standards combined with the lack of available offsets will drive businesses and their workers from inner city nonattainment areas, leaving only the vacated buildings.²⁹ The dilemma faced by Congress, once it decided that attainment must be achieved, was that the areas which must be most strenuously regulated are urban areas with severe social and economic problems.

The Amendments provide plainly that air quality in nonattainment areas must be improved to achieve attainment — regardless of the economic and social costs to cities. In other words, the Amendments force those areas with the worst economic problems to shoulder most of the economic burden. By enacting various provisions which apply only to nonattainment or urban areas, Congress has determined either that the benefits of attainment simply outweigh these policy considerations or that the threat to urban economies has been overstated.

B. Title II Motor Vehicle Provisions**1. Background**

Even prior to the enactment of the Amendments, the United States' motor vehicle emission control program was the most

stringent in the world. Compared to cars built in the 1960s, which were not subject to controls, today's cars produce eighty percent fewer hydrocarbons and sixty percent less nitrogen oxides.³⁰ But much of this "per vehicle" reduction has been offset by the growth in the number of vehicles and miles driven. In the last twenty years, miles driven have doubled.³¹

As a result, the Amendments attempt to address this issue by requiring more controls on vehicles and mandating the use of cleaner burning fuels in those areas with the most serious attainment problems. The cost of manufacturing, purchasing and operating cars, trucks and other motor vehicles will increase as a result of the Amendments. Additional emission control requirements and mandated use of cleaner fuels in nonattainment areas will be the primary source of these new costs.

Although a number of attempts have been made to estimate the total cost of the motor vehicle provisions to consumers, these estimates vary widely and are recognized as uncertain. For example, the National Clean Air Coalition estimated prior to enactment that the cost will be about \$173 per passenger car *if* the House bill's version of the "cold tailpipe" standards for carbon monoxide emissions at cold temperatures was retained in the Amendments and *if* the "Tier II" standards — that is, the requirements scheduled to take effect after 2000 — are not needed to achieve attainment.³² The final conference agreement adopted a compromise between the House and Senate cold tailpipe emissions standards which will impose stricter standards than might have been imposed under the House bill beginning in 2002; these standards will take effect, however, only if EPA determines that in June, 1997 more than six areas are nonattainment for carbon monoxide.³³

The National Clean Air Coalition Study conceded that if the Senate cold tailpipe emissions standards and the Tier II controls are required, the estimated per car costs may increase another \$3.04 to \$12.15 per month.³⁴ Robert W. Crandall, a noted critic of the

Clean Air Act and the 1990 Amendments, is much more pessimistic. He estimates that the Amendments' motor vehicle provisions will alone add \$3.5 billion to annual pollution control costs.³⁵

1. New Emissions Standards

Among the most important vehicle emissions control provisions for consumers are those which set new tailpipe standards for cars and trucks. Title II of the Amendments requires auto manufacturers to reduce tailpipe emissions of hydrocarbons and oxides of nitrogen by thirty-five and sixty percent, respectively, beginning with forty percent of the vehicles sold in 1994 and increasing to one hundred percent of vehicles sold in 1998. Comparable reductions are required for light trucks, such as vans and pickups. An additional reduction in auto emissions, which will be fifty percent below the standards required in the mid-1990s, will be required after 2003, but not later than 2006, unless EPA determines that this new standard will not be necessary, technologically feasible or cost-effective.³⁶

2. On Board Emission Controls

One of the ways in which the reduction will be achieved is through "on board controls" in new cars. On board control vehicles will carry collection equipment (simple charcoal canisters) to capture refueling vapors, allowing them to be burned in the engine as fuel. On board controls will be promulgated in EPA regulations after EPA consults with the Federal Department of Transportation ("DOT") regarding safety issues.³⁷ Vehicle manufacturers are also required to install systems to alert drivers when an emission control system is malfunctioning.³⁸ The California motor vehicle emission standards, which are the most stringent emission standards in the country, may now be adopted and enforced by other states. The Amendments specify, however, that the states which adopt the California requirements may not do so in a piecemeal fashion that would require manufacturers to create a "third vehicle" that is not a California vehicle or a forty-nine state vehicle.³⁹

As noted above, the Amendments also set a "cold tailpipe" emission standard for carbon monoxide emissions. Past tailpipe standards required measurement at seventy-five degrees, even though cold weather reduces the effectiveness of catalytic converters. EPA estimates that a car started at twenty degrees emits over ten times more carbon monoxide than the same car started at seventy degrees.⁴⁰ As a result, manufacturers will be required to increase the cold weather effectiveness of catalytic converters. These costs will likely be passed on to car buyers.

The Amendments shorten the generally applicable warranty period for light-duty vehicle and light-duty truck emission control components costing \$200 or less. In 1995, the warranty period will become two years or 24,000 miles. The Amendments extend the required warranty coverage, however, for major components costing more than \$200 — *e.g.*, catalytic converters, on board diagnostics and the electronic control system. Beginning in 1995, these components must be warranted for eight years or 80,000 miles.⁴¹

The warranty provisions appear to strike a compromise between manufacturer and consumer interests. Consumers receive extended protection from large costs for repair and replacement of emission control equipment, while manufacturers have only a limited responsibility to fix or replace less costly items. This approach also may be more politically acceptable to consumers because they are shielded from the largest pollution control expenses, which might break a monthly household budget.

3. Emissions From Fleet Vehicles

A program requiring reduced emissions from fleet vehicles in certain ozone and carbon monoxide nonattainment areas is also included in the Amendments.⁴² "Fleet vehicles" include urban buses and other fleets of ten or more vehicles that are, or can be centrally refueled, but do not include vehicles garaged at personal residences each night under normal circumstances. A "clean fuel vehicle" is a vehicle which has

been certified to meet the clean fuel vehicle standards applicable to clean fuel vehicles of its type and model year.⁴³

The fleet program will mandate that specified percentages of these vehicles (thirty percent in 1998, fifty percent in 1999, and seventy percent in 2000) shall be "clean fuel vehicles" and meet California's low emission vehicle ("LEV") standards for light-duty vehicles and light-duty trucks below 6,000 lbs. gross vehicle weight rating ("gvwr"), if these vehicles are offered for sale in California. By 2001, all of these vehicles must meet the LEV standards without regard to whether they are sold in California.⁴⁴ The California LEV standards are significantly lower than standards which apply to conventional cars and other light-duty vehicles. For example, the California LEV tailpipe standards for nonmethane organic gases allows less than one third of the emissions permitted under the conventional car standard.⁴⁵

Beginning in model year 1998, fleet operators in covered areas must ensure that at least fifty percent of the new heavy-duty fleet vehicles above 8,500 lbs. gvwr which they purchase are clean-fueled vehicles and that the vehicles use clean alternative fuels when operating in the covered area.⁴⁶ The "fleet program" of the Amendments is a further illustration of how the Amendments extend environmental regulations and their costs to formerly environmentally unregulated industries and business operations.

4. Mass Transit Emissions

Some of the substantial costs of the Amendments' motor vehicle provisions will affect urban mass transit systems and their riders. The Amendments establish three key regulatory requirements for urban mass transit buses. First, by January 1, 1992, EPA must promulgate emission standards which will apply to all new buses for model year 1994 and thereafter. These standards must require that particulate matter emission levels will not exceed fifty percent of the emissions allowed for heavy-duty vehicles in 1994. If EPA finds that

the fifty percent standard is not technologically achievable, it may relax the standard to thirty percent of the allowable heavy-duty vehicle emissions.⁴⁷

Second, EPA must conduct yearly tests beginning in 1994 to determine whether the buses are meeting the standards and remaining in compliance throughout their useful lives. If EPA finds that buses are not meeting the 1994 standard, it must implement a low-polluting fuels program for buses in large cities.⁴⁸ EPA believes that methanol or compressed natural gas could be used as a low polluting fuel because such engines will be offered for sale beginning in 1991.⁴⁹

Third, by November 15, 1991, EPA must promulgate retrofit regulations for urban buses which were built prior to model year 1994.⁵⁰ These regulations must require the use of the best retrofit technology then available on all buses which have their engines replaced or rebuilt. This requirement may ultimately encourage urban mass transit systems to purchase new buses rather than rebuild old ones if they determine that the added retrofitting costs produce insufficient added useful life when compared to the cost of new buses.

The added costs which may be reflected in increased passenger fares are difficult to quantify due to the divergent cost estimates advanced by analysts and the varying types of equipment used by mass transit systems.⁵¹ In addition, this impact may be lessened for systems which, for example, may rely more heavily than others on electric trains. A system which relies solely on diesel-fueled buses, on the other hand, will feel a more severe impact. One aspect of all of this is certain: all urban mass transit systems will now face increased regulatory costs.

5. Non-Road Engine Emissions

The Amendments also allow EPA to regulate non-road engines after studying emissions from these engines.⁵² Prior to the Amendments, EPA had no authority to regulate emissions from non-

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road engines, such as those used in power boats, bulldozers, and farm and lawn equipment. EPA's study must be performed by November 15, 1991, and regulations must require the greatest degree of emission reduction achievable for those engines which EPA determines contribute significantly to urban pollution.

Lawn equipment, which is used by virtually all urban and suburban homeowners, is probably the most likely of the non-road equipment to be affected by these engine regulations. It is reasonable to expect that resulting regulations will require manufacturers to purchase or build emission controls into these engines, and that they will pass their increased costs to consumers in the form of higher prices.

Standards for new locomotives are required within five years of the Amendments' enactment.⁵³ If the locomotive standards require significant expenditures by railroad transportation companies, it is also reasonable to expect that the price of goods transported by rail will increase. The Amendments do not direct EPA to promulgate standards which will apply only to non-road engines or locomotives sold or used in nonattainment areas. The burden of these regulations, like the light-duty vehicle regulations which apply to automobiles and other small vehicles, thus will be borne by consumers in both attainment and nonattainment areas.

6. Reformulated Gasoline

Consumers who live in the nine cities with the most severe ozone pollution — Los Angeles, Baltimore, Chicago, Houston, Milwaukee, New York City, Philadelphia, San Diego and Hartford — will likely pay higher gasoline prices as a result of the Amendments. Title II of the Amendments mandates the use of cleaner, reformulated gasoline in these areas by 1995.⁵⁴ States may elect to apply these requirements in other cities with ozone pollution problems. Reformulated gasoline must have fifteen percent lower emissions of VOCs

and toxic chemicals by 1995, and even greater reductions by 2000. Additional standards are provided for oxygen, benzene and aromatics.⁵⁵

Detergents which control engine deposits that can cause combustion problems and emission increases must be added to all gasoline nationwide. Beginning in 1992, all gasoline must be oxygenated during the winter months in the forty-one areas which are nonattainment for carbon monoxide.⁵⁶ Adding oxygen to gasoline improves its combustion, which reduces carbon monoxide.⁵⁷ EPA estimates that reformulated fuels will raise gas prices by at least six cents to eight cents per gallon.⁵⁸

7. Non-Uniform Application Of Motor Vehicle Requirements

While the reformulated gasoline, urban bus, and fleet program requirements of the Act affect directly only those consumers who live in nonattainment areas, all of the motor vehicle requirements are not so circumscribed. Unfortunately for consumers in nonattainment areas, the auto emission control requirements, which are the motor vehicle controls most likely to directly and significantly impact consumers, are not limited specifically to only those areas where the targeted pollution problem exists. As noted in one study which is critical of the provisions of the Amendments imposing nationwide controls, the new standards which auto manufacturers will be required to meet can only be justified by the current smog situation in the most polluted areas, such as southern California.⁵⁹

On the other hand, this criticism fails to consider that without these additional controls, more areas may become nonattainment. Polluting activities may increase as the population grows in size and affluence, as is evidenced by the doubling in twenty years of the annual number of vehicle miles driven.⁶⁰ In order to avoid burdening auto manufacturers with differing regional standards based on the air quality in the area where vehicles will be used, Congress opted for uniformity — requiring states to impose either the Amend-

ments' standards or the even more stringent California emission standards. As a result, consumers in attainment areas will be required to purchase vehicles with emission controls which are almost certainly unnecessary for the areas in which the vehicles are likely to be operated.

C. Title III Air Toxics Provisions**1. Background**

Hazardous air pollutants, also referred to as "air toxics", are regulated under Section 112 of the Clean Air Act.⁶¹ Prior to the Amendments, Section 112 defined a hazardous air pollutant as a pollutant to which no ambient air quality standard is presently applicable and which in the judgment of EPA "causes or contributes to air pollution which may reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness."⁶² Pursuant to Section 112(b),⁶³ EPA was required prior to the Amendments to publish and periodically revise a list of hazardous air pollutants and set national emissions standards. In order to regulate a pollutant as an air toxic, EPA was required to prove that its air toxic regulation for the pollutant protected public health with "an ample margin of safety to protect the public health" from the pollutant.⁶⁴

EPA acknowledges that "(t)he way the 1977 Clean Air Act addressed air toxics has failed."⁶⁵ As a result of the uncertainty of the weight which must be given to various factors, air toxics rulemaking was stymied while courts addressed legal challenges to EPA's methodology. After EPA's air toxics standard for vinyl chloride was vacated by the Court of Appeals for the District of Columbia in 1987,⁶⁶ EPA was required to redesign its approach to air toxics regulation. The court held that the vinyl chloride standard was invalid because EPA did not make any finding in its promulgation regarding the standard's effect on human health. The court found that EPA's duty under Section 112 to provide an "ample margin of safety" in its air toxics standards initially required EPA to determine the level

of exposure to vinyl chloride which was "safe" — that is, at which public health would be protected. While EPA could consider cost and technological feasibility under the old Section 112, unlike Sections 109⁶⁷ and 110,⁶⁸ the court held that EPA could not do so until *after* its initial determination based on public health. The court found that EPA's decision of what is "safe" must be based upon an expert judgment with regard to the level of emissions that will result in an "acceptable" risk to health. Only then was EPA allowed to set the emission standard at the lowest safe level that was technologically feasible.

EPA subsequently developed a regulatory formula based on the vinyl chloride decision. In the first step of its inquiry, EPA will consider the extent of the estimated risk to an individual exposed to the maximum level of a pollutant twenty-four hours a day for a seventy year lifetime. If the risk to that individual is no higher than approximately one in 10,000, then EPA will generally presume that the risk level is an "acceptable" risk to health and perform the second part of the required analysis.⁶⁹ EPA noted, however, that the distribution of risks in the exposed population, the uncertainties associated with scientific risk assessments, and the weight of evidence that a pollutant is harmful to health must all be considered. EPA believes that it should reduce risks to less than one in one million for "as many exposed people as possible."⁷⁰

2. The New Air Toxics Scheme

The air toxics provisions of the Amendments have been severely criticized in the scientific community.⁷¹ Instead of requiring EPA to continue to set health-based standards under its regulatory formula, the Amendments require EPA to develop technology-based standards. The public's actual exposure to a regulated pollutant and whether and to what extent that exposure affects public health are only secondary factors in setting the standard. The focus is what emissions reduction *can* be achieved, not whether the benefits of the reduc-

tion justify the cost of achieving it.⁷²

Several provisions of the air toxics provisions illustrate this focus. First, the requirement that EPA find that a pollutant meets the prior definition of "hazardous air pollutant" has been removed from the Act. "Hazardous air pollutant" is now defined as any of the 189 pollutants listed in Title III.⁷³ EPA is required to regulate each of these air toxics, and any others which it may later add to the list.

3. Phase One—Technology Based Controls

Second, unlike Section 112 prior to the Amendments, air toxics regulation will occur in two tiers or phases, the first of which is almost exclusively technology-based. This first phase requires EPA to regulate these air toxics, and any others which it may later add to the list, by mandating installation of "maximum available control technology" ("MACT")⁷⁴ at sources which emit the air toxics. In determining what is the maximum "achievable" level of control technology, EPA need only "take into consideration" cost, non-air quality health and environmental impacts and energy requirements.

While MACT for existing sources need not be as stringent as required for new sources, it may not be less stringent than the average emission limitation achieved by the top twelve percent of existing sources prior to promulgation of the MACT standard. If a category or subcategory of sources has less than thirty sources, MACT cannot be less than the average emission limitation achieved by the five best performing sources.⁷⁵ A threshold safety level may be considered only in establishing MACT for proven non-carcinogenic pollutants, when EPA is allowed to use its "ample margin of safety" regulatory approach developed in response to the vinyl chloride decision.⁷⁶

Third, the Amendments require EPA to regulate air toxics emissions from sources which were previously not subject to regulation. No later than November 15, 1991, EPA will publish a list of source categories which emit one

or more of the listed compounds. Both "major sources" and "area sources" must be included on the list. A major source is a facility which emits more than 10 tons of any single listed pollutant or more than twenty-five tons of any combination of listed pollutants per year.⁷⁷ Prior to the Amendments, the definition of "major source" generally reached only those facilities which emitted one hundred tons of regulated pollutants per year.⁷⁸ EPA may lower these thresholds for regulated pollutants which it determines are very toxic.

In addition, EPA's regulatory authority extends beyond major sources to smaller area sources, which may include dry cleaners, auto body shops and other small local businesses. An area source is one which emits pollutants below the threshold required for classification as a major source. EPA must list enough area source categories on the source category list to account for ninety percent of the nationwide area source emissions of 30 target pollutants. EPA must select these target pollutants on the basis of studies it performs to determine which area source pollutants are most hazardous. By November 15, 1995, EPA must develop and report to Congress an urban air toxics strategy to reduce emissions from area sources to reduce the cancer incidence attributable to these sources by seventy-five percent.⁷⁹ Small businesses, which may be less able than large companies to absorb costs of regulation, therefore may need to weigh their ability to continue their regulated activities. If EPA's study produces additional regulations which pertain only to small businesses, they may face a further competitive disadvantage against their bigger rivals.

EPA must promulgate MACT standards for forty source categories and coke ovens not later than two years after the date of enactment — that is, no later than November 15, 1992. Standards for twenty-five percent of the remaining source categories on the list are due four years after enactment of the Amendments, and for another twenty-five percent in seven years.

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All of the source categories must be regulated within ten years — that is, no later than November 15, 2000.⁸⁰

The Amendments contain a “hammer” provision which prevents sources from escaping regulation in the event that EPA fails to meet its promulgation deadlines. All sources that would have been subject to a standard which EPA failed to promulgate must obtain a permit within eighteen months of when promulgation was scheduled, and an independent engineer must certify that the permitted level of control is the “best” level of control for the source.⁸¹ In practice, the level of control certified by engineers under the hammer provision will probably not be as stringent as the subsequently promulgated regulatory standard, because it will be more difficult for EPA to prevail on an appeal of its permit denials in the absence of the regulatory standard. Further, the engineer’s financial relationship with the company will make it more difficult for him or her to refuse to certify any reasonably stringent level of control which is not the most stringent control level.

Existing sources must comply with MACT standards no less than three years after they are issued unless they qualify for one of the Act’s very limited exemptions or extensions. For example, the EPA Administrator or a state may grant a one year extension for compliance, but only one such extension may be granted.⁸²

4. Phase Two—Residual Risks

The second tier or phase of the air toxics program requires EPA to address the residual risks which will remain after implementation of the MACT standards. No later than November 15, 1996, EPA must submit a report to Congress which evaluates the risk remaining from the pollutants, the public health significance of those risks, and recommendations, regarding legislation to address those risks. If Congress “does not act” on EPA’s recommendations EPA must, within eight years of its enactment

of standards for each particular source category, subsequently promulgate second tier “residual risk” standards for the category.⁸³

The action which Congress may eventually take regarding second tier standards will likely depend on the study of risk assessment issues by a Risk Assessment and Management Commission.⁸⁴ The history of the Amendments suggests that Congress is concerned that the scientific uncertainty of risk assessments and the resulting lack of confidence in them may warrant legislation which adopts a different regulatory approach.⁸⁵ Congress could therefore choose to abandon risk-based standards altogether and revert to the first tier technology-based approach.

The Amendments also address the accidental releases of air toxics. EPA is required to list at least one hundred chemicals which are extremely toxic when accidentally released and to promulgate regulations for the prevention of accidental releases.⁸⁶ All facilities which handle any of the listed substances will be required to prepare and file a hazard assessment and risk management plan.⁸⁷ The Amendments also create a chemical safety board which will investigate major chemical accidents.⁸⁸

5. Impact On The Public

The impact of the air toxics regulations on consumers will depend on the industries EPA chooses to regulate, the timing of its regulations, and the stringency of the regulations it ultimately enacts and enforces. In the event that the production process does not emit pollutants which EPA believes produce the most significant risks to human health and the environment, EPA may place these industries in the last group for which it enacts MACT regulations. As noted above, this last group of regulations need not be enacted for nearly ten years. EPA faces an extraordinary regulatory task under the Amendments’ air toxics provisions. Only a month after the Amendments’ enactment, EPA had already identified approximately 750 air toxics source categories that emit one or more of the 189 regulated pollutants.⁸⁹

EPA’s ability to promulgate regulations for all of these categories in the time required by the Amendments, if possible at all, will require a Herculean effort by numerous federal employees. These public employees will also be required to defend the legal challenges which are likely to result from the proliferation of new standards. As a result, the cost of providing salaries and benefits to these workers is an additional significant regulatory expense which will be borne in the taxes of both corporate taxpayers and individual consumers. A significant though less obvious environmental cost will be incurred by research and other programs where these workers might otherwise be employed.

D. Title IV Acid Rain Provisions

1. Standards For Emissions Reduction

The Amendments require that emissions of sulfur dioxide and nitrogen oxide, which are alleged causes of acid rain, must be cut by approximately one-half by the year 2000. The acid rain controls will effect the sulfur dioxide reduction in a two step process — half of the reductions by January 1, 1995, and the remainder by January 1, 2000. EPA must promulgate controls for nitrogen oxide emissions from utility boilers no later than May 15, 1992, and establish additional emissions regulations for other types of boilers by January 1, 1997.⁹⁰

By January 1, 1995, the 111 largest sulfur-emitting electric utility plants in twenty-two states must reduce emissions to 2.5 pounds of sulfur dioxide per million British Thermal Units (“BTU”). The Amendments name the utilities which currently emit more than the 1995 limit for sulfur dioxide.⁹¹ These high-emission utilities may delay their compliance date until January 1, 1997 if they use devices known as “scrubbers” to clean the high-sulfur coal which causes their excess sulfur emissions. If scrubbing is used to postpone the compliance date at all of these plants, however, it may produce as much as thirty million tons of sludge per year, which

arguably only translates the air emissions problem into a waste disposal problem.⁹² By 2000, sulfur dioxide emissions must be limited to 1.2 pounds per million BTU.⁹³

2. Emissions Trading And Credits

Utilities' compliance requirements may be made more flexible as a result of emissions credits available to them under the Amendments. The acid rain emission reductions are designed to be achieved through an "emissions trading" program. Special added emission allowances have been granted to Midwestern states to soften the impact of controls. This is because the Amendments will have an added impact in the Midwest where many utilities and manufacturers rely on regional coal supplies to produce the energy needed for electricity and the production of goods.

Midwest coal contains more sulfur than Western coal and thus produces more sulfur dioxide. During 1995 through 1999, plants in Illinois, Indiana and Ohio will be allocated a total of 200,000 additional sulfur dioxide allowances.⁹⁴ After 2000, another 50,000 annual allowances will be given to plants in ten Midwestern states.⁹⁵ The Midwest's extra emissions trading allowances may be sold by utilities and other companies to other plants to finance installation of pollution control equipment. The Administration believes that the emissions trading program allows the required emissions reduction to occur at the plants where it can be achieved most inexpensively, and that without the trading provisions, the acid rain controls would have cost an additional two billion to three billion dollars annually.⁹⁶

3. The Benefits—Clean Lakes?

In addition to some of the motor vehicle and nonattainment provisions, the acid rain program is one of the few Amendment provisions which imposes pollution controls in only those areas where the targeted pollution problem exists. Nonetheless, the acid rain mandates are probably one of the more controversial provisions contained in the Amendments. Many critics

have charged that Congress simply disregarded the results of a \$500 million dollar study it commissioned to study the effects of acid rain on lakes in the Northeastern United States.⁹⁷

This criticism has been prompted by the study data, which seem to suggest that the acid lakes and acid soils in some parts of the Northeast, which the acid rain provisions are designed to address, may occur naturally rather than as a result of acid rain. The critics argue that the study indicates that current industrial emissions of the so-called acid rain pollutants therefore do not impact the lake areas in a manner which justifies the increased costs and loss of jobs caused by the acid rain provisions.⁹⁸

A cost-benefit analysis by Paul Portney of the environmental group Resources for the Future admits that it is unclear to what extent power plant emissions may contribute to acidified lakes, that acid rain is having virtually no effect on agricultural output, and that acid rain's effects on forests are limited to mountaintops in the Northeastern United States. The analysis also notes, however, that controlling utility power plant emissions is expected to reduce airborne concentrations of sulfate particles by about forty percent in the eastern United States. The analysis argues that experts believe that these particles are among the pollutants which are most harmful to human health, although there is little consensus about whether sulfur dioxide control may reduce sulfate-related deaths or premature deaths in general. A final possible benefit noted in the analysis is an improvement in visibility, which has been classified as an important aesthetic benefit in several scientific studies.⁹⁹

4. The Costs—Higher Utility Bills

The cost of the acid rain program is more easily quantified than are its benefits. Although cost estimates vary, analysts agree that consumer electric bills will suffer the most substantial impact. EPA estimates that the impact of acid rain controls on residential electric bills are minimal. The National Clean Air Coalition study esti-

mates that by 1995, when the first tier of controls is implemented, residential customers in only three states — Indiana, Missouri, and Tennessee — will face electric bill increases of more than one dollar per month. By 2000, the maximum residential user's monthly increase is estimated to be \$2.80 per month.¹⁰⁰

The critics of the acid rain program are less optimistic. It has been estimated that the standards imposed by the Amendments' acid rain provisions could ultimately cost industry and consumers as much as \$8 billion annually in increased electricity costs.¹⁰¹ One study estimates that the cost of electricity in the Midwestern states will be raised twenty percent.¹⁰² Illinois estimates that statewide average rate increases will be about four percent, and that total costs to state utility ratepayers will be nearly \$300 million per year for ten years. In areas served by highly coal-dependent utilities, the state estimates that average rate increases will be fifteen percent or more.¹⁰³

5. The Cost—Lost Jobs

The Midwestern coal industry will be even more directly affected by the acid rain provisions. The state of Illinois estimates that 16,000 workers in its high-sulfur coal industry and related businesses will lose their jobs as a result of the acid rain provisions.¹⁰⁴ Title XI of the Amendments creates and provides \$250 million for job retraining programs for employees displaced by the acid rain provisions of the Amendments. These Department of Labor funds will be used to retrain coal industry workers and other personnel whose jobs will be lost as a result of the decrease in demand for high-sulfur coal produced in Midwestern states.¹⁰⁵

While these funds may assist workers in acquiring new skills, they do not address the problem of bringing employers who require workers with the new skills to coal mining areas. As a result, it is likely that these workers will have to relocate, adversely affecting those local economies which were previ-

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ously based in whole or in part on the high-sulfur coal industry. It is also likely that the workers who are displaced will not benefit directly from the environmental industry jobs which may develop as in response to increasing environmental regulation. The jobs which will be created, such as those in the environmental sector, including environmental manager and environmental scientist,¹⁰⁶ are likely to require post-secondary degrees or education which the displaced workers are not likely to possess even after retraining.

6. An Uneven Regional Burden

Another criticism leveled against the acid rain provisions is that their emphasis on reducing high-sulfur coal utility emissions in the first tier or phase unfairly penalizes the Midwest. Senator Alan Dixon (D. IL), voted against the House-Senate conference agreement on the Amendments for this reason. Senator Dixon argued that ninety percent of the Tier I acid rain reductions are exacted from just nine states, even though these states produce only fifty-one percent of the nation's total sulfur dioxide emissions. He also complained that the acid rain provisions allow eighteen states to increase their sulfur dioxide utility emissions. Eight of those eighteen states were represented on the conference committee while none of the nine states which will be required to contribute ninety percent of the emission reductions were represented on the committee.¹⁰⁷

The acid rain program therefore appears to fall short when the costs to electricity consumers and displaced workers are compared to its uncertain benefits and unequal treatment of the nine states which will bear most of the burden of the first phase or tier of controls. On the other hand, however, the emission allowance trading provisions benefit consumers and the economy by encouraging pollution reductions at the plants which can achieve them most inexpensively. Even outspoken critics of the Amendments agree that the con-

cept of tradeable pollution rights is an economically sound method of reducing pollution levels.¹⁰⁸

E. Title V Permit Requirements**1. Permits—State Implementation and Federal Oversight**

Similar to other regulatory compliance costs, expenses incurred to comply with permit provisions will likely be passed on to the consumers of the permittees' products and services. The regulatory impact of the permit requirements will also vary from state to state as a result of the differing levels of development of state permit programs. For example, the impact of the permit program is likely to be less significant in Illinois, which has a comprehensive construction and operating permit program,¹⁰⁹ than in states which do not have an air emissions permit system. Even in states which already regulate emissions through state permit programs, however, these permits are likely to become more stringent and subject to more frequent review and enforcement under the Title V program.

The Amendments require various sources of air pollution to obtain operating permits that will assure compliance with all applicable requirements of the Clean Air Act. Like the state implementation programs required under Title I, the Amendments place the burden of developing and administering permits squarely on the states. Permits must be obtained by each regulated emission source after EPA has approved a permit program for the area in which the source is located.¹¹⁰ By November 15, 1991, EPA is required to issue regulations establishing the minimum elements of a permit program to be administered by EPA or state or local air pollution control agencies.¹¹¹ Not later than November 15, 1993, each state must submit to EPA for approval a permit program written under state or local law or under an interstate compact.¹¹²

EPA must provide public notice of the submittal and an opportunity for public comment, and approve or disapprove the program within one year of the submittal date. If EPA disapproves the pro-

gram in whole or in part, the state must resubmit the program within 180 days of receiving notice of the disapproval.¹¹³ EPA may impose highway funding sanctions under Section 179 of the Act¹¹⁴ against states which fail to obtain program approval. If a state has not obtained program approval by November 15, 1995, EPA must promulgate and administer the program for that state.¹¹⁵

States may establish permit requirements that are more stringent than the federal program, but state requirements must not be inconsistent with federal requirements.¹¹⁶ For example, the state permit program administered currently in Illinois by the Illinois Environmental Protection Agency pursuant to the Illinois Environmental Protection Act will be allowed to impose tougher air pollution standards than the federal program, so long as the state standards do not conflict with the federal ones. The Amendments anticipate that the costs of operating the permit programs will be provided by permit fees. EPA is allowed to approve a permit program only if the state demonstrates, subject to several minor exemptions, that the program will collect in the aggregate at least \$25 per ton of emissions of each regulated pollutant. Fees and any penalties and interest collected for failure to pay fees must be used solely to cover the direct and indirect costs necessary to support the program, including administrative personnel, compliance monitoring and enforcement.¹¹⁷

2. The Timing Of Permits

Except for permit applications submitted within the first year of the permit program, states and other permitting authorities are required to act on permit applications within eighteen months. Permitting authorities must submit permit applications and draft permits to EPA and to states within fifty miles of the emission source or in which air quality may be affected by the source. EPA may waive this review requirement for non-major sources. States will be granted ninety days to revise permits to meet any EPA objections. If the state fails to revise the per-

mit, EPA will issue or deny the permit.¹¹⁸ Compliance with the permit is deemed compliance with the requirements of the permit program. Permit compliance also may be deemed compliance with other applicable provisions of the Clean Air Act if the permit has been issued in accordance with Title V provisions or if the permitting authority states in the permit that those provisions are not applicable.¹¹⁹

3. Small Businesses

Section 507¹²⁰ of the Act addresses the impact of the permit system on small businesses by requiring each state to amend its implementation plan to establish a small business technical and advisory assistance program. The plan revisions, which are due no later than November 15, 1992, must include a compliance assistance program, a designated ombudsman, adequate procedures for providing information regarding compliance methods, pollution prevention, and accidental release prevention. Information must be available regarding alternative technologies and other ways of reducing air pollution.

The plan must also assure that small businesses receive notice of their rights under the Act in a manner and form that will allow them reasonably adequate time to evaluate proposed or final regulations and to evaluate methods of complying with them. While small businesses may obtain better information access through the assistance program, the limited resources of small businesses will be further stretched as their small staffs add permit and emission compliance responsibilities to their management responsibilities. As environmental requirements become more complicated and technology becomes more expensive, the price and variety of consumer goods is likely to be adversely affected by the resulting retreat of small businesses from regulated activities.

F. Other Provisions

1. Chemical Ban Provisions

Title VI of the Amendments is

entitled "Stratospheric Ozone Protection" and provides phase out schedules for chlorofluorocarbons ("CFCs"), carbon tetrachlorides and methyl chloroform. Title VI will restrict and then eliminate the use of aerosols and certain dry-cleaning and cooling chemicals¹²¹ and thus potentially increase the prices of products and services. These increased costs will result gradually as businesses are required to restrict current usage levels and meet regulatory emissions, recycling and disposal standards. Costs will also rise as businesses and industry must obtain and use more environmentally sound substitutes for the phased out chemicals.

The chemicals which will be phased out are divided into two classes. Class I chemicals are CFCs, halons, and carbon tetrachloride, which must be phased out by 2000, and methyl chloroform, which must be eliminated from use and production by 2002. Nonesential products releasing Class I chemicals must be banned by November 15, 1992. In 1994, aerosols and non-insulating foams using Class II chemicals not exempted on flammability or safety grounds will be banned. Restrictions on the Class II chemicals, hydrochlorofluorocarbons, take effect in 2015, and phase out will occur by 2030.¹²²

Limited exceptions to the phase out rules may be authorized consistent with the Montreal Protocol international ozone layer protection treaty on which these Amendment provisions are based.¹²³ EPA must also promulgate regulations to reduce use and emission of Class I chemicals to the lowest achievable level and establish standards for recapture, recycling and disposal of Class I and Class II chemicals.¹²⁴

Elimination of the targeted chemicals will reduce the risks of ozone depletion and create a market for safer substitute chemicals. Some of the substitutes which are being developed may not require modification of existing equipment,¹²⁵ thus reducing the conversion costs incurred by business and passed through to consumers of items and services as such air

conditioners, refrigerators and dry cleaning.

2. Enforcement

Title VII of the Amendments includes a number of provisions which enhance the enforcement authority of the federal government under the Clean Air Act. EPA is authorized to enforce state implementation plans when states fail to do so. EPA also has new authority to issue administrative penalty orders, and it is also empowered to issue subpoenas, file civil actions and initiate criminal proceedings through the United States Attorney General.¹²⁶

Criminal violations have been upgraded from misdemeanors to felonies, and the range of civil and criminal penalties for violations has been increased. Criminal penalties are provided for Clean Air Act violations which are committed with the violator's knowledge. The Amendments also add new criminal sanctions for recordkeeping, filing and other omissions which occur when the owner or operator of the regulated source has notice of those recordkeeping, filing or monitoring requirements.¹²⁷ "Operator" includes "senior management personnel or a corporate officer."¹²⁸ EPA may administratively assess penalties of up to \$25,000 per day per violation so long as the total penalty assessed does not exceed \$200,000. For minor violations, inspectors may issue on the spot "field citations" of as much as \$5000 per violation up to a total of \$25,000 during a six-month period.¹²⁹

These stringent enforcement provisions, particularly those providing for managers' criminal liability, will likely make managers of regulated businesses very sensitive to compliance issues. As a result, many small to medium size companies which have not previously devoted substantial worker hours and training to environmental compliance may hire full-time or part time environmental compliance personnel. Large corporations may augment their environmental staffs or train specific staff members as Clean Air Act specialists. Stricter environmental regulations

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such as the Amendments thus strengthen the environmental services sector of the economy and arguably reduce the overall impact of environmental regulation on the economy, including consumers of the economy's goods and services.¹³⁰

III. Conclusion

The Amendments have caused a national debate regarding whether achieving environmental goals produces benefits commensurate with the resulting increased costs for goods and services and the loss of jobs in affected industries. Lawmakers, business, and citizens groups have argued over the air toxics provisions, the acid rain program and other requirements to an extent probably not experienced since the first major federal environmental laws were enacted in the early 1970s. This results in part from the fact that the Amendments' effects are more obvious and direct than those of earlier laws, which did not clearly increase the cost of the most common consumer goods and services, such as automobiles, gasoline, electricity and dry cleaning. Further, none of these earlier laws were recognized during Congressional and public debate as a measure which would shut down an entire industry such as Midwestern coal mining.

Perhaps the most important lesson to be learned from the Amendments is that because no lawmaker wishes to be perceived as opposing environmental protection, Congress is likely to err on the side of additional protective environmental controls in reauthorizing major environmental laws. Significant new consumer costs may be expected to result from such environmental protection provisions. Whether this trend will be temporary or permanent will in large part depend on the ability of the United States economy to remain competitive in the international marketplace, absorb new environmental costs, and to offset those costs through the growth of a vigorous environmental sector which provides compliance equipment and services.

ENDNOTES

- 1 Pub. L. 101-549, 104 Stat. 2399 (1990). Hereinafter, all citations to the Amendments will refer to the appropriate sections of those Amendments (*e.g.*, Sec. 103).
- 2 42 U.S.C. § 7401-7601 (1988).
- 3 Pub. L. 95-95, 91 Stat. 685 (1977).
- 4 136 CONG. REC. S16,963 (daily ed. Oct. 27, 1990).
- 5 *Id.*
- 6 *Id.* at S16,888.
- 7 *Id.* at S16,967 - 16,968.
- 8 42 U.S.C. § 7409 (1988).
- 9 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 3 (Nov. 1990).
- 10 42 U.S.C. § 7502(c) (1988).
- 11 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 3 (Nov. 1990).
- 12 *Id.*
- 13 42 U.S.C. § 7409 (1988).
- 14 There are two types of national ambient air quality standards ("NAAQS") for each pollutant which EPA regulates under Title I. Primary standards are set at the level EPA deems necessary to protect the public health, and secondary standards are set at the level necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. The standards are set forth at 40 C.F.R. §§ 50.4 - 50.12 (1990). Reference methods for measuring the compliance with the standards are provided in the appendices to 40 C.F.R. Part 50 (1990).
- 15 Sec. 103. The referenced provision will be codified at Sec. 181(a) of the Act, 42 U.S.C. § 7511(a). EPA may grant up to two one-year extensions if the state which requests the extension has complied with its implementation plan and has had no more than one violation of the ozone standard during the year prior to the extension year.
- 16 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 6 (Nov. 1990).
- 17 Secs. 104 and 105. Sec. 104 will be codified at Secs. 186 - 187 of the Act, 42 U.S.C. §§ 7512-7512a. Sec. 105 will be codified at Secs. 188 - 190 of the Act, 42 U.S.C. § 7513 - 7512b.
- 18 *See supra*, note 11.
- 19 Sec. 103. For example, the general requirements for moderate areas will be codified at Sec. 182(b) of the Act, 42 U.S.C. § 7511a(b).
- 20 Sec. 103. For example, enhanced motor vehicle inspection and maintenance program requirements for serious areas will be codified at Sec. 182(c)(3) of the Act, 42 U.S.C. § 7511a(c)(3).
- 21 *See, e.g.*, 40 C.F.R. §§ 51.165(a)(iv), (v) (1990).
- 22 42 U.S.C. §§ 7410(a)(2)(I), 7502(a)(1) (1988).
- 23 42 U.S.C. § 7411(d), (f) (1988).
- 24 *See* Secs. 102(b), 103, and 301. The referenced provisions will be codified at Secs. 173(c), 182 and 112(a) of the Act, 42 U.S.C. §§ 7503(c), 7511(a) and 7412(a).
- 25 Sec. 502, which will be codified at Sec. 502 of the Act, 42 U.S.C. § 7661a.
- 26 The general requirements for nonattainment plans are set forth at Sec. 102(b) of the Amendments and will be codified at Sec. 172 of the Act, 42 U.S.C. § 7502.
- 27 *Coalition for Clean Air v. Environmental Protection Agency*, No. CV 88 4414 HLM (January 9, 1991, C.D. Cal.) (memorandum in support of motion to vacate agreement of partial settlement and order to dismiss complaint).
- 28 Sec. 102(c). The referenced provision will be codified at Secs. 110(m) and 110(n)(3) of the Act, 42 U.S.C. §§ 7410(m) and 7410(n)(3). *See also* 42 U.S.C. § 7410(a)(2)(I) (1989).
- 29 136 CONG. REC. S16,884 (daily ed. Oct. 27, 1990).
- 30 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 14 (Nov. 1990).
- 31 *Id.*
- 32 136 CONG. REC. S16,968 (daily ed. Oct. 27, 1990).
- 33 Sec. 204. The referenced provision will be codified at Sec. 202(j)(2) of the Act, 42 U.S.C. § 7521(j)(2). *See also* 136 CONG. REC. S16936 (daily ed. Oct. 27, 1990).
- 34 136 CONG. REC. S16,968 (daily ed. Oct. 27, 1990).
- 35 136 CONG. REC. H12,922 (daily ed. Oct. 26, 1990).
- 36 Sec. 203. The referenced provision will be codified at Sec. 202(i) of the Act, 42 U.S.C. § 7521(i).
- 37 Sec. 202. The referenced provision will be codified at Sec. 202(a)(6) of the Act, 42 U.S.C. § 7521(a)(6).
- 38 Sec. 207(a). The referenced provision will be codified at Sec. 202(m) of the Act, 42 U.S.C. § 7521(m).
- 39 Sec. 232. The referenced provision will be codified at Sec. 177 of the Act, 42 U.S.C. § 7507.
- 40 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 16 (Nov. 1990).
- 41 Sec. 209. The referenced provisions will be codified at Secs. 207(a)(1) and 207(b) of the Act, 42 U.S.C. §§ 7541(a)(1) and 7541(b).
- 42 Sec. 229. The fleet program provisions will be codified at Sec. 246 of the Act, 42 U.S.C. § 7586.
- 43 Sec. 229. The definition of "clean fuel vehicle" will be codified at Sec. 241(7) of the Act, 42 U.S.C. § 7581(7). "Clean alternative fuel" means any fuel, including methanol, ethanol or other alcohols, (including mixtures containing 85% or more by volume of those alcohols with gasoline or other fuels), reformulated gasoline, diesel, natural gas, liquefied petroleum gas and hydrogen, or a power source, including electricity, which when used in a clean fuel vehicle complies with the clean fuel vehicle program standards. *See* Sec. 229 of the Amendments. The referenced provision will be codified at Sec. 241(2) of the Act, 42 U.S.C. § 7581(2).
- 44 Sec. 229. The referenced provision will be codified at Sec. 246(c) of the Act, 42

- U.S.C. § 7586(c).
- 45 See 136 CONG. REC. S16,940 (daily ed. Oct. 27, 1990).
- 46 Sec. 219. The referenced provision will be codified at Sec. 246(b) of the Act, 42 U.S.C. § 7586(b).
- 47 Secs. 227(a)-(b). The referenced provisions will be codified at Secs. 219(a)-(b) of the Act, 42 U.S.C. §§ 7554(a)-(b).
- 48 Sec. 227(c). The referenced provision will be codified at Sec. 219(c) of the Act, 42 U.S.C. § 7554(c).
- 49 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 21 (Nov. 1990).
- 50 Sec. 227(d). The referenced provision will be codified at Sec. 219(d) of the Act, 42 U.S.C. § 7554(d).
- 51 See, e.g., 136 CONG. REC. S16,968 (daily ed. Oct. 27, 1990).
- 52 Sec. 222. The referenced provision will be codified at Secs. 213(a)(1)-(3) of the Act, 42 U.S.C. §§ 7547(a)(1)-(3).
- 53 Sec. 222. The referenced provision will be codified at Sec. 213(a)(5) of the Act, 42 U.S.C. § 7547(a)(5).
- 54 Sec. 219. The referenced provision will be codified at Sec. 211(k) of the Act, 42 U.S.C. § 7547(k).
- 55 Sec. 219. The referenced provision will be codified at Sec. 211(k)(3)(B)(1) of the Act, 42 U.S.C. § 7547(k)(3)(B)(1).
- 56 Sec. 219. The referenced provision will be codified at Secs. 211(k)(2) and 211(k)(3) of the Act, 42 U.S.C. § 7547(k)(2) and 7547(k)(3).
- 57 136 CONG. REC. S16,922 (daily ed. Oct. 27, 1990).
- 58 *Id.* at S16,965.
- 59 136 CONG. REC. H12,919 (daily ed. Oct. 26, 1990).
- 60 See *supra*, note 31, and accompanying text.
- 61 42 U.S.C. § 7412 (1988).
- 62 *Id.* at 7412(a)(1).
- 63 *Id.* at 7412(b).
- 64 *Id.* at 7412(b)(1)(B).
- 65 U.S. ENVIRONMENTAL PROTECTION AGENCY, THE CLEAN AIR ACT AMENDMENTS OF 1990 at 24 (Nov. 1990).
- 66 *Natural Resources Defense Council v. EPA*, 824 F.2d 1146 (D.C. § Cir. 1987).
- 67 *Lead Indus. Ass'n. v. EPA*, 647 F.2d 1130 (D.C. § Cir.), cert. denied, 449 U.S. 1042, 101 S.Ct. 621, 66 L.Ed.2d 503 (1980).
- 68 *Union Electric Co. v. EPA*, 427 U.S. 246, 96 S.Ct. 2518, 49 L.Ed.2d 474 (1976).
- 69 54 Fed. Reg. 38,044, 38,046 (1989).
- 70 54 Fed. Reg. 38,058 (1989).
- 71 Crandall argues that since a recent study estimates that the maximum number of annual cancers caused by large industrial sources is less than 500 and since no form of control can eliminate all exposures, the Amendments' air toxics provisions "are likely to reduce the annual number of cancers by far less than 500 per year." 136 CONG. REC. H12,923 (daily ed. Oct. 26, 1990).
- 72 Technology-based standards have been required for a number of years under the Federal Water Pollution Control Act, commonly known as the Clean Water Act, 33 U.S.C. §§ 1251 - 1387 (1988).
- 73 Sec. 301. The referenced provision will be codified at Sec. 112(b)(6) of the Act, 42 U.S.C. § 7412(b)(6).
- 74 Sec. 301. The referenced provision will be codified at Sec. 112(d) of the Act, 42 U.S.C. § 7412(d).
- 75 Sec. 301. The referenced provision will be codified at Sec. 112(d)(1)-(3) of the Act, 42 U.S.C. § 7412(d)(1)-(3).
- 76 Sec. 301. The referenced provision will be codified at Sec. 112(d)(4) of the Act, 42 U.S.C. § 7412(d)(4). See also 136 CONG. REC. S16,932 (daily ed. Oct. 27, 1990).
- 77 Sec. 301. The referenced provision will be codified at Sec. 112(a)(1) of the Act, 42 U.S.C. § 7412(a)(1).
- 78 42 U.S.C. § 7479(1) (1988).
- 79 Sec. 301. The referenced provision will be codified at Sec. 112(k) of the Act, 42 U.S.C. § 7412(k).
- 80 Sec. 301. The referenced provision will be codified at Sec. 112(e) of the Act, 42 U.S.C. § 7412(e).
- 81 Sec. 301. The referenced provision will be codified at Sec. 112(j) of the Act, 42 U.S.C. § 7412(j).
- 82 Sec. 301. The referenced provision will be codified at Sec. 112(i)(3) of the Act, 42 U.S.C. § 7412(i)(3).
- 83 Sec. 301. The referenced provision will be codified at Sec. 112(f) of the Act, 42 U.S.C. § 7412(f).
- 84 Sec. 303. The referenced provision will be codified at Sec. 112 of the Act (note), 42 U.S.C. § 7412 note.
- 85 136 CONG. REC. S16,932 (daily ed. Oct. 27, 1990).
- 86 Sec. 301. The referenced provision will be codified at Sec. 112(r) of the Act, 42 U.S.C. § 7412(r).
- 87 Sec. 304. The referenced provision will be codified in the Occupational Health and Safety Act, 29 U.S.C. § 655 note.
- 88 Sec. 301. The referenced provision will be codified at Sec. 112(r)(6) of the Act, 42 U.S.C. § 7412(r)(6).
- 89 U.S. ENVIRONMENTAL PROTECTION AGENCY DOCUMENTATION FOR DEVELOPING THE SOURCE CATEGORY LIST (draft report) (Dec. 14, 1990).
- 90 Sec. 401. The sulfur dioxide limitations will be codified at Secs. 404 - 406 of the Act, 42 U.S.C. § 7651c - 7651e. The nitrogen oxide program will be codified at Sec. 407 of the Act, 42 U.S.C. § 7651f.
- 91 Sec. 404, Table A.
- 92 See 136 CONG. REC. S16,880 (daily ed. Oct. 27, 1990).
- 93 Sec. 405(a)(2).
- 94 Sec. 404(a)(3).
- 95 *Id.*
- 96 136 CONG. REC. H12,917 (daily ed. Oct. 26, 1990).
- 97 *Id.* at H12,922 - 12,923 (Oct. 26, 1990).
- 98 136 CONG. REC. S16,880 - 16,881 (daily ed. Oct. 27, 1990); 136 CONG. REC. H12,919 (daily ed. Oct. 26, 1990).
- 99 *Id.* at H12,917.
- 100 136 CONG. REC. S16,968 (daily ed. Oct. 27, 1990).
- 101 *Id.* at S16,881.
- 102 136 CONG. REC. H12,919 (daily ed. Oct. 26, 1990).
- 103 136 CONG. REC. S16,893 (daily ed. Oct. 27, 1990).
- 104 *Id.*
- 105 Sec. 1101. Title XI of the Amendments will be codified at Sec. 326 of the Job Training Partnership Act, 29 U.S.C. § 1662e.
- 106 See 136 CONG. REC. S16,969 (daily ed. Oct. 27, 1990).
- 107 *Id.* at S16,893.
- 108 136 CONG. REC. H12,923 (daily ed. Oct. 26, 1990).
- 109 ILL. REV. STAT., ch. 111 1/2, para. 1009 (1989).
- 110 Sec. 502. The referenced provision will be codified at 502(a) of the Act, 42 U.S.C. §§ 7661a(a).
- 111 Sec. 502. The referenced provision will be codified at 502(b) of the Act, 42 U.S.C. § 7661a(b).
- 112 Sec. 502. The referenced provision will be codified at 502(d) of the Act, 42 U.S.C. § 7661a(d).
- 113 *Id.*
- 114 42 U.S.C. § 7509 (1988).
- 115 Sec. 502. The referenced provisions will be codified at §§ 502(b) and (d) of the Act, 42 U.S.C. §§ 7661a(b) and (d).
- 116 Sec. 506. The referenced provision will be codified at § 506 of the Act, 42 U.S.C. § 7661e.
- 117 Sec. 502. The referenced provision will be codified at § 502(b)(3) of the Act, 42 U.S.C. § 7661a(b)(3).
- 118 Sec. 505, which will be codified at § 505 of the Act, 42 U.S.C. § 7661d.
- 119 Sec. 504. The referenced provision will be codified at § 504(f) of the Act, 42 U.S.C. § 7661c(f). See also n.97, *supra*.
- 120 Sec. 507 will be codified at 42 U.S.C. § 7661f.
- 121 Secs. 601 - 618. Title VI of the Amendments will be codified at §§ 601 - 618 of the Act, 42 U.S.C. §§ 7671 - 7671q.
- 122 *Id.*
- 123 Secs. 614, 616. The referenced provision will be codified at §§ 614 and 616 of the Act, 42 U.S.C. §§ 7671m and 7671o.
- 124 Sec. 608. The referenced provision will be codified at 608 of the Act, 42 U.S.C. § 7671g.
- 125 136 CONG. REC. S16,965 - 16,966 (daily ed. Oct. 27, 1990).
- 126 127. Secs. 701, 703. The referenced provisions will be codified at §§ 113-114 and 307(a) of the Act, 42 U.S.C. §§ 7413-7414 and 7607(a).
- 127 Sec. 701. The referenced provision will be codified at 113(c) of the Act, 42 U.S.C. § 7413(c).
- 128 Sec. 701. The referenced provision will be codified at 113(h) of the Act, 42 U.S.C. § 7413(h).
- 129 Sec. 701. The referenced provisions will be codified at § 113(d)(1)-(3) of the Act, 42 U.S.C. § 7413(d)(1)-(3).
- 130 See, e.g., 136 CONG. REC. S16,969 (daily ed. Oct. 27, 1990).