



Report of the Office of Air and Radiation to Administrator William K. Reilly

Implementing the 1990 Clean Air Act: The First Two Years



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

NOV 12 1992

OFFICE OF
AIR AND RADIATION

Honorable William K. Reilly
Administrator
U.S. Environmental Protection Agency
Washington, D.C. 20460

Re: Two-year meeting

Dear Mr. Reilly:

Enclosed is my report to you summarizing our achievements over the last two years in carrying out the Clean Air Act Amendments of 1990.

The President signed the Clean Air Act Amendments in November 1990. In the two years since then, we have made tremendous progress in carrying out the Act's requirements. By November 1992, the Agency had proposed or finalized 76 rules that, once implemented, will accomplish more than 84 percent of the 57 billion pounds of annual emissions reductions mandated by the 1990 amendments.

Our efforts have been guided by a set of implementation principles we developed shortly after enactment of the 1990 amendments. We have sought to achieve and maintain a healthy environment while supporting strong and sustainable economic growth and sound energy policy. We have used consensus-building approaches -- such as regulatory negotiations, roundtable discussions and advisory committees -- to improve the quality of rules and guidelines and to expedite their issuance.

In addition, we have used market-based approaches and innovative strategies that give industries and states flexibility to achieve cleaner air in the most economically efficient ways. By embracing new approaches, we have been able to make substantially greater progress than otherwise would have been possible.

Standing back, I think we can look with pride at the Agency's recent accomplishments in pursuit of cleaner air. We have:

- o Put in place a ground-breaking, market-based acid rain control program to protect our lakes, streams and other resources through reductions in sulfur dioxide emissions.



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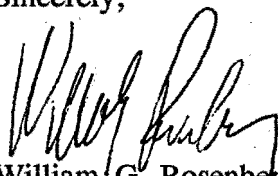
- o Issued a final rule to phase out chlorofluorocarbons and other chemicals that deplete the ozone layer.
- o Published extensive guidance to help states develop and implement plans for bringing urban air quality into line with federal standards by deadlines established in the Act.
- o Finalized or proposed 15 important rules or guidelines to reduce pollution from motor vehicles and fuels, and thereby reconcile the automobile and the environment.
- o Laid the foundation for cutting toxic emissions from all major pollution sources, and proposed standards for the chemical industry that will achieve greater emissions reductions than any other air toxics rule to be issued.
- o Initiated innovative, voluntary programs that are spurring industry and others to save energy and reduce emissions that contribute to global warming.

The attached report documents these and many other accomplishments of the Office of Air and Radiation since February 1989. The credit for these achievements must go first and foremost to the thousands of EPA employees who devoted their energies and intellects - and very often, extra hours -- to hundreds of rules, guidelines, studies, publications and other projects.

In recognition of this fact, the report includes a unique appendix listing the top accomplishments of each organizational unit of the Office of Air and Radiation. Also included are accomplishments of regional offices, the Office of General Counsel, and many other EPA offices that contributed to OAR efforts. These lists were developed by the employees themselves.

On behalf of OAR, I would like to thank you for guiding us through this critical period as we transform the promise of the new Clean Air Act into reality.

Sincerely,



William G. Rosenberg
Assistant Administrator
for Air & Radiation

Enclosure

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FOREWORD

*(As delivered by Assistant Administrator William G. Rosenberg
to the staff of the Office of Air and Radiation
U.S. Environmental Protection Agency
Durham, North Carolina
November 6, 1992)*

Soon four years will have come and gone -- somehow it seems more like four weeks -- and another chapter will be written in the history of the U.S. Environmental Protection Agency. In a mere twenty years, EPA has come to occupy a prominent place in the American landscape. The Agency's many contributions to the health and welfare of all U.S. citizens, and to the quality of American life, have placed us in the forefront of institutions that serve the public good.

The last four years are certain to be remembered among our finest hours. Under Bill Reilly's stewardship, EPA has broken every record for aggressive environmental rulemaking and strong enforcement. As important, we have broken new ground with market-based and voluntary clean air initiatives -- ingeniously designed programs that achieve our environmental goals in concert with forces that insure a healthy economy.

In the Office of Air and Radiation, I have been fortunate to have had the opportunity to oversee the development, enactment and implementation of the Clean Air Act of 1990. I am very pleased to report, since the Act became law two years ago this month, that EPA has proposed or finalized rules that will accomplish 84 percent of the 57 billion pounds of air pollution reductions mandated by Congress.

We could not have achieved this record without Bill Reilly's active leadership and his direct involvement in our efforts. At critical junctures, he kept our clean air fleet on course and at full throttle by

- ◆ Negotiating a declining cap for sulfur dioxide emissions under the Acid Rain Program
- ◆ Defending the alternative fuels program in the face of controversy on all sides
- ◆ Supporting the soundness of EPA's legal and technical analysis

- ◆ Insisting upon unbiased, technology-forcing monitoring equipment to make the Allowance Trading System work
- ◆ Resolving the ethanol dispute without compromising environmental goals
- ◆ Insuring that Inspection and Maintenance Testing would be an "honest count"
- ◆ Supporting the Air Program with significant budget increases

Putting these sweeping new laws in place has been a tremendously challenging and extremely satisfying experience. For me it began in January of 1989, in the midst of the Congressional debate over clean air policy, a conflict that had raged for over a decade with little progress and scant hope for resolution.

It was President Bush who finally broke the deadlock by supporting EPA's recommendations and proposing a measure that promised to both clean the air and promote a healthy economy. Without the President's initiative, and without his continued commitment, this landmark clean air legislation would never have had a breath of a chance.

When he submitted his bill to Congress, the President said, "Every American deserves to breathe clean air." At the White House, on November 15, 1990, as he signed this bill into law, the President reaffirmed his commitment, calling the Clean Air Act of 1990 "the most significant air pollution legislation in our nation's history."

Nor would there be a Clean Air Act without the leaders in the U.S. Congress: Senators Mitchell, Baucus, Chafee, Dole and Simpson, and Congressmen Dingell, Waxman and Lent -- not to mention their excellent staffs, who rarely get the credit they deserve.

The Clean Air Bill passed in the Senate by a vote of 89-11, and in the House by a vote of 401-25. These numbers represent an overwhelming mandate from the American public, and they establish a clear national agenda for the 1990s.

Perhaps most remarkably, the Clean Air Act reflected the needs and interests of both American industry and the environmental community. Both played a critical role in shaping these laws, and both have been indispensable to EPA's successful clean air implementation. In the past two years, industry leaders

and environmentalists have advised EPA -- in an unparalleled collaborative process -- in the writing of new clean air regulations. In the process, they have shown a willingness to compromise and, increasingly, to work with -- if not trust -- each other.

Not only representatives of industry and environmental groups but also state and local government and public health officials, labor, consumer and academic leaders, and many other stakeholders have actively participated in EPA's negotiated rulemaking process. No interested party has been excluded, and no constituency has gone unheard. This consensus-building process has enabled us to establish enforceable clean air standards, while accommodating the business plans of the most progressive companies and leveling the playing field for their competitors.

Emerging from this remarkably successful consensus process are innovative measures like the Acid Rain Rule with its market-based Allowance Trading System, the Navajo Agreement to clean up the Grand Canyon, a coke oven air toxics rule, resolving 25 years of litigation, consent orders and grand jury investigations, and an historic regulatory negotiation that produced the Reformulated Gasoline and Oxygenated Fuels program. These measures are producing environmental reforms that clean the air and allow the marketplace to function effectively at the lowest cost to businesses and consumers. Market-based approaches enable us to achieve the greatest possible emissions reductions at a price Americans are willing to pay.

Many of our clean air programs are also helping us to conserve our precious energy resources and save billions of dollars in energy costs. Clean Air Act initiatives will save the U.S. economy an estimated one million barrels of oil per day by causing shifts to natural gas and clean coal for electric generation and the substitution of natural gas-based methanol and corn-based ethanol for some of today's gasoline products. Voluntary energy conservation programs, like EPA's Green Lights, are already cutting carbon dioxide emissions by two million tons annually and will save as much as \$20 billion per year in energy costs by the end of the decade.

Speaking of costs, the President's Council of Economic Advisors originally estimated that these clean air measures, when fully implemented, would cost the American economy \$25 billion annually. That comes out to 25 cents per day per person, a bargain by any measure for the environmental benefits derived. But our clean air programs will also provide economic benefits. A study recently conducted for EPA by the investment firm of Smith Barney projects new revenues

for the air pollution control industry of \$50 billion to \$70 billion by the year 2000 and, in the same period, the creation of 20,000 to 40,000 new jobs.

Highlights of our clean air accomplishments in the first two years of implementation include the following:

The Acid Rain Rule

Finalized on October 26, 1992, the Acid Rain Rule will cut emissions of sulfur dioxide -- a major contributor to acid rain -- by fifty percent. Control of acid rain will help restore the fish to hundreds of lakes and streams. You will see farther in the daytime, and see more stars at night. Thousands of acres of forests that have been damaged will begin to recover. Historic buildings and monuments will age more slowly -- and acidic particles that may threaten health will be sharply reduced.

The Acid Rain Rule was the product of our Acid Rain Advisory Committee -- a very diverse group representing utilities, state utility and environmental regulators, environmental and consumer groups, the coal and gas industry, pollution control manufacturers, and other interested parties.

The Allowance Trading System

Allowance Trading is an imaginative, market-based approach for reducing SO₂ emissions. Electric utilities are given a specific number of emission allowances based on historical data. One allowance gives its holder the authority to emit one ton of sulfur dioxide. A utility that cuts its SO₂ emissions below its required level can sell what's left over to another utility at the market price.

Allowance Trading rewards utilities that exceed the tight new requirements of the Act by allowing them to profit from the sale of emission credits -- and allows utilities that buy these credits some added leeway to install new technology or implement conservation measures. Meanwhile, electric utility emissions will be cut in half. The Chicago Board of Trade plans to create a market for these emissions credits. What could be more enterprising, more market-based, than the trading of emissions futures right alongside soybeans and pork bellies!

The Navajo Agreement

On September 18, 1991, the President announced an historic agreement that will reduce -- by 90 percent -- the sulfur dioxide emissions from the Navajo Generating Station. For years, pollution from the Navajo power plant has

impaired visibility and obscured the magnificent vistas of the Grand Canyon. But amidst conflicting claims and protracted litigation, nothing was accomplished for nearly twenty years. But we were able to forge a compromise without litigation in a way that served the environment and the public interest -- and in a form that all parties could live with.

Reformulated Gasoline and Oxygenated Fuels

On August 16, 1991, EPA announced a negotiated regulatory agreement on reformulated gasoline and oxygenated fuels, rules that will counteract the two major causes of air pollution in the U.S. -- automotive tailpipe emissions and evaporating fuel.

In the process, we brought to the table a group of historic rivals: the oil industry, automobile industry, ethanol, methanol and other oxygenated fuels industries, environmental groups, gasoline marketers, and local, state and federal government agencies. Together, we negotiated the details of a reformulated gas and oxygenated fuels agreement. The use of reformulated gasoline -- by itself -- will reduce toxic pollutants nationwide by 15 percent. As NRDC's David Doniger said later, "We wanted cleaner gas and they wanted certainty and flexibility." Through the dynamics and the give and take of the Reg-Neg process, we were able to satisfy both sides and meet our clean air goals.

And The Week That Was

In 1992, we have kept up our rapid implementation pace. In a ten-day period, beginning in the last week of October, EPA announced ten major clean air rules, including finalized core rules of the Acid Rain program and two proposed rules to reduce nitrogen dioxide, another major contributor to acid rain. For the first time, utilities and other stationary NO_x sources will cut NO_x emissions by as much as 2 1/2 million tons annually by the year 2000.

We also announced an agreement to reduce coke oven emissions, among the most toxic of all air pollutants. This agreement -- a product of another successful regulatory negotiation with the steel industry and unions -- will help preserve jobs and minimize cost impacts on the steel industry, while protecting citizens in surrounding areas from air pollution. This pact exceeds -- in every case -- the environmental goals of the new Clean Air Act, and it will cost less than 10 percent of what the steel industry fearfully predicted during the Congressional debate.

We proposed the first air toxics rule for the chemical industry under the new Clean Air Act. The Hazardous Organic NESHAP (HON) rule will reduce emissions of 110 of the 189 toxics on the inventory list, and will regulate production of 400 chemical substances produced by synthetic organic chemical manufacturers. This proposed rule, also developed through a public participation process, will reduce hazardous air pollutants by 1 billion pounds and volatile organic compounds by 2.4 billion pounds each year.

High Tech Inspection and Maintenance

On November 5, 1992, EPA finalized its high-tech auto inspection and maintenance program. High-tech I&M will do more to reduce air pollution nationwide than any other single measure. Improved auto testing in the most polluted areas will keep cars properly tuned. More sophisticated equipment will test the operation of cars "under load," and the separation of testing and repair will insure the reliability of test results. The rule also insures that these 10-minute emissions checks will be conducted at conveniently located test stations.

Today, an estimated 20 percent of all vehicles on the road are creating more than 60 percent of the auto-related air pollution -- which is half of the overall air pollution we suffer. \$50 billion has already been invested in automotive pollution control technology. If motorists repair their faulty emissions equipment - - often something as simple as fixing a broken hose -- we can cut vehicle VOC emissions by 28 percent, CO by 31 percent, and NO_x by 9 percent -- a tremendous environmental gain at a very modest cost.

The Green Programs

Voluntary initiatives are at the heart of our clean air program and are essential to our ultimate success. I am happy to say that our Green Programs, which promote energy efficiency and pollution prevention, so far have been stunningly successful. The Green Lights Program, which cuts air pollution and saves energy through energy efficient lighting, has been the single most successful initiative in our entire implementation process. To date, over 650 companies, state and local governments, and universities have joined the Green Lights program. It's an impressive list that includes ARCO, Lockheed, Pacific Gas and Electric, Hewlett-Packard, Gillette, Mobil, 3M, Polaroid, Xerox, Citicorp, M.I.T., and the States of California and Massachusetts, just to name a few.

Green Lights is the centerpiece of the President's action plan on global climate change. Also prominent on this agenda are two other EPA energy efficiency programs: Golden Carrot, which will market a refrigerator/freezer that

uses less electricity and no CFCs; and EPA Energy Star Computers, developed in cooperation with industry leaders, including IBM, Apple, Compaq, Hewlett-Packard, NCR, and DEC. Energy Star's industry partners have agreed to manufacture and market energy-efficient computer equipment that shuts off automatically when not in use -- utilizing 30 watts instead of 200 watts of electricity -- and saving energy equivalent to the output of 20 power plants by the end of the decade.

Permits

On July 21, 1992, EPA issued an operating permits rule that carries out a major reform of the 1990 Amendments. State permit programs will be the centerpiece for compliance with the entire Act. The permit system is designed to improve compliance with the law's requirements and provide more certainty to companies about their obligations.

Most important, as a result of these actions, the air is getting cleaner.

Look at the results of the Air Trends Report, released last month. It shows continuing progress in reducing six major air pollutants over the past ten years. The new air quality data for 1991 reveals that

- ◆ 41 of the 98 areas designated under the 1990 Act as "non-attainment" for ground level ozone (smog) now meet the national air quality standard for ozone.
- ◆ 13 of the 42 areas designated nonattainment for carbon monoxide now meet the standard.

These one-year improvements are due to emission reductions, weather variations, and other factors.

In the past ten years, we have managed to significantly reduce the ambient levels of these six major pollutants:

- ◆ Smog levels have dropped eight percent.
- ◆ Lead levels have been cut by a dramatic 89 percent.
- ◆ Sulfur dioxide pollution has been reduced by 20 percent.
- ◆ Carbon monoxide levels have declined by 30 percent.

- ◆ Particulate levels are down 10 percent.
- ◆ Nitrogen dioxide pollution has been reduced by six percent.

These air quality improvements translate into health benefits for all U.S. citizens. It's a real American success story. And the Clean Air Act will assure that it is a continuing and even greater success story.

Of course, much remains to be done. In 1991, 86 million Americans lived in areas with unhealthy air. Nearly 70 million people live in counties exceeding the smog standard. But as the Clean Air Act becomes an increasing reality at the state and local level, the air is getting cleaner. As the Trends Report shows, we are dramatically reducing auto emissions that befoul our cities with smog, carbon monoxide, and particulates. New Clean Air Act rules will enable you to drive behind a city bus -- and not have to choke on the black smoke belching from its tailpipe.

Forests, lakes, and streams are getting cleaner. To cut acid rain, electric utilities are improving power plants to reduce sulfur dioxide and nitrogen oxide emissions that cause acid rain by 10 million tons nationwide -- that's 10 million tons each year.

We are cutting toxic smokestack emissions from refineries, power plants, chemical plants -- even dry cleaners. In communities across the country, we are clearing the air of leaks from steel and chemical plants that can cause cancer and threaten our respiratory systems.

Cars are getting cleaner -- 50 percent cleaner. Next fall, in response to the Clean Air Act, new cars rolling off assembly lines in Flint, Dearborn, and Sterling Heights will be 50 percent less polluting than today's models.

Gasoline is getting cleaner. On November 1, 1992, oxygenated fuel programs in 39 cities began cutting carbon monoxide emissions by 17 percent, increasing the use of ethanol from Midwest grain and methanol from Southwest natural gas -- both replacing imported oil from the Middle East. In 1995, reformulated gasoline will be available that adds oxygen, cuts benzene toxics and lowers volatility that causes fumes to evaporate. The net result of reformulated gasoline will be to reduce smog-causing, toxic pollutants by 15 percent in 1995, and up to 25 percent in the year 2000, in our nation's dirtiest cities.

Gasoline stations are getting cleaner. Stage Two gas pump controls will reduce exposure to toxic gasoline vapors and save fuel that would otherwise be wasted through evaporation.

The atmosphere is getting safer. CFCs, which destroy the earth's protective shield and threaten our health, are on the way out. Under the new Act, President Bush has accelerated the international timetable under the Montreal Protocol to phase out CFCs more quickly in the United States and halt production entirely by the end of 1995. And as of August, 1992, service stations must recycle freon when repairing auto air conditioners.

As a direct result of these actions, Americans are benefitting, and will benefit for generations to come. Emphysema sufferers in Chicago, heart patients in Los Angeles, asthma-sufferers in Washington, D.C., especially children and the elderly, will all be less at risk when they step outdoors. Millions of Americans will experience more sunny, smog-free, summer afternoons and clear, starry nights.

Four years ago, market-based programs, voluntary initiatives, consensus-rule making, and least-cost solutions were mainly concepts, phrases we attached to clean air ideas and drawing-board plans we hoped would work in the real world. Today, four years later, all of these ideas are being realized. Well conceived and expertly executed, these plans are working. And our hopes are coming to fruition.

In the months ahead, our clean air efforts will continue apace at the federal level, as we continue to implement statutory clean air requirements, work to resolve other NO_x issues, improve our residual risk procedures and data on inventories, encourage the development of new technologies and cleaner cars, and develop new forums for full participation in the clean air process. We will also redouble our efforts to assist state and local governments in their efforts to make these clean air programs a reality in every city, town and neighborhood from coast to coast.

Finally, the President, the Congress, environmental groups, industry, state and local governments -- all of our "clean air partners" -- deserve great credit for our successes to date. But the greatest share of credit, and the highest praise, rightly belongs to our own EPA staff. Without your knowledge, skill, and remarkable dedication, the Clean Air Act of 1990 would still be a blueprint.

I have had the great good fortune to work hand in hand -- and often far into the night -- with the staff of the Office of Air and Radiation and other EPA offices. On a thousand occasions, you have patiently explained to me the subtleties and nuances of highly sophisticated clean air measures. You have

briefed me, educated me, argued with me and sometimes cursed at me. From Durham to Ann Arbor to Waterside Mall -- in every regional office, and at every level from secretary to office director -- you have given me your tremendous support. But more important, more than anyone, you have made this clean air law work for all of us and for future generations of Americans.

* * * * *

Following the report to the Administrator on the succeeding pages is an informal record, a memoir in your own words, of our many shared accomplishments during the past four years. It is a record we can all be very proud of. You are quite simply the finest group of public servants I have ever encountered, and it has been my privilege to share your company during this exciting time in our lives. Thank you for your amazingly hard work, for the hard-won victories, for the many good times, and for your friendship.

CHAPTER 1

IMPLEMENTING THE ACT: THE BIG PICTURE

President Bush on November 15, 1990 signed into law a massive overhaul of the Clean Air Act that is designed to provide cleaner air for all Americans.

Major goals of the Clean Air Act Amendments of 1990 are

- ◆ to bring urban air quality into line with health-based air quality standards by deadlines set in the Act
- ◆ to reduce emissions of air toxics by at least 75 percent
- ◆ to cut emissions of sulfur dioxide, a primary contributor to acid rain, by 10 million tons
- ◆ to phase out production of chlorofluorocarbons and other chemicals that deplete the stratospheric ozone layer
- ◆ to require cleaner cars, fuels, factories, power plants and businesses

In the two years since enactment, the Environmental Protection Agency has made great strides in implementing the landmark legislation. By the end of October 1992, the Agency had proposed or finalized 76 rules to carry out the law. Once implemented, these rules and guidelines will accomplish more than 84 percent of the 57 billion pounds of annual emissions reductions mandated by the 1990 Amendments.

Past Progress Cleaning the Air

The 1990 Amendments were passed to continue the progress toward cleaner air begun under the Clean Air Act of 1970 and the Clean Air Act Amendments of 1977.

Between 1970 and 1991, lead emissions plunged 98 percent. Emissions of particulate matter (soot, dust and other particles) dropped 61 percent, carbon monoxide 50 percent, and sulfur oxides 27 percent. Volatile organic compounds and nitrogen oxides, which combine in the atmosphere to form ozone, declined 38 percent and 1 percent respectively.

But serious air pollution problems persist. About 86 million Americans live in counties where air pollution levels measured in 1991 exceeded the national air quality standard for at least one of six major pollutants. Ground-level ozone, the prime ingredient of smog, is the most widespread and intractable of these pollution problems. Acid rain and toxic air pollution, also major problems, were not effectively controlled under the 1970 or 1977 Acts.

The 1990 Act

The new Clean Air Act is an effective and cost-effective plan for tackling these difficult problems. The law mandates pollution reductions while giving states and industry much flexibility on ways to achieve clean air goals.

Increased emphasis on innovative, market-based regulatory approaches is an important feature of the new law. The acid rain control program, for example, allows electric utilities to buy and sell emissions credits. These approaches provide industries with flexibility to reduce pollution in the least costly ways.

The 1990 Act provides new tools for bringing urban pollution levels into line with federal air quality standards. Cities violating air quality standards are given different deadlines for attainment

depending upon the severity of the pollution. Areas with longer deadlines must implement more control measures and demonstrate interim progress toward reaching the standard.

In addition, the Act establishes a four-pronged approach for reducing motor vehicle pollution -- tighter emissions standards for new vehicles, cleaner fuels, improved vehicle inspection and maintenance programs, and clean transportation alternatives. These programs are designed to reconcile the automobile with the environment.

Toxic air pollution from industrial plants is to be reduced through a two-phased program. EPA must set best control technology standards for all major sources of air toxics within a 10-year period. If significant risks remain after control technology is installed, the Agency must set tighter standards to protect public health.

The 1990 Act also takes aim at two atmospheric problems that have come into focus during the past decade: acid rain and stratospheric ozone depletion. The acid rain control program is designed to reduce annual U.S. emissions of sulfur dioxide by 10 million tons, mostly from electric power plants. To protect the ozone layer, the Act mandates a phaseout of ozone-depleting chemicals and the establishment of requirements for use, recycling and disposal.

To facilitate enforcement, the 1990 Act requires industrial plants and businesses classed as major pollution sources to obtain operating permits from state or local air agencies. The money

needed to administer permit programs will be raised through permit fees.

Although complying with the Act will be costly for many industries and businesses, the new law also is creating business opportunities and economic benefits. For example, tens of thousands of workers will be needed for the manufacture of air pollution control equipment for factories and businesses. Investments spurred by the Act are positioning American businesses to compete worldwide in areas such as alternative-fueled vehicles, cleaner fuels, more efficient manufacturing processes, and pollution control equipment.

Implementation Principles

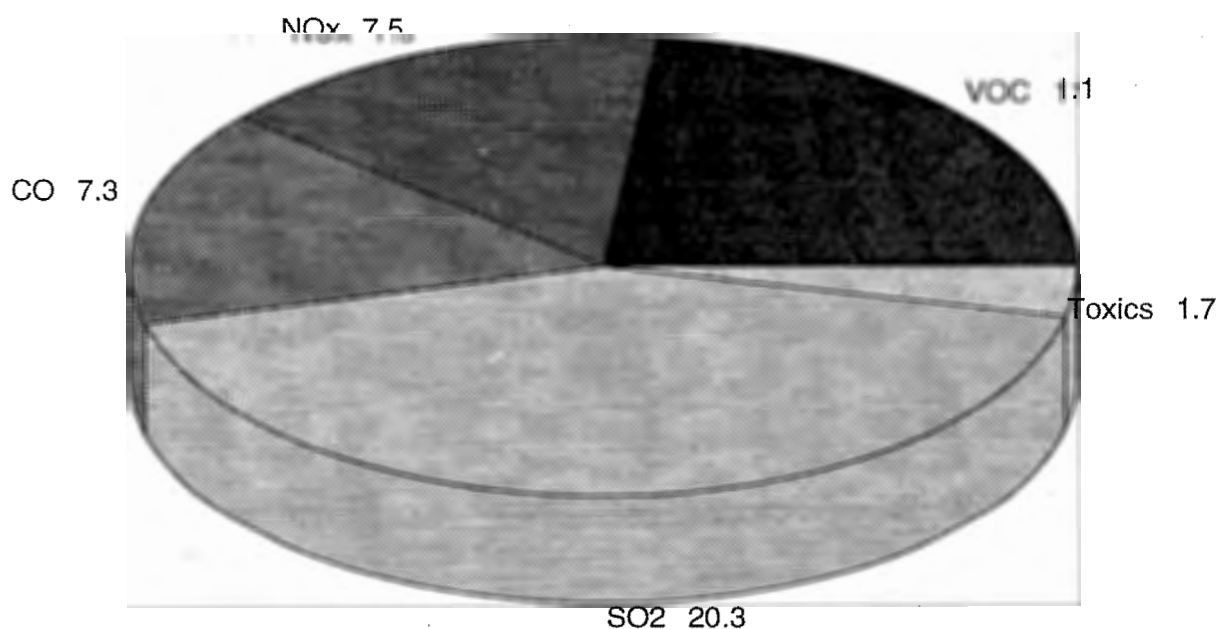
Implementation of the 1990 Act poses a tremendous challenge for the Agency. As President Bush stated, "Every American expects and deserves to breathe clean air." To expedite and guide this work, the Office of Air and Radiation adopted the following set of implementation principles shortly after enactment of the 1990 Amendments.

Policy

- ◆ **E³:** Achieve and maintain a healthy *environment* while supporting strong and sustainable *economic* growth and sound *energy* policy.
- ◆ **Market-based strategies:** Use market-based approaches and other innovative strategies to solve environmental problems creatively.

Reductions Expected from Rules Proposed or Promulgated as of November 9, 1992

(In Billions of Pounds per year)



Total Reductions: 47.9

Reductions Expected from Specific Rules Proposed or Promulgated as of November 9, 1992

(In Billions of Pounds per year)

VOC	
Phase II RVP Rule	2.6
Reformulated Gasoline Rule	0.3
Onboard Diagnostics Rule	0.3
Evaporative Controls Rule	1.7
Tier I Tailpipe Rule	0.3
Enhanced I&M Rule	5.6
Equipment Leaks Rule	0.3
Total	11.1
NOx	
Title IV NOx Rule	4.0
Title I NOx Guidance	1.0
1998 Heavy-Duty Engine Rule	0.5
OnBoard Diagnostics Rule	0.3
Tier I Tailpipe Rule	1.7
Total	7.5
CO	
Oxygenated Fuels Rule	3.7
Onboard Diagnostics Rule	2.4
Diesel Fuel Quality Rule	0.4
Enhanced I&M Rule	0.8
Total	7.3
SO2	
Acid Rain Rule	20.0
Diesel Fuel Quality Rule	0.3
Total	20.3
Toxics	
Hazardous Organics (HON)	1.0
Municipal Waste Combusters	0.5
Early Reductions Rule	0.2
Total	1.7

Total Reductions: 47.9

Does not include rules that reduce emissions less than 50 million pounds.

Consensus Building

- ◆ **Joint ventures:** Recognize the essential role played by state and local governments. Foster communication and cooperation among all entities involved in implementing the Amendments.
- ◆ **Negotiation:** Use negotiation techniques to resolve critical issues with other interested parties, including other government organizations, industry, environmental groups, and academics.
- ◆ **Federal coordination:** Work closely with EPA Offices, other federal agencies, and the Congress to ensure a coordinated approach that will achieve environmental objectives as effectively as possible.

Management

- ◆ **Deadlines:** Establish and meet commitments to effectively implement key provisions of the Act.
- ◆ **Team effort:** Work together, and attract and retain a diverse and talented work force.

The new law requires EPA to issue more than 120 regulations by 1995, an average of 24 rules per year. In the two years since enactment, the Agency has issued 76 proposed air rules, of which 23 have been finalized. Historically, the air office has issued five to eight major rules per year.

Although its actions have been significant, EPA has not met all of the

Act's deadlines. In a number of cases, regulations have been proposed for comment but not yet completed. In addition, as of November 15, 1992, EPA has submitted 11 proposed rules and 4 final rules to the Office of Management and Budget and is awaiting review. The Agency is now in the final stages of negotiating a comprehensive court-approved schedule for further regulatory action.

The Agency has found implementing the 1990 Amendments even more challenging than it anticipated. Reaching the degree of consensus necessary to issue the rules and to lay the groundwork for effective implementation has proven to be a lengthy process.

Achievements to Date

This report is designed to provide a broad picture of EPA's actions to date implementing the Act. Some of the highlights include the following:

Acid rain control. Core regulations for a market-based acid rain control program will protect lakes, streams and other resources through a 50-percent cut in electric utility emissions of sulfur dioxide.

Ozone layer protection. Phase-out requirements have been put in place for chlorofluorocarbons and other chemicals that deplete the stratospheric ozone layer.

State air quality planning. Extensive EPA guidance will help states develop and implement plans for bringing air quality into line with federal standards by deadlines established in the Act.

Cleaner gasoline. National limits on gasoline's volatility -- its tendency to evaporate -- already are dramatically reducing the release of ozone-forming hydrocarbons and air toxics. Under a proposed rule, a new generation of cleaner, "reformulated" gasolines will be required in the nine cities with the worst ozone pollution starting in 1995. Twelve states have opted to extend the program to additional cities. Since November 1, 1992, millions of motorists have been pumping cleaner, "oxygenated" gasoline into cars in 39 cities with carbon monoxide pollution; this fuel will reduce CO tailpipe emissions by 17 percent.

Cleaner cars and trucks. Tighter emissions limits for cars and light trucks will be phased in starting with 1994 models, cutting exhaust hydrocarbons by 30 percent and nitrogen oxides by 60 percent relative to current standards. A new cold-temperature standard will reduce wintertime carbon monoxide emissions. Black smoke from diesel trucks and buses will be dramatically cut by tough new particulate standards and by new limits on sulfur in diesel fuel.

Vehicle inspection and maintenance. Improved, high-tech vehicle emissions inspection programs must be implemented in 1995 in cities with serious ozone or carbon monoxide pollution. Basic inspection and maintenance (I&M) programs will be required in additional areas of the country. These programs ensure that cars are tuned up and that their emissions systems are working properly.

Fleet vehicles. In 22 cities, 50- to 70-percent of certain new fleet vehicles -- such as taxis and delivery vans -- will have

to meet tailpipe standards more stringent than those for conventional vehicles, beginning in 1998. EPA guidelines will provide incentives for purchase of ultra-clean vehicles fueled with natural gas, propane, pure alcohol or electricity.

Industry air toxics. An innovative "early reductions" program already is giving industries an incentive to reduce toxic air pollution earlier than required by the Act. Proposed standards would cut toxic emissions from synthetic organic chemical manufacturing by 522,500 tons per year -- more than any other air toxics standard to be issued under the 1990 Amendments.

Permits. A final rule establishes the minimum requirements for state and local operating permit programs. These programs will ensure better compliance with the Act and raise more than \$300 million annually for state and local air pollution control agencies.

Offshore oil facilities. Oil and gas platforms in the ocean off most of the U.S. coast will be subject to the same air pollution control requirements as onshore facilities.

Incinerators and landfills. Municipal waste incinerators must achieve a 90-percent overall reduction in emissions of metals, organic chemicals and acid gases. Proposed standards for large solid waste landfills and 2,300 hazardous waste treatment, storage and disposal facilities would cut smog-forming and toxic air emissions -- as well as releases of methane, a greenhouse gas.

As EPA turns out rules and guidelines establishing the framework for

implementation, the challenge of cleaning the air moves to the states. EPA already is working intensively with states to see that clean air goals are met.

Clean Air Act Costs

EPA and the President's Council of Economic Advisors originally estimated that the cost of the 1990 Amendments would eventually reach \$25 billion per year when fully implemented in 2005 -- about 25 cents a day for each person living in the United States.

Now, EPA projects the annual cost to be at least \$2 billion lower than the original estimates for years after 2000, with even greater savings in earlier years. The savings result from fine-tuning of cost estimates and from regulations that use market-based or other flexible approaches. Consider the following examples:

- ◆ **Reformulated gasoline.** More detailed analysis puts the cost of reformulated gasoline at 4.3 cents per gallon, versus the original estimate of 6.2 cents. Also, the oxygen standard is 2 percent rather than 2.7 percent, the level originally analyzed. Total savings will be \$700 million in 1995, and \$400 million per year by 2005.
- ◆ **Coke ovens.** According to *The Wall Street Journal* (October 26, 1992), industry estimates of the costs of cutting toxic air pollution from steel industry coke ovens ranged as high as \$3 billion to \$5 billion during Congressional debate over the 1990 Amendments. An agreement reached through regulatory negotiation envisions capital costs of \$66 million

to \$510 million, depending on the technology the plants choose, with corresponding annual operating costs of \$25 million to \$84 million. The dramatically lower cost of the agreement reflects the more realistic cost estimates that can result from regulatory negotiation. In addition, some savings are expected from the negotiated use of emissions averaging.

- ◆ **CTGs.** More detailed analysis shows that control technology guidelines (CTGs) will achieve more than twice the emissions reductions at the same cost originally projected, reducing the need for more costly control measures in areas with dirty air. Preliminary estimates show net cost savings from avoiding more expensive measures could reach \$1 billion per year when the program is fully in place, relative to the original estimate.
- ◆ **Air toxics.** EPA believes that the use of emissions averaging to comply with toxic air pollution standards could reduce compliance costs significantly.

Cost estimates have increased for some rules, including the trip reduction planning rule and the permits rule. However, the net result of the increases and decreases is a significant drop in the Act's estimated cost.

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CHAPTER 2

USING THE MARKET TO SERVE THE ENVIRONMENT: FREE MARKET ECONOMICS AND CLEAN AIR

EPA often has been accused of issuing inflexible command-and-control regulations that can become outdated because they require use of a particular pollution control technology. In response, the Agency increasingly has moved to performance standards that set a minimum control level -- for example, a 70-percent reduction in air pollutant emissions. This approach gives industry flexibility to decide the best way to achieve that level, considering cost and other factors.

During the 1980s, EPA structured a number of air pollution programs to provide even more flexibility by allowing a company to comply with performance standards through averaging emissions from multiple emissions points, such as smokestacks. A few programs were designed to enable companies that go beyond minimum requirements to trade or sell credits to other companies that do less than required. For example, refiners were allowed to trade credits under EPA rules requiring a phased reduction of lead in gasoline. These rules cut lead emissions from motor vehicles by more than 96 percent between 1982 and 1991.

Today, under the 1990 Amendments to the Clean Air Act, EPA is accelerating the movement toward flexible rules that allow industry to reduce air pollution in the most economical way and encourage technology innovation. But the Agency is trying to couple flexibility with accountability -- through adequate monitoring and enforcement -- to ensure that clean air goals are met.

Controlling Acid Rain

A prime example is the acid rain control program, which is based upon an innovative system of marketable pollution allowances. Each electric utility plant is allocated a limited number of emission allowances. One allowance entitles the holder to emit one ton of sulfur dioxide. A utility that cuts its SO₂ emissions more than required can sell its extra allowances to another utility at the market price, or bank them for future use.

The Act's tough requirements are designed to achieve a 10-million-ton reduction in annual sulfur dioxide emissions from the 1980 level, mostly through a 50-percent cut in electric utility emissions. The allowance system provides flexibility for emissions reductions to be achieved at the plants where controls are least expensive, reducing costs to utilities and electricity consumers.

The system rewards utilities that go beyond the Act's stringent control requirements by enabling them to earn profits from the sale of their extra allowances. Utilities that find controls less cost effective can purchase allowances to meet all or part of their control requirements. The buyers essentially are paying for their required emissions reductions to be achieved by other utilities that can reduce emissions more economically.

Exploring Other Market-Based Approaches

EPA is developing a number of other programs with market features to minimize the cost of cleaning the air.

A rule being developed by EPA will encourage states to adopt economic incentive programs to reduce pollution using such methods as marketable permits and emissions fees. Under the 1990 Amendments, these programs are optional for most cities but may be mandated in cities with serious ozone problems that fail to meet deadlines for reducing pollution. The proposed rule may be issued as early as December 1992.

One option for states outlined in the draft economic incentive proposal is a program to allow industries emissions credits for buying alternative-fueled vehicles or taking other steps that go beyond the new Act's requirements for motor vehicle emissions reductions. These credits could be used toward compliance with smokestack emission limits. Goals include stimulating development of new technologies and creating incentives for use of natural gas vehicles.

EPA has supplied major assistance to California for a local initiative called the Regional Clean Air Incentives Market, now under development. RECLAIM is intended to use economic incentives for smog and particulate control and create separate markets for authorizations to emit three pollutants: hydrocarbons, nitrogen oxides and sulfur oxides.

EPA also is working on detailed guidance for states to implement "cash for

clunkers" programs offering industry credits for taking high-polluting cars off the road - by buying and scrapping them, for example. In Los Angeles, spending \$1,000 to get a clunker off the road can eliminate the same amount of pollution as spending \$3,000 to \$4,000 on stationary source controls. The program is discussed in a *Federal Register* notice EPA issued in April 1992 to help states interpret planning requirements of the 1990 Amendments.

Building Flexibility Into Clean Air Act Programs

In every title of the 1990 Amendments, EPA is finding new opportunities to harness the power of the marketplace. Examples of other programs using market-based or other flexible regulatory approaches include the following:

- ◆ **Air toxics early reductions.** A final "early reductions" rule announced in October 1992 encourages companies to cut toxic emissions by 90 percent or more now, rather than waiting for EPA to issue control technology standards for their industries. In exchange, companies choosing to participate are given six extra years to comply with the standards.
- ◆ **Control of air toxics from chemical manufacturing.** A proposed rule announced in October 1992 will regulate toxic emissions from synthetic organic chemical manufacturing plants. Through an emissions averaging system, companies could choose which vents and other emissions points to control to achieve the required emissions reductions in

- the most efficient way. Companies also would be allowed to bank credits from extra reductions for future use.
- ◆ **CFC phase out.** EPA regulations require a phase out of chloro-fluorocarbons (CFCs) and other chemicals that are most damaging to the stratospheric ozone layer. During the phaseout, manufacturers and importers are allowed to buy and sell production rights.
 - ◆ **Reformulated and oxygenated gasoline.** The 1990 Amendments require cleaner, reformulated gasoline in the nine cities with the worst ozone pollution, and oxygenated gasoline in 39 cities with carbon monoxide pollution. Refiners will receive credits for going beyond the clean fuel standards. A person with credits can sell some gasoline not meeting the requirements, or trade the credits to another fuel seller in the same area.
 - ◆ **Heavy-duty engine standards.** Emissions standards for heavy-duty truck and bus engines allow manufacturers to earn credits for engine families EPA certifies as being cleaner than required. Under an averaging program begun in 1985, manufacturers could use credits to certify engine families that did not meet the standard. A July 1990 final rule extended the system to allow manufacturers to bank credits for use in future years, or to trade credits to other manufacturers of similar engines.
 - ◆ **Air pollution permit fees.** The 1990 Amendments require companies to obtain operating permits for all major sources of air pollution. State and local permitting agencies are to collect permit fees sufficient to pay the cost of the permit program. The fees will give companies an economic incentive to reduce the amounts of regulated air pollutants they emit - as well as generate \$300 million a year nationwide for state and local air programs.
 - ◆ **Operating flexibility.** The permits rule is designed to give manufacturers flexibility to change their operations quickly without having to obtain a permit revision. For example, states must allow permits that provide for alternate operating scenarios, such as changing from one product to another. Also, the state must allow permits to include provisions for emissions trading within a facility, to the extent provided by the underlying federal or state standard.
 - ◆ **Clean-fueled vehicles.** EPA has proposed rules for clean-fueled vehicle programs that promote innovative technologies and regulatory flexibility through marketable credit systems. (See Chapter 5 on motor vehicles.)
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CHAPTER 3

REGULATORY NEGOTIATION: CONSULTING WITH INDUSTRY, ENVIRONMENTAL GROUPS AND STATES

The Clean Air Act Amendments of 1990 called for EPA to issue more than 55 major rules within two years. In response to this difficult challenge, the Office of Air and Radiation changed the way it does business.

Traditionally, the Agency has developed proposed regulations, published them for public comment, and then tried to reconcile differing points of view. But too often, EPA's regulatory efforts have been delayed or even stymied by frequent and protracted litigation. When controversy produces gridlock, the environment suffers.

After many years fighting in the courts, the Office of Air and Radiation has found that it often can be much more effective and less expensive to negotiate than to litigate. The air office, in carrying out the 1990 Amendments, has placed a new emphasis on consulting with interested groups early in the regulatory process and trying to build consensus. Through informal discussions or formal regulatory negotiations, OAR has worked directly with industry, environmentalists, state and local governments and other interested parties to develop proposed regulations.

Formal regulatory negotiations have produced agreements on proposed rules to prevent toxic emissions from equipment leaks, set requirements for cleaner "reformulated" and "oxygenated" gasolines, and cut toxic emissions from steel industry coke ovens. Informal talks and consultation with advisory committees have produced broad agreement on rules that

control acid rain and phase out chlorofluorocarbons, which deplete the stratospheric ozone layer.

The air office's efforts to foster consensus on implementation of the Act include the establishment in November 1990 of the Clean Air Act Advisory Committee, which includes members from industry, environmental groups, state and local governments, and academia. The committee, not required by law, was formed to advise the Agency on clean air policy, economic, scientific and enforcement issues.

While the framework for implementing the 1990 Amendments is being developed primarily at the national level, most of the specific programs to carry it out will be crafted at the state and local level. EPA has been recommending that states and localities use collaborative approaches. With the assistance of the Clean Air Act Advisory Committee, EPA in 1992 published a guide called "The Clean Air Act of 1990: A Primer on Consensus-Building."

What is "Reg-Neg?"

A regulatory negotiation, known as "reg-neg" for short, begins with the establishment of a formal advisory committee by the Agency. EPA seeks to invite a balanced mix of people to participate and represent identified interests. Generally, committees consist of 12 to 25 members. A neutral mediator convenes the committee and manages meetings.

Meetings are announced in the *Federal Register* and are open to observation by members of the public. Decisions are made by consensus, not majority vote. EPA participates in the negotiations on behalf of the government.

If consensus is reached, the Agency uses the agreement as the basis for the proposed rule. Members of the negotiating committee agree to support the rule as proposed if there are no substantive changes from the consensus agreement. As under the conventional rulemaking process, the proposed rule is published in the *Federal Register* for public comment.

Negotiated rules are more likely to be accepted by industry and other interested parties, reducing chances of litigation. The process enables the Agency to tap the expertise and creativity of committee members to come up with solutions that best address the concerns of all interests. Critical public comment may be reduced, cutting the time needed to finalize the rule. In addition, rules developed through negotiation may be more pragmatic and easier to implement.

Accomplishments

EPA has used regulatory negotiation and informal consensus-building processes to produce agreements on several regulations.

Equipment leaks. Equipment leaks such as faulty valves cause significant emissions of air toxics and smog-forming volatile organic compounds from synthetic organic chemical manufacturing plants. Because the emissions escape at ground

level, their effect is estimated to be 10 to 40 times greater than equal amounts of pollution from stacks.

A standard to prevent equipment leaks was the first negotiated air pollution rule to be completed after enactment of the 1990 Amendments. After a year of negotiations, thirteen representatives of environmental, industry, federal, state and local government groups reached consensus with EPA in November 1990. A draft rule was published in March 1991. The rule is being formally proposed as part of the air toxics control standard for synthetic organic chemical manufacturers.

The negotiation produced a proposal that relies first on incentives, rather than sanctions, to encourage companies to prevent equipment leaks. Companies that do better than a "base performance level" would be rewarded with less frequent inspection requirements. Companies that fail to attain the performance level would have to conduct more inspections or install improved technology, such as better valves. During the negotiations, industry was willing to support a more stringent base performance level in return for use of the incentive system. Sanctions such as fines still would apply if a company did not carry actions required under the incentive system.

Reformulated and oxygenated gasoline. EPA also elected to use regulatory negotiation to develop rules requiring cleaner, reformulated gasoline in the nine cities with the worst ozone pollution, and oxygenated gasoline in 39 cities with carbon monoxide pollution.

The 28-member negotiating committee included representatives of domestic and foreign auto manufacturers, small and large oil companies, groups representing environmentalists, farmers and citizens, gasoline marketers, methanol and ethanol producers, state and local air pollution regulators, and the Department of Energy. Five months of meetings produced consensus in August 1991.

The reg-neg process produced a proposed rule in much less time than would have been consumed by the traditional process, given the complex and highly technical issues involved. In the end, industry was able to obtain additional flexibility in the form of averaging to meet reformulated and oxygenated gasoline requirements. In return, industry agreed, among other things, to provisions that require reductions in ozone-forming emissions in southern cities greater than the minimum required by the statute.

Coke ovens. Regulatory negotiations produced an agreement in October 1992 to serve as the basis for draft proposed regulations to cut toxic emissions from steel industry coke ovens. The agreement goes beyond the requirements of the 1990 Amendments yet also is designed to help preserve jobs and minimize costs to the steel industry.

For example, the agreement would require flares on bypass releases of coke oven gases to incinerate pollutants that otherwise would simply escape into the atmosphere. Bypass releases occur, for example, when a compressor breaks and gases must be vented for safety reasons. Although such releases are infrequent, the

amounts of toxic emissions resulting can be very large.

The reg-neg committee, which began meeting in February 1992, includes 22 parties representing EPA, state and local air pollution agencies, environmental and citizens groups, unions and steel industry trade associations.

Acid rain. Proposed core rules to carry out the acid rain control program were drafted initially by the Acid Rain Advisory Committee, which EPA established in August 1990 to advise the Agency on policy and technical issues. The committee includes representatives of utilities, environmental groups, state utility and environmental regulatory agencies, air pollution control manufacturers, the coal industry, mine workers, experts from academia, and others.

Grand Canyon visibility. EPA in October 1991 issued a final rule that will significantly improve visibility in the Grand Canyon by requiring a 90 percent cut in sulfur dioxide emissions from the Navajo Generating Station, a coal-fired power plant in northeastern Arizona. The rule was based on an agreement facilitated by EPA among power plant owners, environmental groups, and the State of Arizona.

The agreement called for an annual limit on emissions and shutdown of some plant units for maintenance during the winter months, thereby reducing emissions during the time the plant contributes most to visibility impairment. The result is more visibility protection for the Grand Canyon at a lower cost than would have resulted under EPA's proposed rule.

The agreement was remarkable because environmentalists and power plant owners began from seemingly irreconcilable positions. Key to the compromise was changing the monthly emissions limit in the proposed rule to an annual limit. With the added flexibility, power plant owners concluded that they could achieve the 90 percent reduction without having to install expensive backup scrubber units to cover those rare occasions when emission control equipment broke down.

CFC phase out. Rules to phase out chlorofluorocarbons (CFCs) and certain other substances that deplete the stratospheric ozone layer were developed with the assistance of the Stratospheric Ozone Protection Advisory Committee, which includes members from industry and environmental groups.

Streamlined Rulemaking

In addition to using consensus-building approaches, OAR has used a streamlined Agency rulemaking process to expedite implementation of the 1990 Amendments. OAR worked with the Office of Policy, Planning and Evaluation and the rest of the Agency to develop this process for Clean Air Act rules. The advantages of the new system are leading other EPA offices to consider adopting similar systems.

Following enactment of the 1990 Amendments, the air office concluded that EPA's existing internal review process was too slow to meet the task of issuing more than 55 air rules in two years. The new system, implemented in 1991, was designed to expedite action while still providing

EPA offices an opportunity for proper review of draft regulations and guidelines.

Under the new system, draft rules are placed into one of four categories, depending on the degree of controversy and interest among EPA offices. A different review process applies to rules in each category. The least controversial rules go through a streamlined process that involves the least cross-agency review. The most controversial and precedent-setting rules receive personal attention from the deputy administrator of EPA and go through substantial cross-agency review.

CHAPTER 4

ATTAINING AIR QUALITY STANDARDS IN URBAN AMERICA

The United States has made substantial progress in reducing air pollution since passage of the 1970 Clean Air Act. Much of the progress has been in reducing levels of six common pollutants for which EPA has issued health-based national air quality standards: lead, carbon monoxide, particulate matter (soot, dust and other particles), sulfur dioxide, nitrogen dioxide and ground-level ozone.

Emissions data best illustrate changes from 1970 to 1991. The most dramatic drop is in lead emissions, which plunged 98 percent. Emissions of particulate matter (soot, dust and other particles) dropped 61 percent, carbon monoxide 50 percent, and sulfur oxides 27 percent. Volatile organic compounds and nitrogen oxides, which combine in the atmosphere to form ozone, declined 38 percent and 1 percent respectively.

In 1991, 41 of 98 areas designated under the Clean Air Act Amendments of 1990 as having ozone pollution problems came into compliance with the national air quality standard for ozone. In addition, 13 of the 42 areas designated as having excessive carbon monoxide levels met the standard in 1991. Variations in weather patterns from year to year played a critical role in the improved ozone levels. EPA also attributes the improvements to federal limits on gasoline's volatility (tendency to evaporate) and the replacement of older cars with newer, cleaner ones.

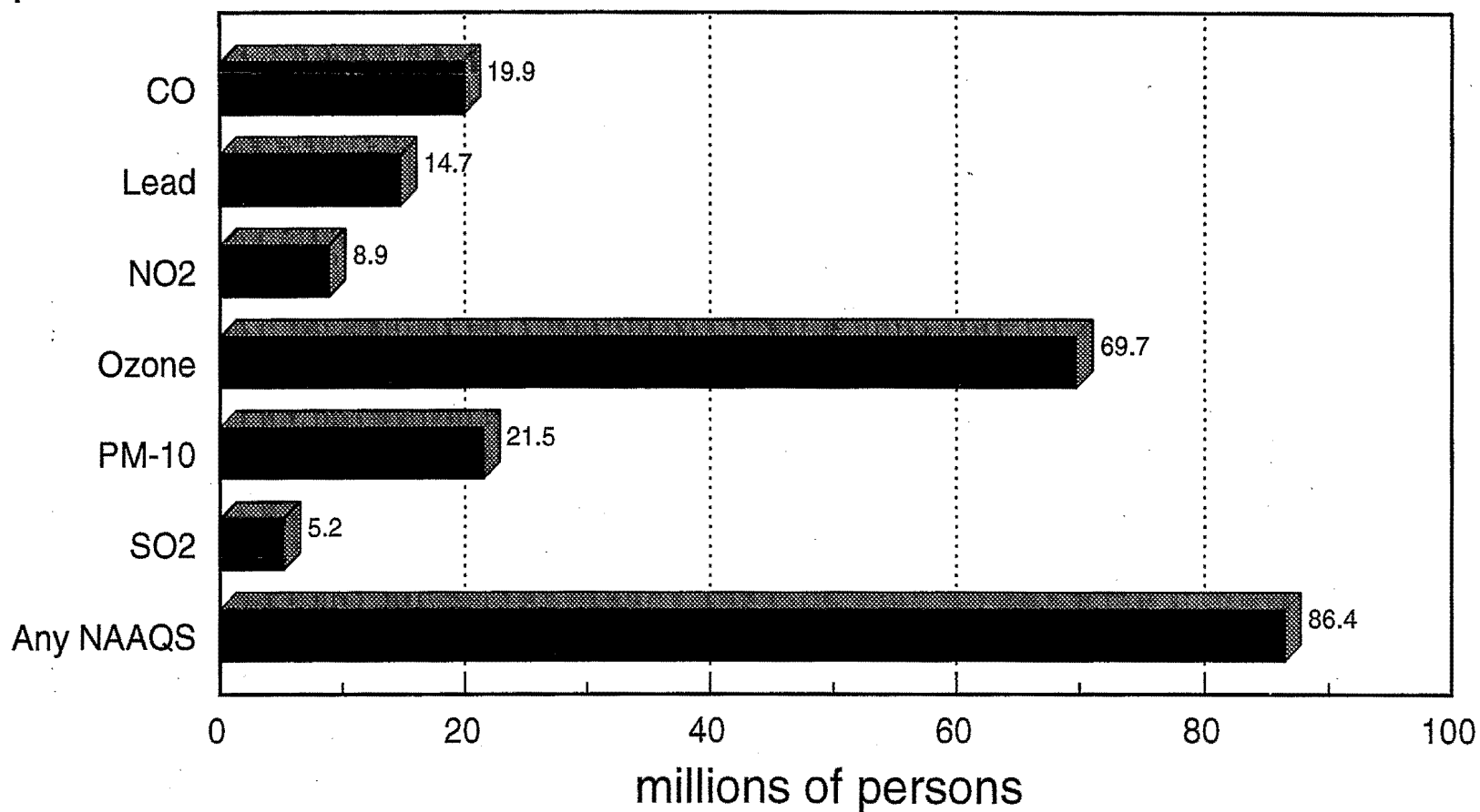
Despite the progress, serious air pollution problems remain. Consider the following examples:

- ◆ Ozone, the primary constituent of smog, continues to be the most prevalent problem; 70 million people live in counties where pollution levels in 1991 exceeded the federal air quality standard for ozone. Ozone can cause reduced lung function and other respiratory problems, and may lead to chronic lung diseases. Ozone also damages forests and causes billions of dollars in crop losses annually.
- ◆ More than 21 million people live in counties with excessive particulate levels. Particulates can interfere with breathing, aggravate existing respiratory and cardiovascular disease and reduce visibility.
- ◆ More than 19 million people live in counties with excessive carbon monoxide levels. Low levels of CO can aggravate angina pectoris, a cardiovascular disease, and may hinder prenatal mental and physical development.

States and EPA share responsibility for ensuring that all areas attain federal air quality standards by deadlines specified in the 1990 Amendments, which range from three to 20 years. States develop an enforceable implementation plan for each non-attainment area. Each plan includes specific requirements to reduce pollution from factories, businesses and motor vehicle traffic. EPA's role is to issue guidance or regulations to guide state actions, and to ensure that states devise and carry out adequate plans.

Number of Persons Living in Counties with Air Quality Levels Above the Primary National Ambient Air Quality Standards in 1991

pollutant



Based on 1990 population data and 1991 air quality data.

Laying the Groundwork

The foundation for implementation of the new non-attainment program is the designation of cities and other areas with air pollution levels exceeding federal air quality standards. In November 1991, EPA designated 98 areas with ozone pollution, 42 areas with carbon monoxide pollution, 71 areas with fine particle pollution, and 12 with lead pollution, as non-attainment areas. These areas are subject to special control requirements that do not apply in clean air areas.

The 1990 Amendments revolutionized the process of classifying polluted areas, extending coverage and control requirements to whole metropolitan areas rather than smaller geographic units. The new designations for ozone added 101 new counties with a population of 15 million to non-attainment status. The designations for carbon monoxide added 18 new counties with populations totaling 4 million.

Another major change is that non-attainment areas now are classified according to the severity of the pollution. Under the Act, control requirements -- and deadlines for attaining air quality standards -- vary depending upon this classification.

Kansas City has become the first of the 98 ozone non-attainment areas formally redesignated by EPA as being in attainment. EPA approved the state's plan showing how Kansas City will maintain compliance with the ozone standard during the next 10 years.

The Agency in March 1992 proposed rules for improved monitoring of ozone and its precursor pollutants. Better monitoring should enable states to design better control strategies. The Agency also has developed state-of-the-art computer models -- the regional oxidant model (ROM) and the urban airshed model (UAM) -- to estimate how emissions changes affect pollution levels on a regional and urban basis.

Guiding the States

In April 1992 EPA issued a 400-page document providing states with guidance on how to develop programs to reduce ozone and carbon monoxide pollution. The so-called "general preamble" describes how EPA preliminarily interprets state planning requirements in Title I of the 1990 Amendments. Based on these interpretations, EPA will propose to approve or disapprove revisions to state implementation plans. The revised plans must show how states plan to bring non-attainment areas into compliance with federal air quality standards -- in most cases, by 2000.

The document describes the actions EPA currently believes states must take to reduce emissions. Also included is guidance on requirements that apply to new pollution sources, sanctions that states face if they fail to submit and implement adequate plans, and the relationship between permits and state plans.

A 1991 report by the National Research Council, *Rethinking the Ozone Problem in Urban and Regional Air Pollution*, found that in many areas of the United States, greater control of nitrogen

oxides is needed to combat ozone effectively. EPA in October 1992 announced supplemental guidance to states on implementing nitrogen oxides control requirements for factories and plants located in ozone non-attainment areas. Existing major sources of nitrogen oxides must install reasonably available control technology to reduce NO_x emissions. New major sources of NO_x must install controls that result in the lowest achievable emission rate, and must obtain offsetting emissions reductions from other sources. By 2000, these requirements are expected to reduce annual NO_x emissions by about one million tons.

Also key to the effort to combat ozone and carbon monoxide pollution is a November 1992 rule to require high-tech vehicle emissions inspection and maintenance programs in many cities starting in 1995. This program holds the potential for bigger reductions of ozone-forming emissions than any other Clean Air Act measure.

The Agency has issued guidelines to aid state implementation of clean-fueled vehicle programs, and guidelines for state programs requiring oxygenated fuels in 39 cities with carbon monoxide pollution. Standards have been proposed for cleaner, reformulated gasoline required in the nine cities with the worst ozone pollution. (For more on these actions, see motor vehicles and fuels chapter.)

EPA also has issued guidance on

- ◆ best available control measures for fine particle pollution
- ◆ cost-effectiveness of controls

- ◆ emission inventories for volatile organic compounds and carbon monoxide

National Control Requirements

Another way EPA helps states bring down pollution levels is by issuing national pollution control requirements for new motor vehicles, fuels and other sources of air pollution.

To reduce vehicle emissions, EPA recently has issued standards to limit gasoline's volatility, cut tailpipe emissions from cars and light trucks, and reduce the sulfur content of diesel fuel. Proposed rules would reduce fuel vapor evaporation from cars and trucks and require the on-board computers built into new motor vehicles to have the capability to detect and aid in diagnosis of emissions control problems.

EPA also has targeted offshore oil rigs, hazardous waste facilities, solid waste landfills and mineral processing plants for air pollution controls.

New, more stringent emissions standards for offshore oil facilities were finalized in September 1992. Some offshore oil facilities emit large amounts of ozone-forming pollutants that contribute to ozone pollution on shore.

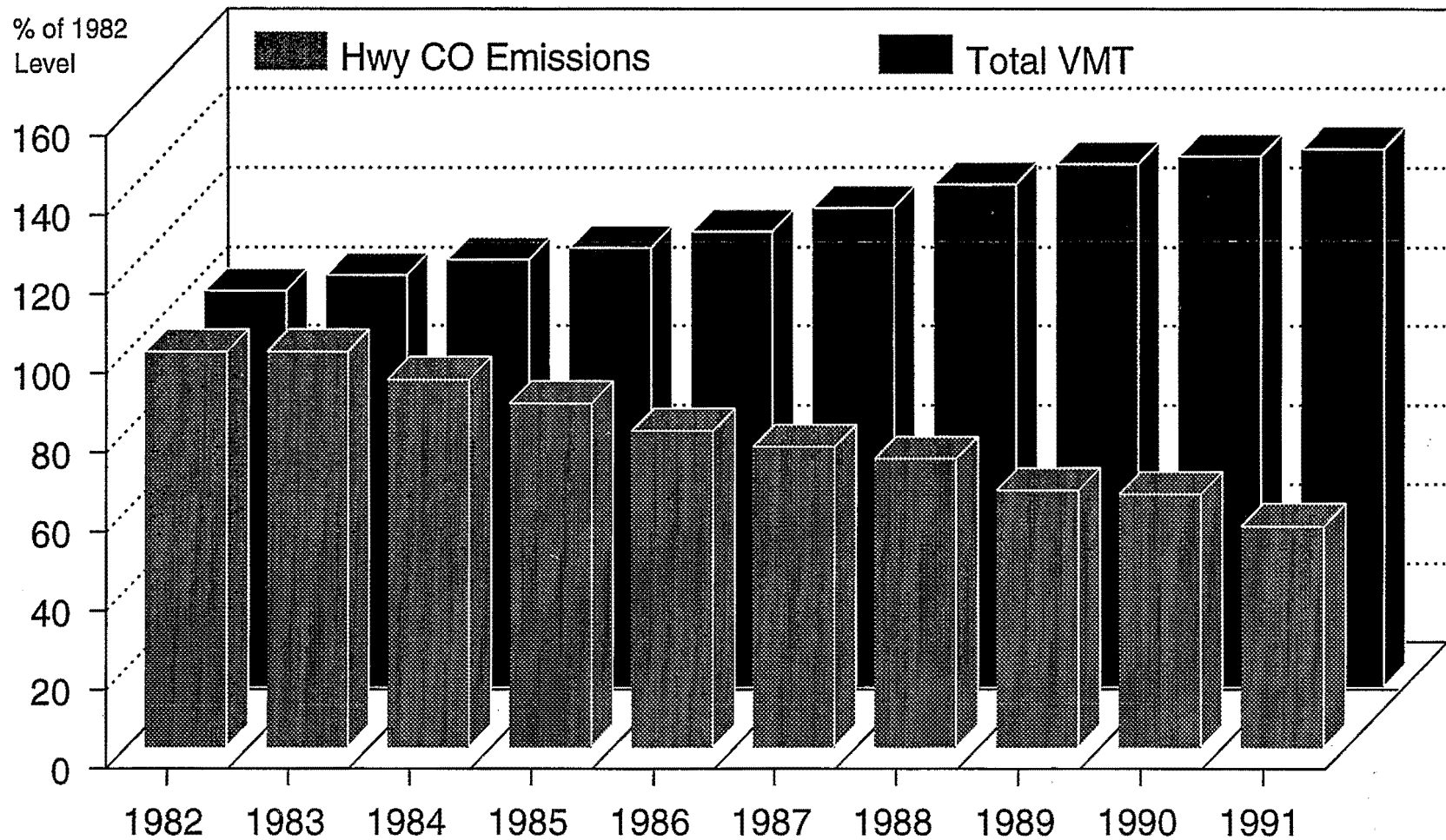
The rules for offshore facilities, which apply to most areas off the U.S. coast, seek to equalize onshore and offshore air pollution requirements. In three Southern California counties -- Los Angeles, Santa Barbara and Ventura -- the rule by 1994 will cut emissions of nitrogen dioxide by

more than 750 tons annually, and volatile organic compounds by 620 tons annually.

In addition, EPA has undertaken the following initiatives:

- ◆ EPA in May 1991 proposed air emissions standards for large solid waste landfills that would reduce emissions of ozone-forming VOCs by nearly 425 million pounds per year. The standards will apply to an estimated 620 existing landfills and 90 new landfills projected to be built in the next five years.
- ◆ Standards for hazardous waste facilities, proposed in July 1991, would reduce VOC emissions from tanks, surface impoundments and containers by 90 percent. An earlier rule for these facilities, finalized in June 1990, requires control of VOCs from process vents and equipment leaks.
- ◆ Fine particle emissions from mineral processing and production plants would be reduced 8,800 tons annually by 1997 under a final rule issued in October 1992.

Trend in Highway Vehicle CO Emissions and Total Vehicle Miles Traveled



CO Hwy Emissions: 45 percent decrease
Total Miles Traveled: 36 percent increase

CHAPTER 5

INTRODUCING CLEANER MOTOR VEHICLES AND FUELS

Americans love their cars -- but not the serious urban air pollution problems cars help create. Cars, trucks and buses are responsible for more than half of the estimated 1,500 to 3,000 human cancers caused annually by a limited list of air toxics, and up to 90 percent of the carbon monoxide pollution that plagues many cities.

Vehicles also are responsible for 50 percent of hydrocarbon emissions, and 30 percent of the nitrogen oxides. Those two pollutants combine in the air to form ozone smog - the nation's most widespread and intractable pollution problem.

Although EPA regulations already have cut motor vehicle emissions dramatically, continued progress is needed because of rapid growth in the total number of miles driven. Between 1982 and 1991, the number of vehicle miles traveled increased 36 percent, and the figure has more than quadrupled since 1950.

EPA is attacking motor vehicle pollution by carrying out a four-part strategy outlined in the 1990 Amendments -- cleaner fuels, cleaner new vehicles, better maintained vehicles on the road, and clean transportation alternatives.

Cleaner Fuels

For nearly two decades, EPA's efforts to cut motor vehicle pollution focused mainly on emission controls installed on the vehicle (with the notable exception of requirements for reducing lead in gasoline). Today, the most promising way

to make further cuts in vehicle pollution is a balanced attack focusing both on vehicle technology and fuels. That emphasis is reflected in the new name of EPA's "National Vehicle and Fuel Emissions Laboratory" in Ann Arbor, Michigan.

EPA in March 1989 and June 1990 finalized regulations to lower gasoline's volatility in two phases. The nationwide regulations dramatically reduce the release of gasoline vapors, which contain ozone-forming volatile organic compounds and toxic substances such as benzene, from motor vehicles. Reducing gasoline volatility is one of the most effective and least costly measures available to combat smog.

The Agency now is taking even more dramatic actions to make gasoline less polluting. Reformulated gasoline will be required in the nine cities with the worst ozone pollution -- one-fifth of the U.S. gasoline market -- under a rule proposed in April 1992. Guidelines finalized in October 1992 will help states carry out wintertime programs requiring "oxygenated" gasoline in 39 cities with carbon monoxide pollution.

Together, these "clean gasoline" initiatives rank among of the most significant pollution-reducing measures required by the 1990 Amendments to the Clean Air Act. Both proposals embody a ground-breaking August 1991 agreement among EPA and industry, state and environmental group representatives who served on a regulatory negotiation committee convened by the Agency.

Reformulated gasoline, required starting in 1995, will reduce ozone-forming VOC and toxic emissions by at least 15 percent compared with baseline 1990 gasoline. The law calls for even cleaner gasoline in 2000, with emissions reductions of at least 20 percent.

The nine cities where reformulated gasoline is federally required are Baltimore, Chicago, Hartford, Houston, Los Angeles, Milwaukee, New York City, Philadelphia and San Diego. Twelve states, including many in the Northeastern and Mid-Atlantic regions, have opted to have additional cities with ozone problems included in the reformulated gasoline program.

Oxygenated fuel programs, required in 39 cities starting in November 1992 will reduce motor vehicle emissions of carbon monoxide by an estimated 17 percent. The programs also will increase use of ethanol, a fuel made from corn, and MTBE, a natural-gas derivative. Both additives boost the oxygen content of gasoline, resulting in better fuel combustion and lower carbon monoxide emissions, especially in older vehicles.

EPA's proposed guidelines allow gasoline suppliers for the 39 cities to meet minimum oxygen content standards in a flexible and cost-effective manner. Those selling fuel with higher-than-required oxygen content will be able to sell credits to other fuel sellers, enabling them to sell gasoline with less oxygen than required. Similar credit systems are proposed for meeting requirements in the reformulated gasoline rule.

Complementing EPA's clean-fuels efforts is a partial exemption for ethanol-blended gasoline from the federal excise tax on gasoline. The exemption historically applied only to blends of 10 percent ethanol and 90 percent gasoline. The newly enacted Energy Policy Act of 1992 extends the exemption to blends using lower percentages of ethanol, on a prorated basis.

Cleaner New Vehicles

One of EPA's early actions to carry out the new Act was to propose tough new tailpipe emissions standards for new cars and light trucks, to be phased in between 1994 and 1998. Finalized in June 1991 the standards will require automakers to reduce exhaust emissions significantly for the first time since 1981.

For cars, the standards require a 30-percent reduction in hydrocarbon emissions and a 60-percent cut in nitrogen oxide emissions, relative to current standards. In addition, manufacturers are required to make auto emissions controls that operate effectively for a longer period of time.

EPA also has finalized a new tailpipe standard to reduce carbon monoxide emissions from cars and trucks during cold weather. The "cold CO" standard, once fully implemented, will reduce carbon monoxide emissions by 20 to 29 percent at 20 degrees Fahrenheit -- and save 43,000 barrels of oil a day through improved fuel combustion.

The Agency is promoting introduction of "clean-fuel vehicles" by aiding in implementation of two state-run programs

required by the 1990 Amendments. To be considered clean-fueled, a vehicle must meet tailpipe emission limits tougher than for conventional vehicles. These vehicles may run, for example, on reformulated gasoline, compressed natural gas, liquified petroleum gas, methanol or ethanol.

One program, a pilot program for California, mandates production of 150,000 clean-fuel vehicles beginning in model year 1996, and 300,000 a year in model 1999 and thereafter. The second program, required in 22 cities, requires a 50- to 70-percent of new fleet vehicles -- such as taxis and delivery vans -- to be clean-fueled beginning as early as 1998.

For both programs, the Agency has issued proposed rules that promote innovative technologies and regulatory flexibility through marketable credit systems. Fleet operators and vehicle manufacturers that go beyond minimum requirements could sell credits to other that did not want to buy or make as many clean-fuel vehicles as required.

EPA is actively encouraging fleet owners to buy vehicles that have inherently low evaporative emissions -- such as vehicles powered by methanol, ethanol, compressed natural gas or electricity. Clean-fuel vehicle standards are based on tailpipe emissions, but some types of fuels inherently have lower evaporative emissions than gasoline. The proposed rule, issued in October 1991, allows clean-fuel fleet vehicles certain exemptions from transportation control measures that states may impose. At EPA's initiative, the rule would provide additional exemptions, such as allowing use of high-occupancy-vehicle

carpool lanes, for inherently low emitting vehicles (ILEVs).

Proposed national emissions standards for natural gas vehicles were announced in October 1992. The standards, which are equivalent to those for gasoline-fueled vehicles, are intended to create a level playing field for natural gas vehicles in the marketplace. The standards limit emissions of carbon monoxide, nitrogen oxides and non-methane hydrocarbons.

EPA is close to issuing final standards for improving the control of evaporation of gasoline vapors from cars and trucks, which occur while vehicles are parked or running. Evaporative emissions account for more than half of passenger car emissions of volatile organic compounds, contributing to ozone and toxic pollution.

EPA has received more complaints about the black billows of smoke from urban buses than any other motor vehicle pollution problem. Diesel particulate pollution will be substantially cut by an EPA rule, finalized in 1991, that requires an 80 percent reduction of sulfur in diesel fuel by October 1993. To go along with the requirement for cleaner fuel, the Agency has proposed new controls on urban buses. Proposed standards for model years 1993 and 1994 would cut diesel particulate emissions 95 percent from uncontrolled levels.

Better Maintained Vehicles on the Road

To ensure that tough emissions standards effectively cut emissions, the 1990 Amendments require vehicle emissions inspection programs in more

areas of the country -- 181, up from 125 programs in effect today. These programs test motorists' cars and trucks to ensure that they are properly tuned and that their emissions control systems are working.

Under a final rule EPA announced in November 1992, many cities with serious ozone or carbon monoxide pollution problems will soon have high-tech vehicle emissions inspection and maintenance programs. These high-tech, or "enhanced," programs are expected to be three times more effective than current inspection programs in reducing emissions from improperly maintained cars. The program also will be more convenient for car owners, because inspections could be done once every two years rather than annually, the usual frequency under current programs.

This program holds the potential for bigger reductions of ozone-forming emissions than any other Clean Air Act measure. The importance of reducing emissions from vehicles already in use is illustrated by the fact that an estimated 20 percent of all vehicles on the road are creating more than 60 percent of vehicle emissions. I&M programs can reduce vehicle emissions dramatically -- 28 percent for VOCs, 31 percent for carbon monoxide, and 9 percent for NO_x -- at a cost far less than that of alternative pollution control measures.

The new I&M rule requires enhanced programs to have separate "test only" inspection stations, which have proved much more effective than "test and repair" centers where vehicles are often tested and repaired at the same location. Jobs in the auto repair industry are expected to

increase by 3,800 to 11,600 as a result of the rule. While fewer testing jobs will be needed in some areas, additional repair jobs will more than offset the losses.

EPA separately has proposed requiring all new cars and light trucks to utilize their on-board computers to monitor the performance of emission control systems, starting with the 1994 model year. A dashboard signal would alert the driver to problems. Codes stored in the computer's memory bank would help mechanics in diagnosing and making repairs.

The net cost of the equipment, accounting for improved repair and fuel economy over the vehicle's life, would be \$40 for new cars and \$30 for new trucks.

Clean Transportation Alternatives

EPA and the Department of Transportation are bridling a working partnership as they coordinate implementation of the Clean Air Act and the Intermodal Surface Transportation Efficiency Act of 1992.

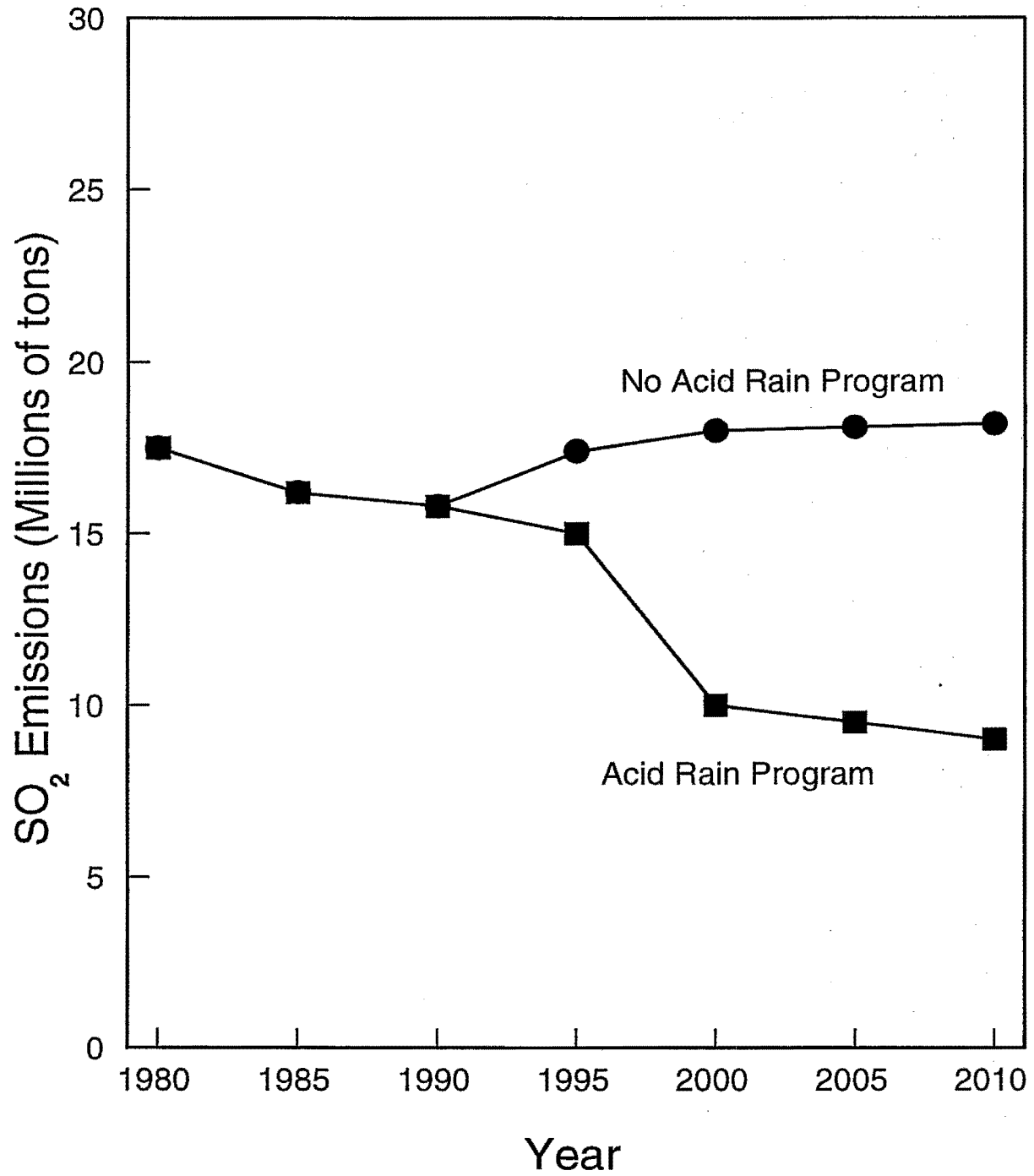
That partnership has produced guidance to help cities and states promote alternatives to the single-commuter car. EPA in May 1992 published guidance on transportation control measures such as carpooling, high occupancy vehicle lanes and mass transit. Another guideline, to be published soon, explains options for employer programs to reduce the number of trips driven.

EPA and DOT also are working cooperatively on revised regulations to help transportation planners properly

consider air quality and to ensure that transportation plans are in conformity with state air pollution control plans.

After coordinating with EPA, DOT in October 1992 issued guidance on the spending of funds earmarked under ISTEA for transportation projects or programs that will contribute to attainment of federal air quality standards, particularly the ozone and carbon monoxide standards. ISTEA authorizes \$6 billion for fiscal years 1992 through 1997 for such purposes under the Congestion Mitigation and Air Quality Improvement Program.

Utility SO₂ Emissions



CHAPTER 6

COMBATting ACID RAIN

After more than a decade of battles between environmentalists and industry, President Bush proposed and Congress passed legislation to control acid rain as part of the Clean Air Act Amendments of 1990.

Acid rain -- the common term for acid deposition -- is created when sulfur dioxide and nitrogen oxides given off by fossil fuel combustion react in the atmosphere to form sulfuric and nitric acids. The pollutants return to earth in the form of rain, snow, fog, dry particles or gases.

Acid deposition has acidified lakes in regions such as the Adirondack Mountains of New York, the Upper Peninsula of Michigan, and southern New England. A 1988 EPA survey found that acid deposition is the main reason that 4,455 kilometers of streams in the mid-Atlantic and Southeastern states are acidic. Acidic clouds have contributed to the decline of high-elevation red spruce in the Appalachians.

Pollutants associated with acid rain -- including sulfur dioxide, sulfates and acid aerosols -- can impair breathing and increase the incidence of respiratory diseases, and may contribute to chronic illnesses. EPA is studying whether these effects occur at pollution levels currently found in the United States. Visibility is impaired throughout the country and in many national parks by fine particle pollution, much of which is formed from acid rain precursor pollutants.

The 1990 Amendments call for annual sulfur dioxide emissions in the United

States to be cut 10 million tons from the 1980 level, mainly through a 50-percent cut in emissions from fossil-fuel-burning power plants. The program includes an innovative system of marketable emissions allowances that gives the utility industry flexibility to reduce emissions in the least costly way.

In addition, utilities must meet requirements for controlling nitrogen oxide emissions that -- in conjunction with other provisions of the Act -- are intended to reduce NO_x emissions by approximately two million tons from the 1980 level. Additional NO_x reductions are required from motor vehicles and from industrial plants in ozone non-attainment areas.

EPA has made great strides toward full implementation of the acid rain control program. In October 1992 the Agency announced a package of final rules implementing the key elements of the sulfur dioxide reduction program. Nearly simultaneously, a proposed rule to accomplish the NO_x reductions was unveiled.

In 1990, the program's cost to utilities was estimated at \$3 billion to \$3.9 billion a year upon full implementation in 2005. Without the allowance trading system, that estimate would be \$1 billion higher. EPA now believes the cost is likely to be considerably less due to an improved outlook for scrubber efficiency, cheap low-sulfur coal, improved energy efficiency and low-cost clean coal technology use.

The cost of the SO₂ reductions will raise consumer electricity rates after the

year 2000 by 0.5 percent to 1.2 percent, on a national average basis. The NO_x rule is expected to cause a 0.1 percent increase in the national average electricity rate.

The SO₂ Program

The package of SO₂ rules includes regulations governing the allowance trading system, penalties for exceeding emissions limits, continuous emission monitoring requirements, and permit requirements.

The SO₂ reduction will be achieved in two phases. By 1995, the 110 large plants that are the most heavily polluting must reduce emissions. Most of these are coal-fired plants.

In 2000, when the second phase begins, the 110 large dirty plants must further reduce emissions, and limits are imposed on 800 smaller plants and cleaner plants. A permanent annual cap of less than 9 million tons is placed on overall utility SO₂ emissions to prevent the total from rising again as electricity production increases.

Utilities are granted great flexibility on ways to reduce emissions. The options include switching from high-sulfur coal to low-sulfur coal or natural gas, installing flue-gas scrubbers or other technologies, shifting some electricity production from dirtier plants to cleaner ones, and encouraging more efficient electricity use by customers. Strategies will be spelled out in permits containing Clean Air Act requirements for each utility generating unit.

The 1990 Amendments, a compromise among many interests, provide a two-year extension of the Phase I deadline and extra allowances as incentives for use of scrubbers to reduce job losses in high-sulfur coal mining areas. Extra allowances also are provided for reducing emissions through conservation or renewable energy sources. A four-year extension of the Phase II deadline is available for plants that comply by replacing boilers with clean coal repowering technologies.

The SO₂ program is built on an innovative system of marketable emissions allowances. This approach, a centerpiece of the clean air bill proposed by President Bush in 1989, was adopted as part of the Clean Air Act Amendments of 1990.

An allowance entitles the holder to emit one ton of SO₂. EPA grants each utility generating unit a number of allowances corresponding to its SO₂ emissions limit. Utilities that can control emissions most cost effectively -- often those with big, high-emitting coal-fired plants -- can reduce emissions more than required and sell their extra allowances. Utilities that find reducing emissions more costly can purchase additional allowances to meet all or part of their control requirements. In this way, the system provides the industry with flexibility to achieve the overall SO₂ reduction in the most cost-effective manner.

Actions taken during 1992 show that the market for allowances is developing. The first allowance sales were announced in May 1992 by Wisconsin Power and Light. The Chicago Board of Trade has announced its intention to develop a "futures" market in allowances.

To stimulate the allowance market, the 1990 Amendments set aside a small number of allowances that EPA will distribute through annual auctions and direct sales. EPA finalized rules governing auctions and sales in December 1991.

In September 1992, EPA delegated administration of the auctions and sales to the Chicago Board of Trade. Anyone can buy allowances and profit if the price of allowances rises over time.

Key to the entire program is the ability of EPA and states to monitor emissions reductions accurately. As required by the 1990 Amendments, EPA rules require utilities to use highly accurate systems for continuous emissions monitoring of SO_2 , as well as other pollutants including NO_x . Results must be reported every three months. This ensures that plants comply with their emission limits and allows verification that allowances being offered for sale have not been used and are actually available.

The Agency took care to ensure that the monitoring data will not be biased high or low, to ensure that allowances are a standard commodity and that the program achieves its environmental goals.

When a plant's emissions exceed its allowances, the utility will be subject to a tough financial penalty - \$2,000 for every ton of excess emissions. This gives utilities a strong incentive to ensure their own compliance.

The NO_x Program

Also aimed at reducing acid rain is a proposed rule to control nitrogen oxides

from the electric utility industry. EPA estimates that the proposal would cut annual utility NO_x emissions by 1.5 million to 2 million tons from the level projected for the year 2000 without the rule.

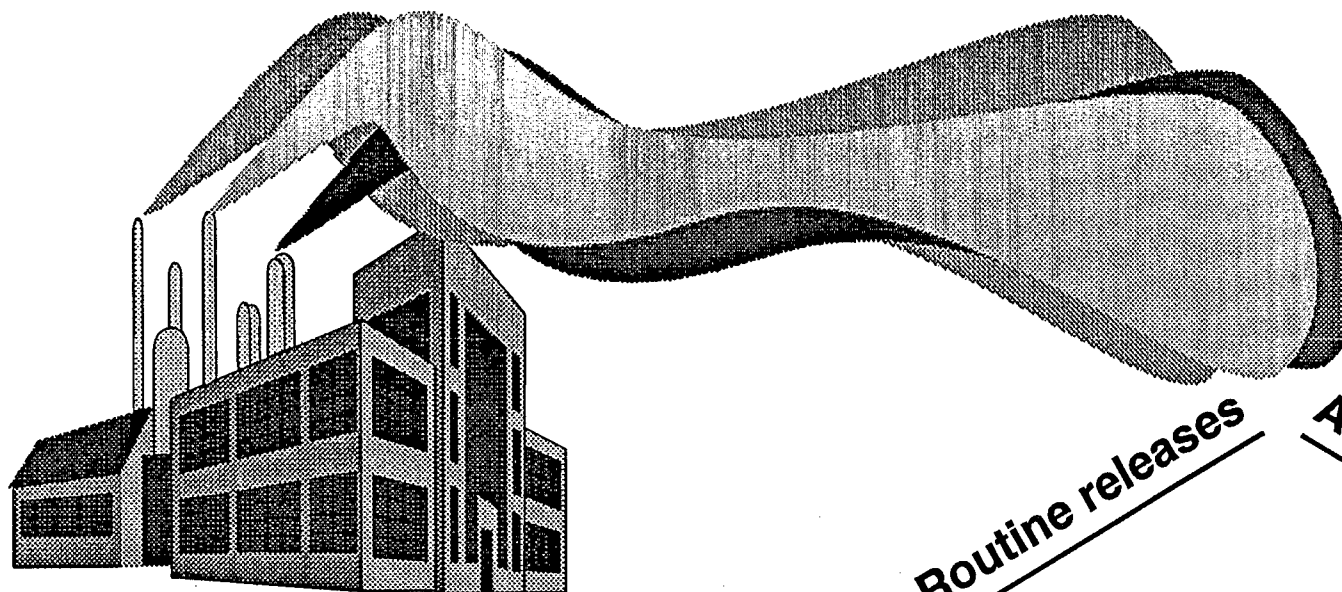
The proposal represents the first time EPA has sought to control NO_x from existing plants or factories. Previous rules have required controls on motor vehicles and new industrial plants. (For more on NO_x controls and issues, see chapters on attaining air quality standards and future issues.)

The proposed NO_x emissions limits apply to about 800 coal-fired utility boilers. The plants must comply with NO_x limits on their deadlines for meeting SO_2 limits, which may range from 1995 to the end of 2003. These limits are for tangentially-fired boilers and dry-bottom wall-fired boilers. Separate emission limits for other types of coal-fired boilers are to be set by January 1997.

The proposed rule would allow utilities to comply through averaging annual emission rates of generating units at one or more power plants. The averaging system will enable utilities to reduce emissions in the most cost-effective way.

Further NO_x reductions will result from provisions of the 1990 Act that tighten emissions standards for cars and trucks and require NO_x reductions in areas with ozone pollution.

Air Toxics



Routine releases

Accidental releases

(OSWER)

- Chemical processes & uses
 - Chemical manufacturers
 - Coke oven batteries
 - Fuels, gasoline
 - Smelters, utilities
 - Small sources like degreasers, electroplaters
- 2.4 billion pounds emitted
 - 1500-3000 cancer deaths
 - Reproductive, birth defects, and other serious health effects
 - Secondary exposure via water, soil, etc.

CHAPTER 7

REDUCING TOXIC AIR POLLUTION

Millions of tons of hazardous air pollutants are emitted each year by motor vehicles, major industrial plants, and smaller "area sources" such as electroplating operations, gas stations, and dry cleaners.

A subset of toxic air pollutants evaluated by EPA may cause 1,500 to 3,000 U.S. cancer deaths each year. Air toxics also cause a variety of a non-cancer health problems such as birth defects and damage to the brain or other parts of the nervous system.

Another concern is ecosystem damage, direct and indirect. For example, the deposition of toxics from the atmosphere is a major source of toxic contamination in the Great Lakes. Great Lakes states have issued health advisories warning people not to eat certain sport fish because they contain elevated levels of mercury and other toxics.

To combat the threat of air toxics, the 1990 Amendments require EPA over a 10-year period to issue "maximum achievable control technology" (MACT) standards covering all major industrial sources of toxic air pollution. Industries must comply within three years after a standard is issued. If significant risks remain after MACT controls are installed, tighter standards to protect public health and the environment are required.

Additional provisions require controls on area sources, measures to prevent accidental release of air toxics, and measures to protect the Great Lakes.

Encouraging Early Cuts in Toxic Emissions

EPA initiated innovative new programs to encourage companies to cut emissions of toxic air pollutants even before enactment of the 1990 Amendments.

At the invitation of EPA Administrator William Reilly, nine major petrochemical manufacturers voluntarily agreed in August 1989 to reduce emissions of air toxics through changes in processing and substituting different materials at 40 chemical plants in 14 states. The reductions at the plants, which posed relatively high estimated risks, will total almost 83 percent when fully implemented by December 1993.

Another EPA initiative - the 33/50 project, launched in February 1991 - asks companies to cut voluntarily releases of 17 high-priority toxic chemicals to the air, water and soil. The Office of Pollution Prevention and Toxics, which administers the 33/50 program, has worked closely with the Office of Air and Radiation to coordinate the program with toxic and other air pollution programs. As of mid-October 1992, 966 companies had pledged to reduce their releases of the 17 chemicals by 347 million pounds.

In the regulatory arena, EPA in October 1992 announced a final rule to implement an innovative "early reductions" program to give industries an incentive to reduce toxic air emissions earlier than required by the Clean Air Act. Under this optional program included in the 1990

Amendments, a company would reduce a plant's emissions of certain toxic pollutants by 90 percent or 95 percent before EPA proposes a MACT regulation for that type of industrial facility. In exchange, the plant would be given six extra years to comply with the MACT standard.

To date, 34 companies have made commitments to make early reductions at 49 plants. If all those commitments are carried out, the resulting reductions in toxic air pollutant emissions will total 33 million pounds by January 1, 1994.

Controlling Major Pollution Sources

Recently issued national standards will reduce toxic air pollution from several industries:

- ◆ The Agency in February 1991 issued new standards for large municipal waste incinerators that require a 90-percent overall reduction in pollutant emissions by 1994. The standards require flue-gas scrubbers at new and existing incinerators to limit emissions of metals such as lead and cadmium, organic chemicals such as dioxins and furans, acid gases such as sulfur dioxide, and nitrogen oxides.
- ◆ EPA in May 1991 proposed standards and guidelines for states to use in controlling air pollution from large solid waste landfills. More than three-fourths of the 255,000 metric tons of non-methane organic compounds emitted annually from landfills -- such as benzene and vinyl chloride -- would be controlled.
- ◆ The Agency proposed air emissions standards in July 1991 for 2,300 hazardous waste treatment, storage and disposal facilities. The standards would reduce aggregate cancer risks posed by air toxics from those facilities by an estimated 94 percent.

Meanwhile, EPA has worked to lay the foundation for requiring MACT control technology on all major sources of toxic pollution. These efforts led in July 1992 to promulgation of an initial list of 174 industrial categories potentially subject to MACT standards, which will be issued industry by industry. The list includes eight categories of small "area sources" of toxic emissions, four of which involve commercial dry cleaning or chromium electroplating.

A proposed 10-year schedule for issuing MACT standards was announced in September 1992. The draft schedule calls for the first standards to be issued for synthetic organic chemical manufacturing plants, industrial dry cleaners and commercial dry cleaners, and steel industry coke ovens.

Control technology standards for some 3,700 industrial and large commercial dry cleaners were proposed in November 1991. Air emissions of perchloroethylene, the most widely used solvent in dry cleaning, would be cut at least 13 percent by 1996.

Much of the Agency's early effort to implement the air toxics program has focused on setting a MACT standard for the synthetic organic chemical manufacturing industry. This regulation will reduce hazardous air pollutant emissions

from the industry by 80 percent, or 522,500 tons per year -- more than any other air toxics regulation to be issued under the 1990 Amendments. Emissions of volatile organic compounds, which react to form ozone, will be reduced by nearly 1.1 million tons per year.

The proposed rule, announced in October 1992, would control emissions of 149 hazardous pollutants from approximately 370 chemical manufacturing facilities nationwide. Included are requirements to reduce emissions from equipment leaks; these requirements were the first negotiated by consensus under the 1990 Amendments. Also reflected in the proposal are dozens of discussions the Agency held with the chemical industry, states and the Office of Management and Budget.

Also in October 1992, EPA announced that regulatory negotiations among industry, states, unions and environmentalists had produced an agreement on regulations to reduce toxic emissions from steel industry coke ovens. The agreement goes beyond Clean Air Act requirements to protect citizens from toxic pollutants while helping to preserve jobs and minimize costs to the steel industry. A proposed rule embodying the agreement will be issued in the near future.

Smaller, "Area Sources"

As EPA issues standards for each category of major sources of air toxics, the Agency will simultaneously evaluate whether that industry has numerous small sources of air toxics that warrant regulation. Already, the Agency's urban area source program has underway a

\$1 million study to identify the 30 pollutants from area sources that pose the greatest health risks in urban areas. The law requires EPA to ensure that 90 percent of the emissions of these pollutants are covered by MACT standards or less stringent "generally achievable control technology" standards.

Motor Vehicle Toxics

EPA is undertaking major efforts to combat toxic air pollution from motor vehicles. The Agency has finalized regulations dramatically lowering gasoline's "volatility," or tendency to evaporate. Gasoline vapors contain toxic substances such as benzene.

Standards for reformulated gasoline, proposed in April 1992, will reduce toxic emissions at least 15 percent by 1995 and at least 20 percent by 2000, relative to baseline 1990 gasoline. Reformulated gasoline will be required in the nine cities with the worst ozone pollution, and many Northeastern and Mid-Atlantic states have requested to be included in the program.

Reductions in toxic emissions also are expected from clean-fuel vehicle programs, new evaporative emissions standards proposed for cars and trucks, and other motor vehicle regulations. (See Chapter 5.)

Accidental Releases

The 1990 Act requires EPA to issue regulations for prevention and detection of accidental releases of air toxics, and for response by facility owners or operators. The regulations must require facilities where an extremely hazardous substance is

present in more than a threshold quantity to prepare and implement a risk management plan. The Chemical Emergency Preparedness and Prevention Office (CEPPO) has lead responsibility for implementing these requirements.

EPA expects shortly to propose a rule listing extremely hazardous substances and specifying threshold quantities for determining which facilities must file risk management plans. A proposed rule establishing requirements for these plans has been submitted to the Office of Management and Budget for review.

The Agency already has issued guidance for determining when EPA can use authority granted by the 1990 Amendments to issue administrative orders to halt an imminent or substantial endangerment to health, welfare or the environment.

CHAPTER 8

WHERE THE RUBBER MEETS THE ROAD: PERMITS AND ENFORCEMENT

The 1990 Amendments gave EPA new tools to carry out and enforce the Clean Air Act's requirements: a comprehensive permit system and stronger enforcement powers.

For the first time under federal law, all industrial plants and businesses classified as major pollution sources must obtain operating permits. The permit system, to be administered by state and local air agencies, will facilitate enforcement efforts by states and EPA. Permit fees will provide a new source of revenue for state and local air programs.

The 1990 Amendments also strengthened EPA's power to enforce the Act. The range of civil and criminal sanctions available was broadened, and in many cases sanctions were increased. A key provision granted EPA new authority to assess administrative civil penalties of up to \$25,000 per day of violation, generally up to \$200,000 in a particular case.

Effective compliance monitoring and enforcement are essential to ensure that market-based and other flexible regulatory systems achieve their environmental goals.

The Permits Rule

EPA in July 1992 issued a final rule setting minimum requirements for state air pollution permit programs. Permit programs are the means for translating the Act's requirements into reality - including those for combatting urban air pollution,

acid rain, toxic air pollution, and ozone-layer depletion.

The rule effectuates the requirement that all major air pollution sources to obtain operating permits. Each facility's permit is to contain all of its Clean Air Act requirements. The definition of "major source" varies depending on the pollutant emitted and the severity of pollution in geographic areas exceeding a federal air quality standard.

For the first time on the federal level, the program will collect the Act's requirements for an industrial plant into a single document and provide for periodic monitoring and reporting on compliance. The company will have a road map explaining what it must do, and regulators and the public will have the data necessary to check compliance. This combination should increase compliance rates and yield cost-effective emissions reductions.

State programs. By November 1993, state air pollution agencies must submit to EPA permit programs with minimum elements specified by the Act and EPA's regulations. EPA is given one year to approve or disapprove the programs. State and local agencies are free to make their programs more stringent than mandated by the regulations.

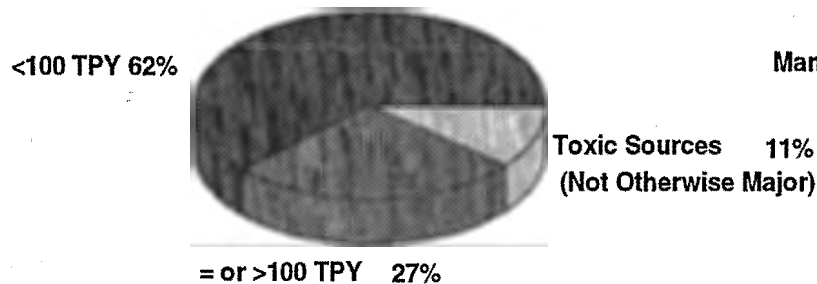
Permit programs must include permit fees sufficient to cover their costs. Permitting authorities will develop their own fee structures, subject to EPA approval. EPA estimates that these fees will generate more than \$300 million a

TITLE V PERMITS

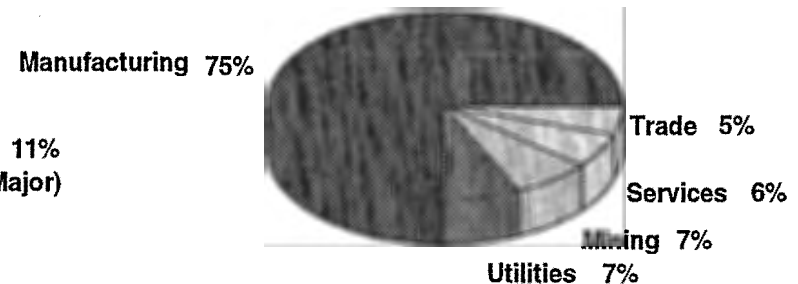
Sources Required to Obtain Permits

(Estimated # 34,000)

Major Sources by Emission Limits



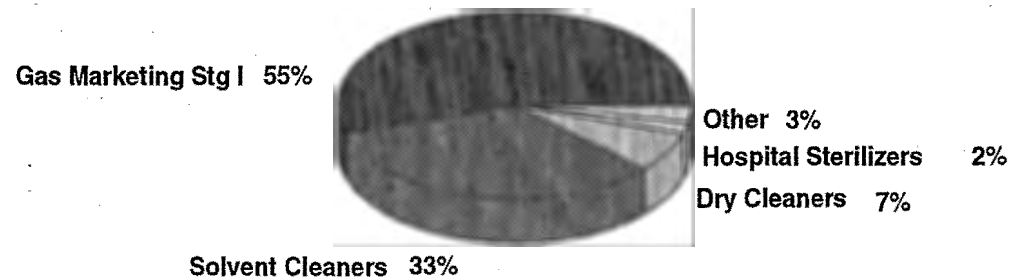
Major Sources by Industry Sector



Sources Potentially Subject to Permits

(Estimated # 350,000)

Nonmajor Air Toxic Sources by Source Category



TPY - Tons per Year

year nationwide for state and local air programs.

Although prior to the 1990 Amendments the Clean Air Act did not require operating permits, approximately 35 states required such permits for some air pollution sources. EPA's rules are designed to build on existing programs and allow states to meet the minimum requirements in a variety of ways.

Minimizing burdens. The permits rule is designed to minimize burdens on the private sector. Within certain limits, manufacturers are given flexibility to change their operations quickly to meet market demands, without first going through a time-consuming permit revision process.

States are given the option of exempting small pollution sources from permit requirements until EPA determines whether small sources should be included. In addition, states are allowed to issue "general permits" covering numerous similar small sources, greatly reducing administrative burdens on small businesses.

In February 1992, EPA issued guidance to help states establish programs for giving small businesses technical and environmental compliance assistance. These programs will help small businesses identify applicable Clean Air Act requirements and will provide them with information on compliance methods.

Enforcing the Act

EPA has issued rules to carry out new enforcement powers granted by the 1990 Act while taking violators to court to

demonstrate the Agency's determination to enforce clean air rules.

An administrative hearing rule and rules for imposing administrative penalties were finalized in 1992. Draft proposed regulations were submitted to the Office of Management and Budget on citizen suits and on monetary awards for people who provide information leading to a criminal conviction or civil penalty under the Clean Air Act. Also in draft form is an enhanced monitoring and compliance certification rule designed to enable states and EPA to better assess sources' compliance over time.

EPA in March 1991 developed a "compliance monitoring strategy" and an "inspection target model" to help states target the most environmentally significant pollution sources for inspections.

In fiscal 1991, EPA referred 86 Clean Air Act cases to the Department of Justice for formal enforcement actions. This was part of a record-setting total of 474 civil judicial and criminal cases referred by EPA to the Justice Department that year. Figures for fiscal 1992 are not yet released.

EPA in May 1992 announced the filing of 52 Clean Air Act enforcement actions using its new authority to levy administrative penalties. The cases, filed in 26 states and Puerto Rico, involve a wide variety of regulations. Penalties totaled more than \$4 million. In all, 100 administrative complaints were filed in fiscal 1992.

Other Clean Air Act enforcement highlights from 1991 and 1992 include the following:

- ◆ Several companies agreed to pay \$1.825 million for violations of the hazardous air pollutant standard for arsenic emissions from glass manufacturing plants. The penalty is one of the largest ever for a hazardous air pollutant violation under the Clean Air Act.
- ◆ One of the highest civil penalties ever imposed under a Clean Air Act consent decree was announced by EPA in December 1991. An electric utility agreed to pay a \$1.31 million fine.
- ◆ Clean Air Act violations were part of several multi-media enforcement initiatives taken by the Agency during 1991 and 1992. Some of those initiatives targeted pollution from lead, benzene, and industries such as pulp and paper and primary metals.
- ◆ In 1990, EPA brought the first lawsuits to enforce U.S. rules implementing the Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer.

Motor vehicle manufacturers also have been the target of EPA enforcement efforts. In recent years, many major automakers have recalled groups of vehicles that were failing to meet tailpipe emissions standards in customer use.

From January 1989 through September 1992, manufacturers issued 146 recalls to rectify emissions problems with nearly 12.5 million vehicles. About 75 percent of these vehicles were recalled after EPA's emissions testing program discovered the problem. The rest were

recalled after manufacturers discovered compliance problems themselves, without EPA involvement. EPA believes that manufacturers are willing to conduct voluntary recalls partly because of the Agency's active enforcement program.

CHAPTER 9

A GLOBAL APPROACH: PROTECTING THE OZONE LAYER AND INTERNATIONAL AIR QUALITY

One of EPA's most urgent missions is to protect the natural ozone layer in the upper atmosphere, which shields the Earth's surface from damaging ultraviolet radiation.

Studies during the second half of the 1980s documented a springtime ozone "hole" over Antarctica and significant ozone losses around the globe. In April 1991, scientists with the National Aeronautics and Space Administration announced that the ozone layer was being depleted twice as quickly as previously thought, and that 4 percent to 5 percent of the ozone layer over the United States had been destroyed during the previous decade.

EPA estimated that the accelerated ozone depletion over the United States could lead to 200,000 additional skin cancer deaths over the next 50 years and an increase in the annual incidence of skin cancer from 500,000 to 800,000 cases. Ozone depletion also is expected to result in suppression of the human immune system and damage to crops and aquatic life.

Evidence is strong that ozone depletion is being caused by release to the atmosphere of chemicals such as chlorofluorocarbons (used in refrigerators, air conditioners, and foam blowers and as cleaning solvents), halons (used in fire extinguishers), carbon tetrachloride and methyl chloroform.

To reduce the threat, the 1990 Amendments to the Clean Air Act require

EPA to phase out ozone-depleting chemicals, place restrictions on use and disposal of those chemicals, and promote development of safe substitutes.

Other EPA efforts to protect international air quality are reflected in recent agreements with Canada and Mexico.

Phasing Out Ozone-Depleting Chemicals

EPA in July 1992 issued a final rule phasing out production and imports of the most damaging ozone-depleting chemicals. The rule carries out requirements of the 1990 Clean Air Act Amendments and fulfills the commitment made by the United States when it ratified the June 1990 Amendments to the Montreal Protocol on Substances that Deplete The Ozone Layer.

The phase-out schedule requires production and imports of chlorofluorocarbons, halons, and carbon tetrachloride to cease by 2000. The phase-out deadline for methyl chloroform is 2002.

Even as EPA worked on the rule, new scientific evidence suggested that the ozone layer was being depleted even more quickly than previously believed. In February 1992, President Bush committed to accelerate the phase-out schedule from 2000 to the end of 1995, four years earlier than mandated by domestic law or the Montreal Protocol. EPA has submitted to OMB a proposed rule to carry out this

commitment. Countries that are parties to the protocol will meet in November 1992 to decide on a similar phase-out world-wide.

Safe Alternatives

While acting to phase out ozone-depleting chemicals, EPA has been promoting movement to safe alternative products and technologies.

Primarily with EPA funding, University of Maryland researchers have completed demonstration models of refrigerators that use significantly less electricity than current models, which use ozone-depleting CFC-12. These refrigerators use a mixture of CFC-substitute refrigerants in a modified refrigerator design.

In cooperation with other nations and industry, the Agency has helped identify testing needed to assess the safety of potential alternatives to CFCs. EPA also cosponsored major international conferences on alternative products and technologies in 1990, 1991 and 1992.

Recycling, Use Restrictions and Labeling

Another focus of Agency efforts has been to prevent the release of ozone-depleting chemicals from the products in which they are used.

The refrigerant in motor vehicle air conditioners constitutes the largest use of CFCs in the United States, accounting for more than 21 percent of total use. EPA in July 1992 issued a final rule requiring service stations to recycle CFCs removed

during servicing of motor vehicle air conditioners. Venting the ozone-depleting chemicals to the atmosphere -- a practice often followed in the past -- is banned.

The rule requires certification of service technicians and recycling equipment at service stations, and restricts the retail sale of small containers of auto air conditioning refrigerant.

Also under the 1990 Amendments, EPA is taking action to discourage use of ozone-depleters. Labeling requirements for products using ozone-depleting chemicals were proposed in May 1992. A rule banning the non-essential use of ozone-depleting chemicals in certain consumer and industrial products was proposed in January 1992. The ban would apply, for example, to noise horns (which are used for boating, sporting events and alarm systems), flexible and packaging foam, and cleaning fluids for electronic and photographic equipment.

New International Accords

The United States has concluded bilateral environmental agreements with Canada and Mexico during the past two years.

The United States and Canada in March 1991 reached a historic agreement to reduce acid rain and other air pollution that crosses the countries' common border. The Office of Air and Radiation played an important role in the negotiations.

Key provisions of the United States/Canada Air Quality Agreement commit both countries to reduce emissions of the two principal acid-rain-causing

pollutants, sulfur dioxide and nitrogen oxides. The U.S. commitments generally track requirements of the 1990 Amendments to the Clean Air Act.

EPA and its Mexican counterpart, SEDUE, in February 1992 announced a plan for tackling the most serious environmental problems in the U.S.-Mexico border area through improved enforcement and other initiatives. To decrease air pollution, the plan includes measures to improve traffic circulation in the border area and increase vehicle emissions inspection programs in Mexico. The plan also calls for expanded air pollution monitoring and preparation of emissions inventories in large cities along the border.

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CHAPTER 10

GREEN PROGRAMS: CONSERVING ENERGY AND ATTACKING THE GLOBAL WARMING PROBLEM

Another international air pollution concern is the contribution of air pollution to global warming. Combustion of fossil fuels and other human activities have increased atmospheric concentrations of carbon dioxide and other "greenhouse gases." These gases allow the sun's light energy to penetrate the atmosphere but trap heat radiated from the Earth's surface.

Scientists differ on the rate of global warming and its likely effects. However, some have forecast rising sea levels, beach erosion, saltwater contamination of coastal ground water supplies, inundation of low-lying agricultural regions and populous coastal areas, ecosystem shifts and extinction of species.

EPA is undertaking innovative, voluntary energy conservation programs that save money while reducing air pollution and emissions of greenhouse gases. These programs are described in an October 1992 brochure titled *The Climate Is Right For Action*, which invites businesses and local governments to participate.

Green Lights

Heading the list is the Green Lights Program, which encourages companies and others to install voluntarily energy-efficient lighting.

Since the program was launched in January 1991, more than 650 companies, state and local governments, and universities have joined. These include

Southern California Edison, Nynex, 3M, Polaroid, Xerox, Chevron and Mobil, 12 states including California and Massachusetts, and M.I.T., Columbia, Indiana and Tufts Universities.

The area covered by the program -- 2.9 billion square feet -- is much greater than the combined square footage of all commercial real estate in Los Angeles, Chicago, Dallas, Detroit and New York.

As of September 1992, EPA estimated that the program was cutting emissions of carbon dioxide, sulfur dioxide and nitrogen oxide by more than 8.5 million metric tons a year and cutting participants' electric bills by \$917 million a year.

Other Green Programs

More recently launched are two other promising voluntary programs: Golden Carrot Super Efficient Refrigerators and Energy Star Computers.

The Golden Carrot program aims for appliance manufacturers to develop and market a CFC-free refrigerator-freezer that is 30 percent to 50 percent more energy efficient than the 1993 Department of Energy standard. The incentive is \$30 million to be awarded in a utility-sponsored contest to the manufacturer that can produce the most cost-effective units at the earliest time. The program is a collaborative effort involving EPA, utilities, environmental groups, state agencies and appliance manufacturers.

Under the EPA Energy Star Computers Program, eight leading computer manufacturers agreed in June to introduce and promote energy-efficient personal computers that enter a low-power state when not in use. These companies, and others that join the program, will be able to label and advertise qualifying computers using the EPA Energy Star logo.

The energy savings and air pollution avoided could be huge because computers are not in active use most of the time they are turned on. Moreover, 30 percent to 40 percent of the nation's 30-35 million personal computers are left running at night and on weekends.

EPA is working on similar programs for industrial motors and commercial building heating and cooling.

In September 1992, EPA and the Pew Charitable Trusts jointly committed more than \$584,000 to help state public utility commissions pursue energy conservation measures. The Regulatory Assistance Project will provide training and technical support to commissions on "least cost integrated resource planning" for electric utilities. The idea is to consider electricity conservation measures and renewable energy options, as well as construction of new conventional power plants, in long-range planning.

Complementary Actions

A number of Clean Air Act regulations and programs will help reduce emissions of greenhouse gases. These include the following:

- ◆ a proposed regulation that will reduce escape of methane gas from solid waste landfills
- ◆ Clean Air Act programs to reduce ozone pollution and nitrogen oxides emissions
- ◆ electric utility conservation incentives in the acid rain control program

CHAPTER 11

REDUCING RISKS FROM INDOOR AIR

Most people are aware that outdoor air pollution can damage their health but may not know that indoor air pollution can also have significant harmful effects. EPA studies indicate that indoor levels of many pollutants may be 2-5 times higher, and occasionally more than 100 times higher, than outdoor levels. Indoor pollutants are of particular concern because most people spend as much as 90 percent of their time indoors.

The two indoor pollutants posing the greatest risks are second-hand tobacco smoke and radon. Radon, a naturally occurring radioactive gas, is second only to smoking as a cause of lung cancer in the United States, resulting in an estimated 7,000 to 30,000 deaths annually.

Other indoor pollutants of concern include asbestos from building materials; volatile organic compounds from household products like paints, pressed wood furniture, cleaners and solvents; combustion gases from kerosene heaters and unvented or improperly functioning gas and wood stoves; biological contaminants from wet building materials or unhygienic indoor conditions; and lead from old lead-based paint.

Exposure to indoor air pollutants is believed to have increased over the past several decades. The reasons include construction of more tightly sealed buildings, reductions in ventilation rates to save energy, use of synthetic building materials and furnishings, and use of chemically formulated personal care products, pesticides and household cleaners.

Comparative risk studies by EPA consistently have ranked indoor air pollution among the top five environmental risks to public health. EPA, in cooperation with other federal agencies and the private sector, has begun a concerted effort to better understand indoor air pollution and to reduce people's exposure in offices, homes, schools and other indoor environments.

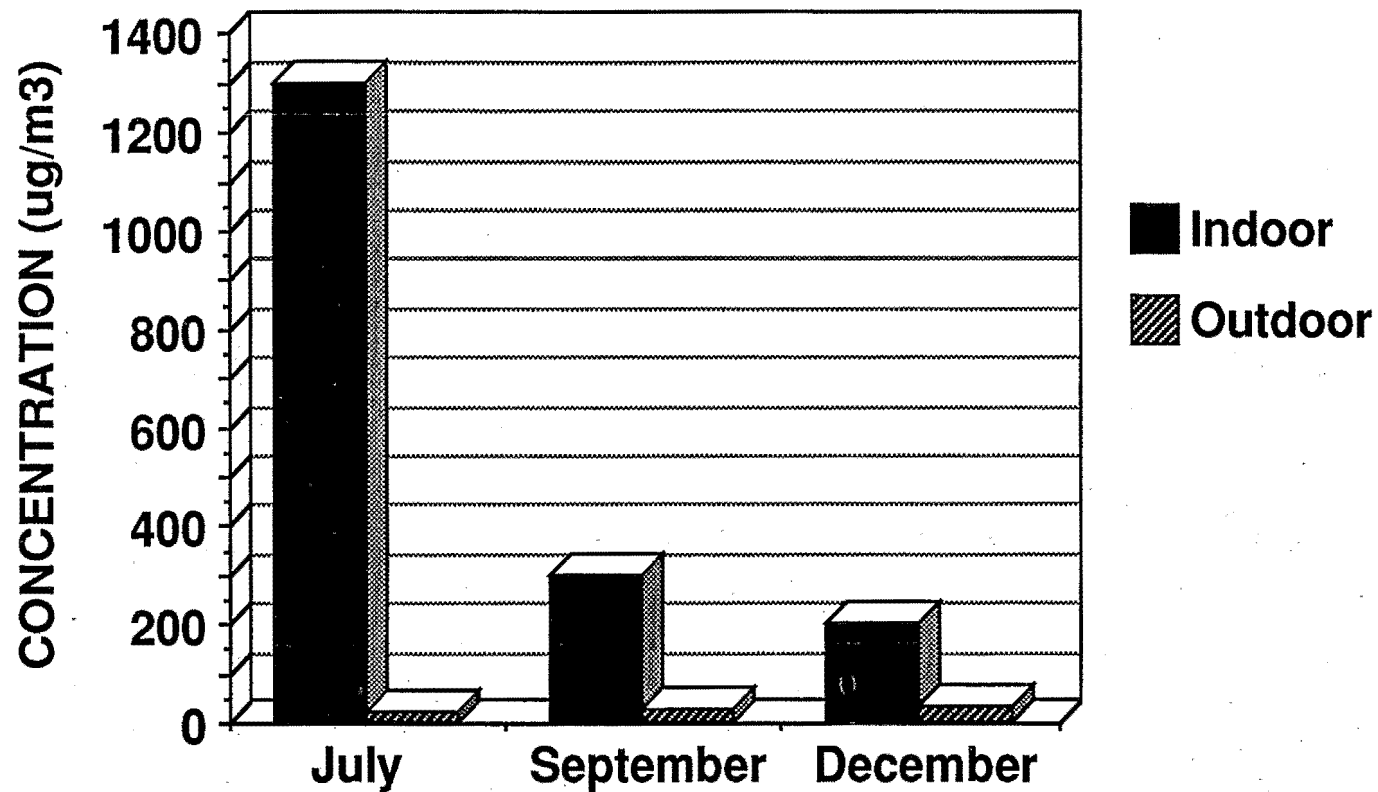
Many EPA offices are active on indoor air issues. The Office of Air and Radiation helps coordinate these efforts, as well as operating the Radon Action Program and developing information to provide guidance to a wide range of audiences. The following discussion highlights OAR's indoor air activities.

Advancing the Science

OAR is conducting studies to assess indoor air conditions in the nation's existing buildings. Another set of studies now underway is designed to evaluate the effectiveness and costs of key indoor air pollution control options for typical building structures.

EPA is preparing a report on the risk of lung cancer and other respiratory disorders associated with exposure to environmental tobacco smoke. The executive committee of EPA's Science Advisory Board has approved the report, which is under review by the EPA Administrator.

Total Organics in a New Office Building



Source: EPA 10 Bldg Study

Educating the Public and Governmental Officials

Many indoor air problems can be easily prevented or fixed once the problem is recognized. EPA believes that providing easy access to information about indoor air pollution sources and solutions will help lower people's exposure to indoor pollutants that may jeopardize their health.

One major part of the public information effort is OAR's Indoor Air Quality Information Clearinghouse in Washington, D.C., which the public can call by toll-free number. Opened in October 1992, the clearinghouse offers citations and abstracts on more than 2,000 books, reports, newsletters and journal articles; an inventory of federal publications; and information on more than 150 government and non-governmental organizations in the indoor air quality field.

OAR has published information on ways to reduce exposure to indoor air pollutants through improving the way buildings are designed and operated. Noteworthy publications include the following:

- ◆ *Building Air Quality: A Guide for Building Owners and Facility Managers* -- results of a cooperative effort by EPA and the National Institute for Occupational Health and Safety -- is designed to help building owners and managers prevent "sick building syndrome" and other health-threatening indoor air pollution problems in public and commercial buildings.

- ◆ *The Inside Story: A Guide to Indoor Air Quality* is intended to help people identify and correct potential indoor air quality problems in their own homes.

OAR is developing additional guidance for school facility managers, new home builders, and architects and design engineers to acquaint them with current information on how to prevent or fix indoor air quality problems.

A training course has been developed to help building owners reduce indoor air risks. OAR also has developed an instructional course on indoor air pollution and a self-paced course to help state and local officials address indoor air problems.

Encouraging Voluntary Action by Industry

EPA recently completed a year-long "dialogue" with the carpet floor covering industries, unions, public interest groups, and other federal agencies to explore ways of reducing the emission of volatile organic compounds (VOCs) from new carpet, carpet cushion material and adhesives.

As a result of this voluntary process, the carpet industry agreed to test new materials for total VOC emissions and is exploring ways of lowering emissions of VOCs from carpet products. The industry, in cooperation with other dialogue participants, also has undertaken an extensive consumer education program on the way carpet products affect indoor air quality.

The carpet dialogue, which was led by the Office of Prevention, Pesticides and

Toxic Substances and participated in by OAR, is expected to lead to similar discussions with other industry groups.

Protecting People From Radon

Radon gas, produced by the decay of uranium in rock and soil, can collect in buildings by seeping through foundation cracks and around drainage pipes and sump pumps.

In 1988, EPA and the Surgeon General recommended that homes be tested for radon. That same year, Congress enacted the Indoor Radon Abatement Act, giving EPA authority for radon training, state grants, and other important efforts. The Act also established a national goal of achieving indoor levels of radon that are no greater than outdoor levels.

Since then, the Radon Action Program has made significant progress in reducing the public's health risks from radon:

Radon risk assessment. The Radon Program has worked closely with the National Academy of Sciences, the EPA Science Advisory Board, and other scientific organizations to refine understanding of radon health risks, including the incidence of lung cancer. EPA's National Residential Survey, completed in 1990, indicates that approximately 6 percent of U.S. homes have radon levels above the Agency action level of 4 pCi/L. The National School Survey, completed in 1992, found 2.7 percent of school rooms with short-term radon levels above 4 pCi/L.

Outreach. Since 1988, EPA has developed an extensive network of national public health, real estate, building, and consumer organizations to increase public awareness of radon and to motivate informed testing and mitigation. These cooperative partners have invested over \$100 million in their commitment to radon risk reduction. The American Lung Association, the Consumer Federation of America, the National and American Medical Associations, the National Association of Counties, the National Association of Home Builders, and many others have educated their members and developed active, innovative programs to address radon.

EPA has completed key public guidance documents, the revised *Citizen's Guide to Radon*, the *Consumer's Guide to Radon Reduction*, and draft model standards for radon-resistant new construction. EPA's four university-based Regional Radon Training Centers ensure that the latest information on radon measurement and mitigation is available to federal, state and local officials, and to the private sector.

State programs. Since 1990, EPA has provided over \$30 million in grants to states to assist the development of effective state radon programs. States have assessed the extent of their radon problem, educated their citizens, and worked with local governments and public health organizations to increase radon risk reduction.

Quality assurance. EPA recently has launched two proficiency programs to assess the ability of industry to provide reliable testing and mitigation services to

the public. The radon contractor evaluation program, begun in 1990, has listed more than 1,000 national and local contractors capable of designing and installing systems to reduce elevated levels of radon in buildings and homes. In 1991, EPA added the operator proficiency program, which evaluates the knowledge of individuals who test for radon. That program has performed more than 350 evaluations.

Environmental results. Public awareness of radon is now over 60 percent, approximately 9 percent of homes have been tested, and hundreds of thousands have been fixed. In addition, hundreds of thousands of new homes have been built with radon resistant features. These results compare well to the results of similar voluntary public health and safety programs, such as seat belt and drunk driving campaigns.

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CHAPTER 12

INFORMING THE PUBLIC: OUTREACH EFFORTS

The Clean Air Act Amendments include a mind-numbing array of complex, interwoven provisions that affect American business, the American public, and state and local governments. One of the great challenges for the Office of Air and Radiation has been to reach out to all affected parties and explain the requirements of the new Amendments.

To this end, the air office has developed a number of innovative outreach programs and products. These include telephone hotlines, interactive computer bulletin boards, public service announcements, national videoconferences, brochures, reports, and videos.

For example, in July 1992 EPA released a *Guide to the Clean Air Act for Small Business*. This sector of society will be broadly affected by many aspects of the Act, and many small businesses have limited resources available for gaining an understanding of the complexities of the regulatory process.

In November 1990 the agency held a four-hour national interactive videoconference to help small business understand the implications of the new Amendments. This was in addition to an annual national four-hour videoconference EPA held on the status of the Amendments in conjunction with the Air and Waste Management Association and the American Bar Association.

EPA has established a toll-free 800 number to help small businesses, citizens, and others understand the various provisions related to stratospheric ozone

depletion. Other hotlines provide information on subjects such as acid rain and control technologies. The agency operates a computer bulletin board that allows anyone in the United States or in the entire world to have immediate access to a variety of clean-air related information, including text of various documents, recently signed rules, model permits, emission factors, and policy guidance.

EPA has developed and distributed a series of learning tools that can be used to understand the complexities of the new Amendments. These include detailed and general summaries of the Amendments, brochures, citizen guides, slide presentations, and a number of public service announcements. The announcements cover a wide variety of subjects, including ways to reduce smog, hazards associated with woodsmoke, and alternatives to leaf burning. According to a survey by the American Lung Association, EPA public service announcements on smog have been shown in 254 markets in 49 states to an estimated audience of over 250 million people.

Finally, EPA is working with its regional offices to develop a strategy to help ensure that consensus-building and outreach efforts continue at the state and local levels as Clean Air Act programs are implemented over the next several years.

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CHAPTER 13

LOOKING TO THE FUTURE

The Office of Air and Radiation has started to address a number of issues that will be important to future implementation of the Clean Air Act. These include the following:

Cooperation and regulatory negotiation. OAR is convinced of the need to make maximum use of consensus-building approaches ranging from roundtable discussions to formal regulatory negotiations. OAR should assess its initial efforts using these approaches to see what lessons have been learned, and to determine the most effective way to use various consensus-building methods.

State programs. States play a critical role in implementing much of the Act. For example, states develop plans for bringing urban air quality into line with national standards, and run permit programs to translate the Act's mandates into specific pollution reduction requirements. EPA has worked hard on building a partnership with the states, but needs to reinforce those efforts and determine how best to help states carry out their difficult tasks under the Act.

Benefits analysis. Cost-benefit analysis is a pervasive, useful tool for compiling and comparing the consequences of policy alternatives. However, the human health and ecological benefits of pollution control are extraordinarily difficult to estimate in quantitative terms. As a result, quantitative cost-benefit analyses of environmental policies often underrepresent potential benefits relative to costs. EPA must continue to improve its ability to estimate the benefits of environmental protection.

Business opportunities. EPA is making important advances in understanding and communicating the relationships between economic growth and environmental protection. In the case of clean air, the Smith-Barney study "Business Opportunities," conducted in August 1992, demonstrated that expenditures on clean air produce economic opportunities and technology innovation in the air pollution control industry, in addition to ecological and health benefits.

EPA's extensive data base of clean air projects convincingly shows that the Clean Air Act has produced identifiable economic development and jobs in all areas of the country. This growth has come in industries such as pollution control equipment manufacturing, fuel additive manufacturing, and automotive repair. EPA also is conducting a "threatened plant" study to understand better adverse impacts that may be occurring and to learn how to minimize them.

Market-based approaches. EPA should continue to pursue clean air goals through use of economic incentives whenever possible. Economic incentives provide industry with flexibility and opportunities to save money, and also encourage technical innovations that are needed to meet air quality goals at reasonable cost.

The Agency should develop systems to ensure that market-based programs provide environmental results that are equivalent or better than traditional regulatory approaches. These programs

also must provide industry with flexibility on ways to comply. Greater flexibility will be possible as better monitoring schemes and better emissions inventories are developed. These tools enable regulators to ensure that environmental progress is made when innovative techniques are used to comply.

Budget and management. Implementing the Clean Air Act is a mammoth undertaking that -- among other things -- involves regulating tens of thousands of plants and businesses spread across the country, working with the 50 states, and regulating motor vehicles and fuels.

It is critical that EPA have the personnel and resources to work through the issues thoroughly and write clear rules and guidelines. If EPA does not do its job well, industries are left with many uncertainties - uncertainties that force those industries to incur significant added costs.

Tremendous strides already have been made toward providing state and EPA air programs with additional funding to carry out the 1990 Amendments. The permit program provides new revenues for state and local air programs. Funding for OAR has increased significantly during the past two years.

Energy. The Clean Air Act and national energy policy are closely intertwined. For example, the use of alternative fuels and clean fuels can displace significant amounts of imported oil. EPA's green programs are aimed primarily at making energy use more efficient. Energy consumption also is

directly affected by transportation control measures such as high-occupancy vehicle carpool lanes. Transportation planning decisions, such as construction of new roads, have important implications for air quality.

EPA and other federal and state agencies must coordinate implementation of the Clean Air Act with implementation of the new Energy Policy Act of 1992 and the Intermodal Surface Transportation Efficiency Act of 1991.

Nitrogen oxides. Emerging evidence is focusing greater attention on the importance of controlling NO_x, which contributes to formation of ozone pollution and acid rain, and also to eutrophication of estuarine waters.

Before the passage of the 1990 Amendments, emissions of nitrogen oxides had received scant attention at the national level. Only Los Angeles violated the national air quality standard for nitrogen dioxide.

The new law toughens motor vehicle tailpipe standards for NO_x, and requires new and existing industrial plants in ozone non-attainment areas to control NO_x. Also, the acid rain control program requires coal-fired utility power plants to meet NO_x emissions standards.

However, NO_x reductions mandated by the 1990 Act may not be sufficient to reduce regional ozone levels in the Northern or Southeastern United States, nor address the contribution of NO_x to nutrient loadings in the Chesapeake Bay and other estuaries. The Agency must identify and promote the most cost-

effective approaches for minimizing ozone effects and related environmental damage associated with NO_x emissions.

A 1991 report by the National Research Council, *Rethinking the Ozone Problem in Urban and Regional Air Pollution*, found that in many areas of the United States, greater control of nitrogen oxides is needed to combat ozone effectively. EPA analyses using the regional oxidant model support the same conclusion. In many cases, the council report says, NO_x controls may be more effective in reducing ozone levels than aggressive controls on volatile organic compounds. Cost-effective strategies for many areas may entail rethinking overall control strategies. The council report also suggests that research is needed to improve understanding of ozone formation and to evaluate the impacts of Clean Air Act control strategies as they are implemented.

Review of air quality standards. Another critical set of science and policy issues concerns the re-evaluation of the ozone and fine particulate air quality standards. Both of these standards will be revisited in the coming years, and in both cases significant new data will need to be considered.

Risk and air toxics. The 1990 Amendments establish a two-phased program to reduce toxic air pollution. In the first phase, maximum achievable control technology is required on plants that are major sources of air toxics. After MACT controls are installed, EPA is to assess remaining health and environmental risks and, if certain criteria are met, issue more stringent "residual risk" standards.

Underway are several reviews of the way EPA measures risks from air toxics. For example, the National Academy of Sciences is studying EPA's methodology for assessing cancer risks from hazardous air pollutants, and will be suggesting improvements. It is important for EPA to determine how to incorporate the results of these assessments into the residual risk phase of the air toxics program.

Emissions inventories and data. Sound emissions inventories are essential to states' efforts to develop and implement effective strategies for cleaning the air. Good inventories also are needed to support effective market-based emissions averaging, banking and trading programs. EPA must see that states carry out reliable emissions inventories, and must put priority on obtaining good emissions data for its own programs.

Federal implementation plans. Court decisions may require EPA to develop and implement federal implementation plans to achieve cleaner air in several metropolitan areas, including Los Angeles. This effort could require tremendous use of OAR resources and require dramatic restructuring of current air programs. OAR needs to find a way to ensure that work on federal implementation plans does not undercut other air program efforts by draining away resources.

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APPENDIX I

FEDERAL REGISTER NOTICES ISSUED SINCE ENACTMENT OF THE 1990 AMENDMENTS

Following is a list of proposed and final air program rules and guidance published in the Federal Register since enactment of the Clean Air Act Amendments of 1990. Other significant air program Federal Register notices also are included.

<u>Notice</u>	<u>Date Published</u>
Vehicle Inspection and Maintenance Requirements (Notice of Final Rule)	November 5, 1992
Standards for Emissions from Natural Gas-Fueled and Liquified Petroleum Gas-Fueled Motor Vehicles and Motor Vehicle Engines, and Certification Procedures for Aftermarket Conversion Hardware (Notice of Proposed Rule)	November 5, 1992
Technical Guidance Documents for Particulate Matter (Notice announcing availability of three technical guidance documents for control of PM-10 emissions from fugitive dust, residential wood, and prescribed burning)	November 3, 1992
State Implementation Plans for Nonattainment Areas for Sulfur Dioxide (Notice announcing findings of failure to submit required SIPs)	October 27, 1992
Air Quality; Revision to Definition of Volatile Organic Compounds (Notice of Proposed Rule)	October 26, 1992
Oxygenated Fuels Labeling Regulations Under Section 211(m) of the CAA as Amended (Notice of Final Rulemaking)	October 20, 1992
Regulation of Fuel & Fuel Additives; Administrator's Finding That No Control or Prohibition on Maximum Oxygen Content of a Winter Oxygenated Gasoline Program is Necessary Under Section 211(c)(4)(A) of the CAA as Amended (Notice of Proposed Finding)	October 20, 1992
Guidelines for Oxygenated Gasoline Credit Programs <u>and</u> Guidelines on Establishment of Control Periods Under Section 211(m) of the CAA as Amended (Notice of Availability of Guidance Documents)	October 20, 1992

Notice**Date Published**

Regulation of Fuels & Fuels Additives; Standards for Reformulated Gasoline (Notice of application for extension of the Reformulated Gasoline Program to the Dallas/Fort Worth area in the State of Texas)

October 8, 1992

Clean Air Act; Acid Rain Provisions (Notice of delegation of administration of auctions & sales under section 416 of the CAA from the Administrator of EPA to the Chicago Board of Trade)

October 7, 1992

Approval & Promulgation of Implementation Plans; Appendix M, Addition of Method for Measurement of Opacity Emissions From Stationary Sources (Notice of Proposed Rule & Notice of Public Hearing)

October 7, 1992

Ambient Air Quality Surveillance Regulations (Notice of Proposed Rulemaking)

October 6, 1992

Fuels & Fuel Additives; (Notice of Waiver Application from Lubrizol Corporation for Diesel Additive Labeled EZ-ADDtm)

October 5, 1992

Clean Air Act; Contractor Access to Confidential Business Information (Notice)

October 5, 1992

National Emission Standards for Hazardous Air Pollutants for Source Categories: Perchloroethylene Emissions from Dry Cleaning Facilities (Notice of Availability of New Information)

October 1, 1992

Standards of Performance for New Stationary Sources; Calcines & Dryers in Mineral Industries (Notice of Final Rule)

September 28, 1992

Criteria for Exercising Discretionary Sanctions Under Title I of the Clean Air Act (Notice of Proposed Rule)

September 28, 1992

National Emission Standards for Hazardous Air Pollutants; Draft Schedule for the Promulgation of Emission Standards (Notice of Availability)

September 24, 1992

Clean Air Act; Contractor Access to Confidential Business Information (Notice of Intent to Transfer Info to Subcontractor)

September 23, 1992

Designations of Areas for Air Quality Planning Purposes (Notice of Proposed Rule)

September 22, 1991

Notice**Date Published**

Hazardous Waste Treatment, Storage, and Disposal Facilities Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers (Notice of Data Availability)

September 18, 1992

National Emission Standards for Hazardous Air Pollutants (Notice of Proposed Rule to Stay the Effectiveness of Subpart I of 40CFR60 as it is applied to Facilities Other Than Commercial Nuclear Power Reactors Licensed by NRC)

September 18, 1992

National Emission Standards for Hazardous Air Pollutants; Compliance Extensions for Early Reductions (Notice of Complete Enforceable Commitments Received Through 7/31/92)

September 17, 1992

Outer Continental Shelf Air Regulations (Notice of Final Rule)

September 4, 1992

Clean Air Act; Contractor Access to Confidential Business Information (Notice of Intent to Transfer Info to Subcontractor)

September 1, 1992

Notice of Decision Regarding Waiver Preemption for California's Methanol Vehicle Regulations

August 25, 1992

Notice of Decision Regarding Waiver Preemption for California's Amendment to its Warranty Statute & Regulations

August 25, 1992

Transportation and Air Quality Planning Guidelines

August 18, 1992

Clean Air Act; Contractor Access to Confidential Business Information (Notice of Intent to Transfer Info to Subcontractor)

August 10, 1992

National Ambient Air Quality Standards for Ozone (Proposed Decision Not to Revise)

August 10, 1992

National Emission Standards for Hazardous Air Pollutants; Compliance Extensions Early Reductions (Notice of Complete Enforceable Commitments Received)

August 3, 1992

Protection of Stratospheric Ozone; Final Rule (Implements the 1992 and later requirements of section 604 -- the phaseout of Class I ozone depleting substances -- as well as the related provisions of sections 603, 607 and 616)

July 30, 1992

Notice**Date Published**

Vehicle Inspection and Maintenance Requirements for State Implementation Plans (Notice of Availability of Regulatory Text, Location of Public Hearing Site & Correction of Proposed Rule)

July 28, 1992

Operating Permit Program (Notice of Final Rule)

July 21, 1992

Requirements for Preparation, Adoption and Submittal of Implementation Plans; Approval & Promulgation of Implementation Plans; and Standards of Performance for New Stationary Sources (WEPCO) (Notice of Final Rule)

July 21, 1992

California State Motor Vehicle Pollution Control Standards; Opportunity for Written Comments on Additional Information Submitted to the Public Docket of the Low-Emission Vehicle Stds Waiver Request

July 21, 1992

Diesel Fuel Sulfur Content Petition for Exemption (Notice of Final Decision)

July 20, 1992

Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines; Interim Regulations for Cold Temperature Carbon Monoxide Emissions from 1994 and Later Model Year Gasoline-Fueled Light-Duty Vehicles and Light-Duty Trucks (Notice of Final Rule)

July 17, 1992

Draft Lead and Particulate Matter Addendum to the General Preamble for Title I of the CAA Amendments of 1990 and Staff Work Products Providing Technical Guidance for PM-10 Best Available Control Measures (Notice announcing availability of documents and of public meeting)

July 16, 1992

Initial List of Categories of Source under Section 112(c)(1) of the CAA Amendments

July 16, 1992

Diesel Fuel Sulfur Content; Petition for Exemption from American Samoa (Notice of Final Decision)

July 15, 1992

Protection of Stratospheric Ozone; Standards and Requirements for Servicing of Motor Vehicle Air Conditioners (Notice of Final Rule)

July 14, 1992

Vehicle Inspection and Maintenance Requirements for State Implementation Plans (Notice of Proposed Rule)

July 13, 1992

Notice**Date Published**

Standards of Performance for New Stationary Sources; Appendix A Reference Methods; Amendments to Method 24 for the Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Source Coatings (Notice of Final Rule)

July 10, 1992

Acid Rain Allowance Allocations and Reserves (Notice of Proposed Rule)

July 7, 1992

Acid Rain Provisions (Notice of Availability; Final Version of the National Allowance Data Base (NADBV 2.1) and Accompanying Technical Support Documents)

July 7, 1992

Motor Vehicle and Engine Compliance Fees for: Light-Duty Vehicles and Trucks; Heavy-Duty Vehicles & Engines; and Motorcycles (Notice of Final Rule)

July 7, 1992

California State Motor Vehicle Pollution Control Standards; Waiver of Federal Preemption, Decision

June 11, 1992

Standards of Performance for New Stationary Sources; Appendix A Test Method 26 (Final Rule; Correcting Amendment)

June 10, 1992

Regulation of Fuels and Fuels Additives Standards for Reformulated Gasoline (Notice of Application for Extension of Reformulated Gasoline Program to the District of Columbia)

June 5, 1992

National Emission Standards for Hazardous Air Pollutants; National Emission Standards for Radon Emissions from Phosphogypsum Stacks (Notice of Final Rule)

June 3, 1992

Control of Pollution from New Motor Vehicles and New Motor Vehicle Engines; Nonconformance Penalties for Heavy-Duty Engines & Heavy-Duty Vehicles, Including Heavy Light-Duty Trucks (Notice of Proposed Rule)

May 29, 1992

Final Documents; Information Regarding the Formulation and Emission Reduction Potential of Transportation Control Measures (Notice of Availability)

May 29, 1992

Regulation of Fuels and Fuels Additives Standards for Reformulation and Conventional Gasoline (Proposed Rule; Relocation and Rescheduling of Public Hearing and Extension of Comment Period)

May 28, 1992

National Emission Stds for Hazardous Air Pollutants Benzene Waste Operations (Correction to Proposal)

May 20, 1992

Notice

Date Published

National Emission Stds for Hazardous Air Pollutants; Compliance Extensions for Early Reductions (Notice of Complete Enforceable Commitments Received)

May 15, 1992

Approval of Colorado's Petition to Relax the Federal Reid Vapor Pressure Volatility Stds for Colorado in 1992 and 1993 (Notice of Proposed Rule)

May 12, 1992

Colorado Petition to Relax Colorado Reid Vapor Pressure Volatility Stds (Temporary Direct Final Rule)

May 12, 1992

State Implementation Plans for Nonattainment Areas for Particulate Matter (Notice Announcing Findings of Failure to Submit Required State Implementation Plans)

May 8, 1992

Regulation of Fuels and Fuel Additives: Standards for Highway Diesel Fuel Quality-Sulfur Content; and Control of Air Pollution from New Motor Vehicles & New Motor Vehicle Engines: Standards for Oxides of Nitrogen Emissions from Heavy-Duty Diesel Engines, & Correction of Type 2-D Diesel Test Fuel Specification for Light-Duty Vehicles, Light-Duty Trucks & Heavy-Duty Engines (Notice of Final Rule)

May 7, 1992

Protection of Stratospheric Ozone; Labeling of Products using Ozone-Depleting Chemicals (Notice of Proposed Rule)

May 4, 1992

Control of Air Pollution from New Motor Vehicles & New Motor Vehicle Engines; Regulations for Light-Duty Vehicles and Light-Duty Trucks 1994 & 1995 Model Year Durability Testing Procedures & 1994 and Later Model Year Allowable Maintenance (Notice of Proposed Rule)

April 30, 1992

State Implementation Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990; Supplemental (Appendices to the Proposed General Preamble published 4/16/92)

April 28, 1992

Stratospheric Ozone Protection; Standards and Requirements Regarding the Servicing of Motor Vehicle Air Conditioners & Restrictions on the Sale of Small Containers of Class I or Class II Substances Pursuant to Section 609 of the CAA as Amended (Supplemental Proposed Rule)

April 22, 1992

Notice**Date Published**

Guidelines for Oxygenated Gasoline Waivers under Section 211(m)(3)(C) of the Clean Air Act as Amended (Notice of Availability of Guidelines)

April 17, 1992

State Implementations Plans; General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990

April 16, 1992

Regulation of Fuel and Fuel Additives; Standards for Reformulated and Conventional Gasoline (Notice of Proposed Rule)

April 16, 1992

Fuel and Fuel Additives Registration; Health & Emission Effects Testing Protocol (Notice of Proposed Rule)

April 15, 1992

Control of Air Pollution from New Motor Vehicles & New Motor Vehicle Engines; Refueling Emission Regs for Gasoline-Fueled Light-Duty Vehicles and Trucks and Heavy-Duty Vehicles; (Final Agency Action Pursuant to Section 202(a)(6) of the Clean Air Act Regarding Onboard Control of Refueling Emissions)

April 15, 1992

Control of Air Pollution from New Motor Vehicles & New Motor Vehicle Engines; Refueling Emission Regs for Gasoline-Fueled Light-Duty Vehicles and Trucks and Heavy-Duty Vehicles; (Notice notifies readers that because of EPA's final action involved in part the decision not to issue the rule initially proposed, that action is printed in the proposed rule section of the Federal Register)

April 15, 1992

Regulation of Fuels and Fuels Additives; Standards for Reformulated Gasoline (Notice of Application for Extension of Reformulated Gasoline Program to New Jersey, Delaware, and Maryland)

April 1, 1992

Clean Air Act; Contractor Access to Confidential Business Information (Notice of Intended Transfer of Confidential Business Information to Contractors)

March 27, 1992

Section 187 Vehicle Miles Traveled (VMT) Forecasting and Tracking Guidance (Notice of Availability)

March 19, 1992

Regulation of Fuels and Fuel Additives; Standards for Reformulated Gasoline (Notice of Application for Extension of Reformulated Gasoline Program to New York)

March 5, 1992

Notice**Date Published**

National Emission Standards for Hazardous Air Pollutants; Benzene Waste Operations (Notice of Final Rule -- Stays the effectiveness of subpart FF of 40CFR61 until final action is taken on clarifying amendments to subpart FF)

March 5, 1992

National Emission Standards for Hazardous Air Pollutants; Benzene Waste Operations (Notice of Proposed Rule -- Amendments to subpart FF designed to clarify provisions of the rule that have been widely misunderstood by affected sources)

March 5, 1992

Ambient Air Quality Surveillance; Enhanced Ozone Monitoring Regs (Notice of Proposed Rule)

March 4, 1992

Small Business Stationary Source; Technical & Environmental Compliance Assistance Program (Notice of Availability of Final Guidelines for Implementation of Section 507 of CAA as Amended)

February 5, 1992

Supplemental Notice of Proposed Guidelines for Oxygenated Gasoline Credit Programs under Section 211(m) of the CAA as Amended

February 5, 1992

Supplemental Notice of Proposed Guidance on Establishment of Control Periods under Section 211(m) of the CAA as Amended

February 5, 1992

Rules of Practice Governing the Administrative Assessment of Civil Penalties (Notice of Final Rule)

February 4, 1992

Requirements for Preparation, Adoption and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans (Notice of Final Rule)

February 3, 1992

Acid Rain Program; Change in Public Comment Period for the Core Rules

January 30, 1992

Fuel and Fuel Additives; Ethyl Corporation Waiver Application (EPA denied Ethyl's request for waiver for HITEC 3000)

January 22, 1992

Stratospheric Ozone Protection; Significant New Alternatives Policy (SNAP) Program (Request for Data and Advance Notice of Proposed Rule)

January 16, 1992

Notice**Date Published**

Stratospheric Ozone Protection; Ban Nonessential Products Releasing Class I Ozone-Depleting Substances & Require the Elimination of Emissions from Products Using Class I Substances under Sections 610 & 608 of the CAA, as Amended (Notice of Proposed Rule)

January 16, 1992

National Emission Standards for Coke Oven Batteries Pursuant to Section 112 of CAA, as Amended (Establishment of Advisory Committee and Notice of Open Meeting)

January 15, 1992

California State Motor Vehicles Pollution Control Standards (Notice of Opportunity for Public Hearings and Public Comment Period)

January 9, 1992

Final Ruling on Petition Submitted by the Governor of the Virgin Islands Pursuant to Section 324(a)(1) of the Clean Air Act

January 6, 1992

Final Report on the "Nonroad Engine and Vehicle Emission Study" (Notice of Availability)

January 6, 1991

NESHAPS for Radionuclides; Subpart T as applied to NRC-licensed Uranium Mill Tailings Disposal Sites (Final Rule to Stay the Effectiveness of 40 CFR Part 61)

December 31, 1991

NESHAPS for Radionuclides; Subpart T as applied to NRC-licensed Uranium Mill Tailings Disposal Sites (Proposal to Rescind 40 CFR Part 61)

December 31, 1991

Health and Environmental Standards for Uranium and Thorium Mill Tailings (ANPRM pursuant to the UMTRCA of '78 to amend its general environmental regs pertaining to Uranium Mill Tailings Disposal Sites at 40 CFR Part 192, Subpart D)

December 31, 1991

Protection of Stratospheric Ozone; 1991 Production and Consumption Restrictions of Ozone-Depleting Chemicals Required by Section 604 of the CAA Amendments of 1990 (Direct Final Amendment to the Temporary Final Rule)

December 30, 1991

Regulation of Fuels & Fuels Additives; Stds for Reformulated Gasoline (Notice of Application for Extension of the Reformulated Gasoline Program to Connecticut, New Hampshire & Virginia)

December 23, 1991

Notice

Date Published

National Emission Stds for Hazardous Air Pollutants; Polonium-210 Emissions from Elemental Phosphorus Plants (Notice of Final Rule)

December 19, 1991

Preparation, Adoption, and Submittal of State Implementation Plans: Method 202 for Measurement of Condensable Particulate Emissions from Stationary Sources (Notice of Final Rule)

December 17, 1991

Notice of EPA Request for Delegation Proposals to Administrator the Auctions & Direct Sale Under Section 416 of the CAA Amendments of 1990, and Request for Public Comment

December 17, 1991

Auctions, Direct Sales, & Independent Power Producers Written Guarantee Regulations (Notice of Final Rule)

December 17, 1991

Control of Air Pollution from New Motor Vehicles & New Motor Vehicle Engines: Evaporative Emissions Regs for Gasoline and Methanol-Fueled Light-Duty Vehicles and Light-Duty Trucks & Heavy-Duty Vehicles (Notice of Public Workshop and Report Availability)

December 17, 1991

Control Techniques Guideline Document: Reactor Processes and Distillation Operations in the Synthetic Organic Chemical Manufacturing Industry (Release of Draft Control Techniques Guideline (CTG) for Public Review)

December 12, 1991

Regulation of Fuels and Fuel Additives: Stds for Gasoline Volatility Phase II; and Control of Air Pollution from New Motor Vehicle Engines: Stds for Particulate Emissions from 1991 & 1992 Urban Buses (Notice of Final Rule)

December 12, 1991

National Emission Stds for Hazardous Air Pollutants Benzene Waste Operations (Notice of Proposal Rule to Stay Effectiveness of Subpart FF of 40 CFR Part 61)

December 9, 1991

Stds of Performance for New Stationary Sources; Perchloroethylene Dry Cleaners; Proposed Rule; Withdrawal

December 9, 1991

National Emission Stds for Hazardous Air Pollutants for Source Categories: Perchloroethylene Emissions from Dry Cleaning Facilities (Notice of Proposed Rulemaking & Notice of Public Hearing)

December 9, 1991

Outer Continental Shelf Air Regulations (Notice of Proposed Rulemaking)

December 5, 1991

Notice**Date Published**

Acid Rain Program: Permits, Allowance System,
Continuous Emissions Monitoring, and Excess Emissions
(Notice of Proposed Rulemaking)

December 3, 1991

Reclassification of Moderate PM-10 Nonattainment
Areas to Serious Areas (Notice of Proposed
Rulemaking)

November 21, 1991

Diesel Fuel Sulfur Content; Petition for Exemption for
American Samoa (Notice of Proposed Decision)

November 18, 1991

Regulation of Fuels and Fuel Additives (Notice of
Application for Extension of the Reformulated Gasoline
Program to Massachusetts & Pennsylvania)

November 15, 1991

Contractor Access to Confidential Business Information

November 14, 1991

California State Nonroad Engine and Vehicle Pollution
Control Standards; Authorization of State Standards;
California Primary Use Determination (Notice of an
Opportunity to Submit Written Comments)

November 8, 1991

State Implementation Plan Completeness Criteria
(Technical Correction)

November 8, 1991

NAAQS Attainment, Nonattainment, and Unclassified
Area Designations and Classifications (Notice of Final
Rulemaking)

November 6, 1991

Revise Gas Guzzler Tax Statement on Fuel Economy
Label (Direct Final Rule)

October 28, 1991

Draft Documents; Information Regarding the
Formulation and Emission Reduction Potential of
Transportation Control Measures (Notice of Availability)

October 28, 1991

NESHAPs for Radionuclides; Subpart T as Applied to
NRC-licensed Uranium Mill Tailings Disposal Sites
(Proposal to Stay the Effectiveness of 40 CFR Part 61)

October 25, 1991

Approval and Promulgation of Air Quality
Implementation Plans; Massachusetts; Denial of Petition
for Reconsideration; Disapproval of Compliance Date
Extension for Automobile Surface Coating (Notice of
Denial of Petition for
Reconsideration)

October 23, 1991

State Implementations for Nonattainment Areas for
Ozone (Notice of Finding of Failure to Submit a
Required SIP and Proposed Rule)

October 22, 1991

Notice**Date Published**

Volatility Regulations for Gasoline and Alcohol Blends
(Notice of Proposed Rulemaking)

October 18, 1991

Protection of Stratospheric Ozone Phaseout of the
Production and Consumption of Class I Substances that
Deplete the Ozone Layer (Notice of Proposed
Rulemaking Correction)

October 8, 1991

Protection of Stratospheric Ozone 1991 Limits on
Production and Consumption of Ozone-Depleting
Chemicals in Section 604 (Notice of Direct Final
Amendment to the Temporary Final Rule)

October 8, 1991

Requirements for Clean Fuel Fleet Credit Programs,
Transportation Control Measures Exemptions, and for
Federal Fleets (Notice of Proposed Rulemaking)

October 3, 1991

Approval and Promulgation of Implementation Plan:
Revision of the Visibility FIP for Arizona (Notice of
Final Rulemaking)

October 3, 1991

Protection of Stratospheric Ozone Phaseout of the
Production and Consumption of Class I Substances that
Deplete the Ozone Layer (Notice of Proposed
Rulemaking)

September 30, 1991

Air Programs; Credit Program for California Pilot Test
Program; (Notice of Proposed Rulemaking)

September 25, 1991

Control of Air Pollution from New Motor Vehicles and
New Motor Vehicle Engines: Particulate Emission
Regulations for '93 Model Year Buses, Particulate
Emission Regs for '94 & Later Model Year Urban
Buses, Retrofit/Rebuild Requirements for '93 & Earlier
Model Year Urban Buses; and Oxides of Nitrogen
Emission Regs for 1998 and Later Model Year Heavy-
Duty Engines (Notice of Proposed Rulemaking)

September 24, 1991

Air Pollution Control; New Motor Vehicles and
Engines: On-Board Diagnostic Systems on 1994 and
Later Model Year Light-Duty Vehicles and Light Duty
Trucks; (Notice of Proposed Rulemaking)

September 24, 1991

National Emission Standards for Hazardous Air
Pollutants; Amendment to Benzene Rule for Coke By-
Product Recovery Plants (Notice of Final Rulemaking)

September 19, 1991

Asbestos NESHAP Training Requirements for On-Site
Representative (Notice of Guidance)

September 12, 1991

Notice**Date Published**

National Emission Standards for Hazardous Air Pollutants; Polonium 210 Emissions from Elemental Phosphorus Plants (Notice of Proposed Rulemaking)

September 11, 1991

Regulation of Fuels and Fuel Additives: Standards for Reformulated Gasoline (Notice of Application for Extension of the Reformulated Gasoline Program to Maine)

September 10, 1991

Stratospheric Ozone Protection Advisory Committee; Renewal

September 9, 1991

Waiver of Preemption to California for Nonroad Engine and Vehicle Standards (Notice of Proposed Rulemaking)

September 6, 1991

California State Nonroad Engine and Vehicle Pollution Control Standards; Authorization of State Standards; (Proposed Decision of the Administrator; Opportunity for Public Hearing)

September 6, 1991

Protection of Stratospheric Ozone; Servicing of Motor Vehicle Air Conditioners (Notice of Proposed Rulemaking)

September 4, 1991

Draft 1991 Transportation-Air Quality Planning Guidelines (Notice of Availability)

September 4, 1991

Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines; Refueling Emission Regs for Gasoline-Fueled Light-Duty Vehicles & Trucks and Heavy-Duty Vehicles (Notice of Public Hearing and Report Availability)

September 3, 1991

Procedures Document for Establishing Emissions from Sources of Hazardous Air Pollutants (Notice of Draft Document Availability; Request for Public Comment)

August 27, 1991

Air Pollution Control; Motor Vehicle Emission Factors (Notice of Availability of Revised Highway Motor Vehicle Emission Factor Model (MOBILE4.1))

August 26, 1991

State Implementation Plan Completeness Criteria (Notice of Final Rulemaking)

August 26, 1991

Fuel Economy Retrofit Device Evaluation for the Platinum Gasaver (Notice of Fuel Economy Retrofit Device Evaluation)

August 16, 1991

Approval and Promulgation of Implementation Plans; Revision of the Visibility FIP for Arizona (Supplemental Notice Requesting Comment)

August 13, 1991

Notice**Date Published**

Regulation of Fuels and Fuel Additives: Standards for Reformulated Gasoline (Notice of Application for Extension of the Reformulated Gasoline Program to Rhode Island)

August 13, 1991

Designations and Classifications for Initial PM-10 Nonattainment Areas (Notice correcting EPA's announcement of the designations and classifications for the initial PM-10 (particulate matter nominally 10 microns or smaller in diameter) nonattainment areas)

August 8, 1991

Proposed Rule to Rescind 40 CFR Part 61 Subpart I for Nuclear Power Reactors (Radionuclide NESHAP)

August 5, 1991

Final Rule to Stay Subpart I of 40 CFR Part 61 as it Applies to Nuclear Power Reactors (Radionuclide NESHAP)

August 5, 1991

Volatility Regulations for Gasoline and Alcohol Blends Sold in Calendar Year 1991; Northeastern Arizona (Notice of Final Rulemaking)

August 2, 1991

Fuels and Fuel Additives; MMT Waiver Application

August 1, 1991

Rules of Practice Governing the Administrative Assessment of Civil Penalties Under the Clean Air Act (Notice of Proposed Rulemaking)

July 22, 1991

Organic Air Emission Standards for Hazardous Waste Treatment, Storage and Disposal Facilities (TSDF): Tanks, Surface Impoundments, and Containers (Notice of Proposed Rulemaking)

July 22, 1991

Regulations for Registration of Lead Substitute Gasoline Additives to Reduce Valve Seat Wear (Notice of Proposed Rulemaking)

July 19, 1991

National Allowance Data Base, Version 2.0; Acid Rain Provisions (Notice of Availability)

July 19, 1991

Regulation of Fuels and Fuel Additives: Standards for Highway Diesel Fuel Quality-Sulfur Content; and Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines: Standards for Oxides of Nitrogen Emissions from Heavy-Duty Diesel Engines (Notice of Proposed Rulemaking)

July 17, 1991

<u>Notice</u>	<u>Date Published</u>
Oxygenated Fuels Labeling Regulations Under Section 211(m) of the Clean Air Act as Amended (Notice of Proposed Rulemaking)	July 9, 1991
Guidance on Establishment of Control Periods Under Section 211(m) of the Clean Air Act as Amended (Notice of Proposed Guidance)	July 9, 1991
Guidelines for Oxygenated Gasoline Credit Programs Under Section 211(m) of the Clean Air Act as Amended (Notice of Proposed Guidelines)	July 9, 1991
Regulation of Fuels and Fuel Additives; Standards for Reformulated Gasoline (Notice of Proposed Rule)	July 9, 1991
Protection of Stratospheric Ozone (Temporary Final Rule; Correction)	July 8, 1991
Guidelines Establishing Test Procedures for the Analysis of Pollutants; Identification and Listing of Hazardous Waste; Test Methods (Notice of Proposed Rule and Request for Comments)	July 3, 1991
Motor Vehicle and Engine Compliance Program Fees for: Light-Duty Vehicles; Light-Duty Trucks; Heavy-Duty Vehicles and Engines; and Motorcycles (Notice of Proposed Rulemaking)	July 1, 1991
Fossil Fuel-Fired Utility Steam Generating Units; Acid Rain Provisions (Notice of Availability)	June 25, 1991
Preliminary Draft List of Categories and Subcategories Under Section 112 of the Clean Air Act (Notice of Availability and Request for Information)	June 21, 1991
Applicability of New Source Review and New Source Performance Standards at Electric Utility Sources (WEPCO) (Notice of Proposed Rulemaking)	June 14, 1991
General Preamble for Title I of the CAA Amendments (Draft Document Available & Public Meeting)	June 13, 1991
NESHAP Compliance Extensions for Early Reduction of Hazardous Air Pollutants (Notice of Proposed Rulemaking)	June 13, 1991
Waiver of Federal Preemption for Amendments to California's Regs that Establish Stds & Certification Procedures for Methanol-Fueled Vehicles & Engines & Heavy-Duty Engines Fueled by Compressed Natural Gas of Liquid Petroleum Gas	June 11, 1991

Notice**Date Published**

National Air Pollution Control Techniques Advisory
Committee Request for Suggestions for List of
Candidates

June 7, 1991

Control of Air Pollution from New Motor Vehicles and
New Motor Vehicle Engines: Gaseous and Particulate
Emission Regulations for 1994 and Later Model Year
Light-Duty Vehicles and Light Duty Trucks (Notice of
Final Rulemaking)

June 5, 1991

Revision of Phase I Volatility Regs for Gasoline;
Northeastern Arizona (Notice of Proposed Rulemaking)

May 30, 1991

NSPS Municipal Solid Waste Landfills (Notice of
Proposed Rulemaking)

May 30, 1991

Regulation of Fuels & Fuels Additives; Definition of
Substantially Similar (Advanced Notice of Proposed
Rulemaking)

May 30, 1991

Regulations of Fuels & Fuel Additives Stds for Gasoline
Volatility (Notice of Proposed Rulemaking)

May 29, 1991

Urban Bus Particulate Matter Std for Model Years 1991
to 1992 (Notice of Proposed Rulemaking)

May 29, 1991

State Implementation Plan Completeness Criteria
(Notice of Proposed Rulemaking)

May 24, 1991

Auctions, Direct Sales & Independent Power Producers
Written Guarantee Regs (Notice of Proposed
Rulemaking)

May 23, 1991

NESHAP Radon Emissions from Phosphogypsum Stacks
(Notice of Compliance Waiver)

May 22, 1991

Operating Permit Program (Notice or Proposed Rule;
Notice of Opportunity for Public Hearing)

May 10, 1991

Volatility Regs for Gasoline & Alcohol Blends Sold in
Calendar Year 1991; State of Texas (Notice of Proposed
Rulemaking)

May 6, 1991

Stay of Subpart I of CFR Part 61 Radionuclide
Emissions (Final Rule)

April 24, 1991

Preparation, Adoption, & Submittal of SIPS; PM-10,
Sulfur Dioxide, & Lead Nonattainment & Unclassifiable
Area Designations (Information Notice)

April 22, 1991

Control of Air Pollution Motor Vehicle Engines;
Federal Certification Test Results for 1991 Model Year

April 15, 1991

Notice**Date Published**

Request for Information Concerning Heavy-Duty Engine Rebuild (Notice, Request for Information)

April 4, 1991

Regulation of Fuels and Fuel Additives (Direct Final Rule)

April 4, 1991

National Emission Standards for Hazardous Air Pollutants; Amendment to Benzene Rule for Coke By-Product Recovery Plants (Notice of Proposed Rulemaking)

April 1, 1991

Requirements for Preparation, Adoption and Submittal of Implementation Plans; Approval and Promulgation of Implementation Plans (Notice of Proposed Rulemaking)

March 18, 1991

Air Quality: Revision to EPA Policy Concerning Ozone Control Strategies and Volatile Organic Compound Reactivity (Notice of Revised EPA Policy Statement)

March 18, 1991

Notice Announcing Designation and Classifications for Initial PM-10 Nonattainment Areas

March 15, 1991

National Emission Standards for Hazardous Air Pollutants -- NRC-Licensed Facilities (Advance Notice of Proposed Rulemaking)

March 13, 1991

National Emission Standards for Hazardous Air Pollutants -- NRC-Licensed Facilities (Notice of Proposed Rulemaking)

March 13, 1991

National Emission Standards for Hazardous Air Pollutants -- NRC-Licensed Facilities (Order Temporarily Staying Effective Date)

March 13, 1991

Notice of Availability of Guidance and Submittal Forms for Elections under Sections 405(d)(3), 405(d)(4), and 405(g)(2) of the Clean Air Act Amendments of 1990

March 12, 1991

Protection of the Stratospheric Ozone; Regulations to Implement the 1991 Limits on the Production and Consumption of Ozone-Depleting Chemicals Required by Section 604 of the Clean Air Act Amendments of 1990 (Temporary Final Rule)

March 6, 1991

Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines: Gaseous and Particulate Emission Regulations for 1994 and Later Model Year Light-Duty Vehicles and Light-Duty Trucks (Notice of Proposed Rulemaking)

March 7, 1991

Notice**Date Published**

New Source Performance Standards: Standards of Performance for Polypropylene, Polyethylene, Polystyrene, and Poly(ethylene Terephthalate) Manufacturing Industry (Final rule; Correction)

March 5, 1991

National Emission Standards for Hazardous Air Pollutants Announcement of Negotiated Regulation for Equipment Leaks (Notice of Agreement on Negotiated Regulation)

March 4, 1991

Fuel Economy Test Procedures: Alternative-Fueled Economy Labeling Requirements (Notice of Proposed Rulemaking)

March 1, 1991

Notice of Fifth Conference on Air Quality Modeling

February 25, 1991

Disclosure of Emission Data Claimed as Confidential Under Section 110 and 114(c) of the Clean Air Act (Notice of Policy on Public Release of Certain Emission Data Submitted Under Sections 110 and 114(c) of the Clean Air Act)

February 21, 1991

National Emission Standards for Hazardous Air Pollutants: NRC-Licensed Facilities (Notice of Proposed Rule)

February 15, 1991

Requirements for Preparation, Adoption, and Submittal of Implementation Plans -- Augmentation of Guidelines on Air Quality Models (Notice of Proposed Rulemaking)

February 13, 1991

Standards of Performance for New Stationary Sources Addition of Methods for Measurement of Polychlorinated Dibenzo-p-Dioxins, Polychlorinated Dibenzofurans, and Hydrogen Chloride Emissions from Stationary Sources (Notice of Final Rulemaking)

February 13, 1991

Standards of Performance for New Stationary Sources Addition of Performance Specification 4A to Appendix B and Revision of Procedure 1 of Appendix F (Notice of Final Rulemaking)

February 11, 1991

Emission Guidelines: Municipal Waste Combustors (Final Emission Guidelines)

February 11, 1991

Standards of Performance for New Stationary Sources: Municipal Waste Combustors (Notice of Final Rulemaking)

February 11, 1991

Notice**Date Published**

Approval and Promulgation of Implementation Plans
Revision of the Visibility FIP for Arizona (Notice of
Proposed Rulemaking and Announcement of Public
Hearing)

February 8, 1991

Standards of Performance for New Stationary Sources
Amendments to Subpart J (Petroleum Refineries) and
Addition of Performance Specification 7 to Appendix B
(Final Rule; Correction)

February 4, 1991

Revised Interpretive Rule; Regulation of Fuels and Fuel
Additives; Definition of "Substantially Similar" (Notice of
Final Rulemaking)

February 1, 1991

Performance Warranty Regulations and the Voluntary
After market Part Certification Program: Supplemental
Proposed Alternative Test Procedure (Supplemental
Notice of Proposed Rulemaking)

January 30, 1991

Notice Listing Ozone-Depleting Substances (Initial Lists)

January 1, 1991

Fuels and Fuel Additives; Waiver Application (Notice)

December 20, 1990

Amendments to Standards of Performance for New
Stationary Sources; Reporting Requirements (Final
Rule)

December 13, 1990

Standards of performance for New Stationary Sources;
Polypropylene, Polyethylene, Polystyrene, and
Poly(ethylene terephthalate) Manufacturing Industry
(Final Rule)

December 11, 1990

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APPENDIX II

EPA STAFF ACCOMPLISHMENTS: CLEANING THE AIR AND REDUCING RISKS

The Office of Air and Radiation, in cooperation with other EPA offices, has performed thousands of valuable tasks between February 1989 and November 1992. The credit for these achievements must go first and foremost to the thousands of EPA employees who devoted their energies and intellects -- and, very often, extra hours -- to hundreds of rules, guidelines, studies, publications, and other projects. In recognition of this fact, this appendix lists the top accomplishments of each organizational unit of OAR. Also included are accomplishments of regional offices, the Office of General Counsel, and many other EPA offices that contributed to OAR efforts. These lists were developed by the employees themselves.

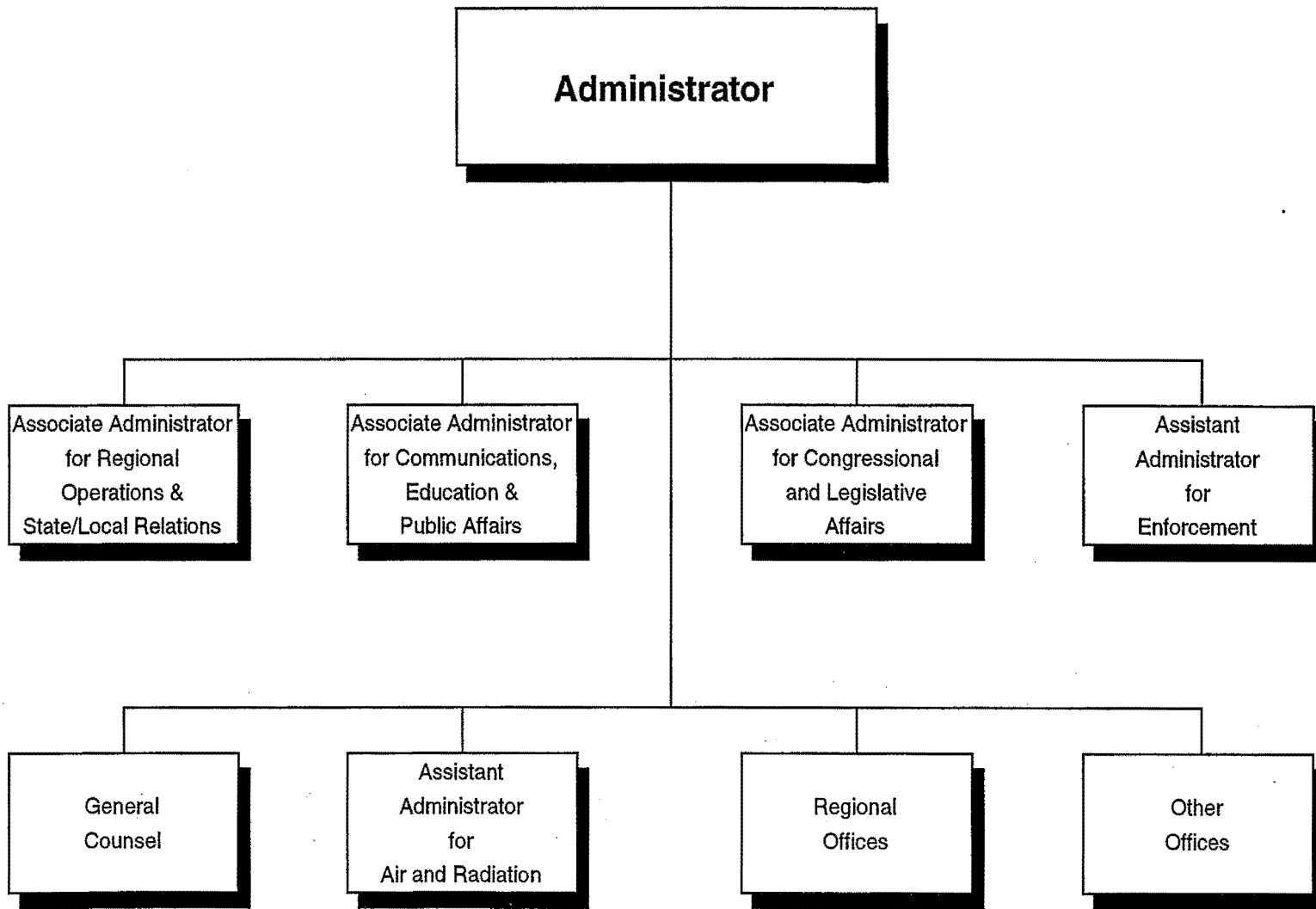
-- William G. Rosenberg
Assistant Administrator
for Air & Radiation

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U.S. Environmental Protection Agency



Office of Air and Radiation

Office of Program
Management
Operations

Office of Policy
Analysis & Review

Office of
Radiation and
Indoor Air

Radiation
Studies Division

Criteria and
Standards
Division

Radon
Division

Indoor Air
Division

Office of Radiation
and Indoor Air
(Las Vegas Facility)

National Air and
Radiation
Environmental Lab

Office of Air
Quality Planning
and Standards

Emission
Standards
Division

Air Quality
Management
Division

Technical
Support
Division

Stationary Source
Compliance
Division

Office of
Mobile Sources

Manufacturers
Operations
Division

Field
Operations and
Support Division

Engineering
Operations
Division

Certification
Division

Regulatory
Programs and
Technology

Regulation
Development and
Support Division

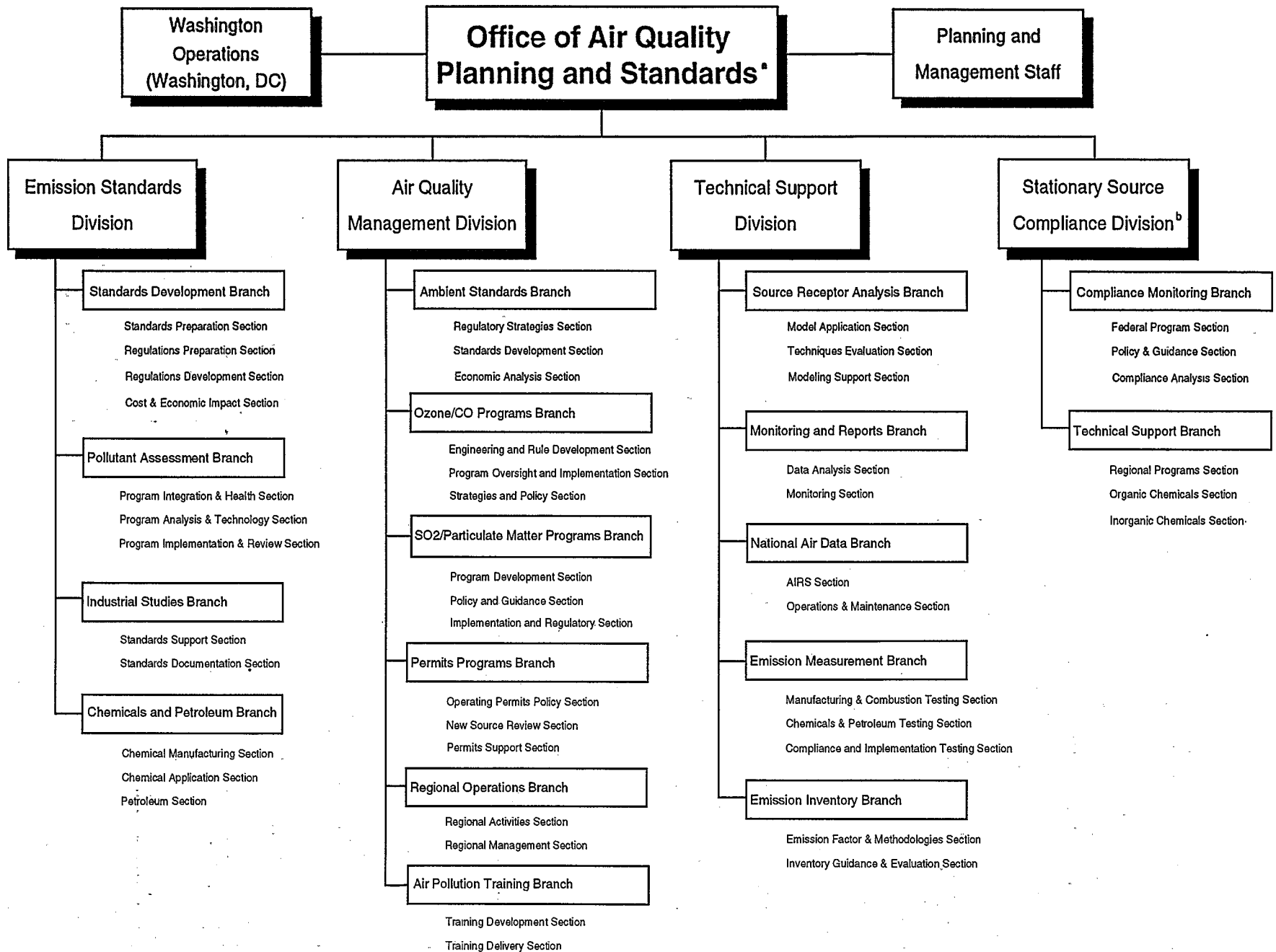
Emission Planning
and Strategies
Division

Office of
Atmospheric
Programs

Global
Change
Division

Stratospheric
Protection
Division

Acid Rain
Division



^a Unless otherwise indicated, all organizational units are located in North Carolina

^b All organizational units that compose this division are located in Virginia

OFFICE OF AIR QUALITY PLANNING AND STANDARDS

Emissions Standards Division

- ◆ Developed and put into operation a strategic plan to achieve the requirements and goals of Title III of the Clean Air Act Amendments of 1990. This comprehensive hazardous air pollutant program includes developing emission standards and conducting health and risk assessments, engineering and economic analyses on control strategies, and studies on key problems such as air toxics deposition into U.S. waters and urban air toxics levels.
- ◆ Provided special engineering and economic expertise for the development of Federal rules for new and existing stationary sources of six major pollutants, including the precursors of smog. The program also includes (1) developing control techniques guidelines and alternative control technology documents for State and local air pollution agencies to use in crafting their air pollution reduction strategies and plans, and (2) assisting state and local agencies and industry in identifying best available control technologies.
- ◆ Provided specialized technical expertise in the areas of engineering, toxicology, dispersion and exposure modeling, economics, and health and risk assessment in developing innovative, cost effective pollution reduction approaches including pollution prevention, assisting small businesses in complying with Clean Air Act requirements, and helping the general public to understand global and local air pollution problems.

Chemicals and Petroleum Branch

- ◆ Provided experienced and specialized engineering support to several major programs for reducing volatile organic compounds. These programs include the development of Federal rules under RCRA and the Clean Air Act, the preparation of detailed guidance documents for states to use in developing their rules, and case-by-case technical assistance to other governmental organizations and citizens who needed control technology information.
- ◆ Provided experienced and specialized engineering support in evaluating and identifying control technology options for the development of federal standards for toxic organic air emissions. In the process, the branch has developed information that it has shared with other government agencies and the public which has been used by them to understand toxic emissions and to develop control strategies.
- ◆ Instituted several programs which are integrated with other offices and which emphasize multi-media considerations. These include the development of air rules under RCRA, the preparation of guidance documents on the air aspects of Superfund implementation, the development of an air-water integrated rule for pulp and paper, participation and lead roles on three regulatory clusters, and participation in several source reduction/pollution prevention targeted projects.

Chemical Manufacturing Section

- ◆ Conducted the "Nine CEOs' Voluntary Emission Reduction Program". This was the first voluntary emission reduction effort and demonstrated the concepts used in the "33/50" and "Hazardous Air Pollutants Early Reduction" programs. 1990 through 1992.
- ◆ Published list of major and area source categories emitting hazardous air pollutants required under Section 112. July 16, 1992.
- ◆ Promulgated New Source Performance Standards for air oxidation processes and distillation operations in the synthetic organic chemical manufacturing industry. June 29, 1990.

Petroleum Section

- ◆ Published proposed rule to control and monitor air emissions hazardous waste treatment, storage and disposal facilities under the Resource Conservation and Recovery Act. July 22, 1991.
- ◆ Developed an integrated rulemaking for hazardous air pollutants in the pulp and paper industry. August 1992.
- ◆ Developed guidance for the control of emissions of volatile organic compounds from gasoline service stations (Stage II) and conducted training courses for EPA Regional and State and local air pollution agency personnel at several different sites. 1991 through 1992.

Chemical Application Section

- ◆ Provided expert witnesses who assisted the Department of Justice in collecting over \$2 million in penalties. 1990 through 1992.
- ◆ Initiated development of five maximum achievable control technology (MACT) standards for hazardous air pollutants under Section 112 and seven control techniques guidelines and standards for architectural and industrial coatings under Section 183. 1990 through 1992.
- ◆ Developed a method for directly measuring the efficiency with which a hood or other capture device collects the volatile organic emissions from an industrial process, a critical measurement for determining compliance with many air regulations. Published a report to help States and industry use the method: "The Measurement Solution: Using a Temporary Total Enclosure for Capture Efficiency Testing" EPA 450/4-91-020. April 1991.

Pollutant Assessment Branch

- ◆ Provided policy and technical expertise for developing a comprehensive strategy for implementing programs to address the U.S. hazardous air pollution problem. These efforts include studies on urban air toxics and air toxic deposition in the Great Lakes and other U.S. waters, and the development of the components of the regulatory agenda for the development of emission standards for hazardous air pollutants.
- ◆ Involved State and local air pollution agencies in all activities of the Emission Standards Division, especially those related to the hazardous air pollution provisions of the Clean Air Act. Sponsored highly successful workshops on risk assessment and state and local air toxics program implementation. Consulted extensively with state and local programs in the development of guidance under 112(g) [Modifications] and 112(l) [State Program Approval]. Worked with state and local air pollution agencies on transition issues and the identification of necessary implementation activities.
- ◆ Actively advanced and participated in the development of EPA policies to address risk assessment/management issues. This effort has included detailed interaction with the National Academy of Sciences' Committee on Risk Assessment of Hazardous Air Pollutants (CAPRA), the development of improved tools for risk assessment, the coordination of the efforts of Federal and State risk assessment and management experts, and the collection and dissemination of the latest work on risk assessment occurring at all levels of government.

Program Analysis & Technology Section

- ◆ Completed and transmitted a report describing EPA's risk assessment methods, past and present applications, and current issues to the National Academy of Sciences to assist the academy in its study of Agency risk methods. March 1992.
- ◆ Improved significantly EPA exposure modeling capabilities for air pollution emissions from industrial sources by adding a feature that allows better characterization of uncertainties associated with risk estimates. August 1992.
- ◆ Published tiered approach (level of modeling/monitoring increases as level of available data increases) for conducting risk assessments. February 1992.

Program Implementation & Review Section

- ◆ Developed and published the list of major and area source categories to be regulated under Section 112. This publication represented the culmination of many man-years of technical effort and negotiations. The list that was published will serve as the blueprint for the toxics program for the next 20 years. July 16, 1992.

- ◆ Worked on the development of a draft schedule for promulgation of emission standards for the source categories listed under Section 112. This schedule will establish the dates by which all of the listed categories will be regulated. Extensive technical effort on the development of a hazard-based prioritization system supported this publication. 1992.
- ◆ Worked on the development of guidance for the implementation of Section 112(l) covering State programs for hazardous air pollutants. Extensive outreach and negotiation with State and local air toxics programs has been the hallmark of this project. In addition, through the Clean Air Act advisory committee, industry and environmental groups have also been consulted on the development of this rule. 1992.

Program Integration & Health Section

- ◆ Worked very hard in 1992 to coordinate and integrate Section 112 implementation activities with State and local agencies and Regional Offices. With respect to State and local agencies, our greatest achievement was the Hazardous Air Pollutants Implementation Workshop which we developed, managed and conducted. Other achievements include monthly conference calls with the STAPPA/ALAPCO (state and local air regulators) air toxics committee and with Regional Office staff.
- ◆ Undertook extensive outreach and consensus building activities with interested parties such as the Clean Air Act Advisory Committee on the development of guidance for the implementation of Section 112(g), Modifications. Developed a draft regulation which includes a hazard ranking of the 189 chemicals. 1991 through 1992.
- ◆ Completed the development of a strategy for preparing the Report to Congress on deposition of hazardous air pollutants in the Great Lakes and other U.S. waters due in November 1993. Conflicting priorities among many diverse programs at the Federal, State and local level had to be considered and incorporated in the development of the strategy. An authors meeting will be taking place in November to write the first draft. September 1992.

Standards Development Branch

- ◆ Provided experienced regulatory and specialized engineering support to the development of technology standards for air toxics emissions from major sources such as chemical manufacturing plants, coke ovens and dry cleaners. In developing such standards, worked closely with state and local air pollution agencies, industry and environmental groups to address numerous complex technical issues and develop standards which are protective of the environment and cost effective.
- ◆ Provided experienced regulatory support to the development of key EPA policies relating to the implementation of Title III of the 1990 Amendments, Presidential Executive Orders, and key legislation that affect federal regulatory development.

These policies address legislation such as the Regulatory Flexibility Act and the Paperwork Reduction Act, as well as Executive Order 12291, which requires cost and benefit analyses to support major regulations.

- ◆ Provided experienced and specialized cost engineering and economic support to the development of air pollution emission standards for stationary sources. This effort includes the development of detailed cost and economic impact analyses for all control strategies under consideration. Also provided technical support and guidance to State and local agencies in assist them in developing and performing their own analyses of cost and economic impacts of air pollution control alternatives.

Standards Preparation Section

- ◆ Published proposed rule setting MACT and generally achievable control technology (GACT) standards for perchloroethylene emissions from drycleaning facilities. December 9, 1991.
- ◆ Developed proposed rule setting MACT standard for synthetic organic chemical manufacturing industry (the HON) for OMB review (December 24, 1991) and for proposal in the *Federal Register*. October 1992.
- ◆ Developed hazardous air pollutants emissions averaging policy for MACT standards. October 1992.

Regulations Preparation Section

- ◆ Provided regulatory support for proposed rule to control and monitor air emissions hazardous waste treatment, storage and disposal facilities under the Resource Conservation and Recovery Act. July 22, 1991.
- ◆ Developed proposed rule containing general provisions for all Federal standards regulating sources of hazardous air pollutants. January 1992.
- ◆ Developed proposed NESHAP for coke oven emissions through regulatory negotiations. Committee signing scheduled for October 28, 1992.

Regulations Development Section

- ◆ Published final rule limiting emissions of particulate matter, carbon dioxide, dioxins, sulfur dioxide, hydrogen chloride, and nitrogen oxides emissions from new and existing municipal waste combustors burning more than 250 tons/day of waste. February 11, 1991.
- ◆ Developed regulatory package which would propose revisions to the above rules based on the use of maximum achievable control technology (MACT) and to propose new rules limiting the above emissions from new and existing municipal waste combustors burning less than 250 tons/day of waste. July 1992.

- ◆ Published Notice of Additional Information soliciting public review of new information gathered since proposal concerning recently developed technology for controlling perchloroethylene emissions from dry cleaning facilities and requesting public comment on how this new information should be used in developing final rules limiting perchloroethylene emissions from dry cleaning facilities. October 1992.

Cost & Economic Impact Section

- ◆ Implemented innovative approaches for estimating economic impacts and selecting cost effective regulatory options for the Hazardous Organic NESHAP (National Emission Standard for Hazardous Air Pollutants). January 1991.
- ◆ Completed a draft report to Congress on alternative economic incentive regulatory strategies for consumer and commercial products. This report may form the basis for consumer and commercial product regulations under Section 183(e). September 1992.
- ◆ Completed an innovative study involving an integrated market and financial analysis to address the difficult question of the impact of the Dry Cleaning MACT standard on the many small dry cleaning businesses. May 1991.

Industrial Studies Branch

- ◆ Provided experienced and specialized engineering support to several major programs for reducing particulate matter (PM), sulfur dioxide, and oxides of nitrogen. These programs include the development of the Clean Air Act rules, the preparation of alternative control technology documents for states to use in developing their rules, and case-by-case technical assistance to State and local agencies for reducing particulate emissions.
- ◆ Provided experienced and specialized engineering support in evaluating and identifying control technology options for the development of national air toxics standards for combustion units, smelting operations, and other industrial processes. The branch has developed technical information that it has shared with other government agencies and countries to assist them in understanding and developing control strategies for these air toxics sources.
- ◆ Provided experienced and specialized engineering support in evaluating and identifying control technology options for the development of Federal standards for air pollution emissions from solid waste combustion. This work has included complex analyses of alternative control strategies and their impact on emissions. The branch has shared this work with State and local agencies and environmental protection agencies in other countries to assist them in addressing this growing industry.

Standards Documentation Section

- ◆ Published proposed and final rule establishing standards of performance for small industrial-commercial-institutional steam generating units. June 9, 1989, and September 12, 1990.
- ◆ Published and made available for public use a medical waste incinerator (MWI) operator training course in March 1989; initiated and participated with the ASME in developing an MWI operator certification program which was completed in September 1992.
- ◆ Published and made available for public use the following technical reports and/or documents relating to medical waste incinerators:
 - *Operation and Maintenance of Hospital Waste Incinerators* (March 1989)
 - *Medical Waste Incinerators: Background Information for Proposed Standards and Guidelines* (September 30, 1991)
 - *Industry Profile Report For New and Existing Facilities*
 - *Process Description Report for New and Existing Facilities*
 - *Model Plant Description and Cost Report for New and Existing Facilities*
 - *Control Technology Performance Report for New and Existing Facilities*
 - *Environmental Impacts Report for New and Existing Facilities*

Standards Support Section

- ◆ Provided technical and engineering support for final rule limiting emissions of particulate matter, carbon dioxide, dioxins, sulfur dioxide, hydrogen chloride, and nitrogen oxides emissions from new and existing municipal waste combustors burning more than 250 tons/day of waste. February 11, 1991.
- ◆ Completed major portions of the Report to Congress on "Volatile Organic Compound Emissions from Consumer and Commercial Products" required under ozone nonattainment provisions of the Clean Air Act Amendments of 1990. Statutory deadline is November 15, 1993. August 1992.
- ◆ Completed an engineering evaluation of the Jewell design Thompson non-recovery coke oven technology as required under Section 112(d). October 1992.

Stationary Source Compliance Division

- ◆ Developed and coordinated all Clean Air Act Title VII rulemakings including: the monetary award program; citizen suits; field citation; administrative penalty; contractor listing; and enhanced monitoring rules.
- ◆ Coordinated several national enforcement initiatives including: a compliance investigation of the wood panel industry which resulted in enforcement action against the Louisiana Pacific Company for numerous PSD and SIP violations; a

lead enforcement initiative which targeted the major lead sources; and the 1992 administrative penalty order case initiative which implemented the new administrative penalty authority by filing 52 cases and a total of 100 by the end of the fiscal year.

- ◆ Developed outreach, training, guidance and policy documents to enhance compliance with the Act which included: establishment of a training center at Rutgers University Demonstration Center and a program using the California Air Resources Board for state training; development of a hazardous waste incineration training course using video conferencing; development of 23 plant specific inspection manuals for CFC sources; and implemented new significant violator/timely and appropriate enforcement guidance.

Technical Support Branch

- ◆ Developed training manuals and courses for: 23 plant specific CFC sources; hazardous waste incineration procedures; and draft training course documents for radionuclide NESHAPs requirements.
- ◆ Initiated the application of the revised SV/T&A guidance; reviewed and reduced the reporting requirements for Regional input; and evaluated the MOARS reports for national program status.
- ◆ Developed and maintained integration of the asbestos NESHAP program with the OPPT AHERA program.

Inorganic Chemicals Section

- ◆ Developed and maintained integration of the asbestos NESHAP program with the OPPT AHERA program.
- ◆ Provided the compliance coordination in development and maintenance of the Lead Strategy as part of the Agency's Lead Cluster Initiative.
- ◆ Coordinated the Compliance Rule Effectiveness program successfully completing 14 Rule Effectiveness studies with an additional 13 in process.

Organic Chemicals Section

- ◆ Set up and maintained technical coordinator workgroups with the Regional Offices for VOC (volatile organic compounds), Air Toxics and Radionuclides Compliance to enhance communications and to identify and resolve implementation issues related to the Clean Air Act and the Clean Air Act Amendments of 1990.
- ◆ Identified, conducted and completed 27 "Technical Agenda" projects, which provided technical support, policy guidance and training in inspection techniques to Regional, State and local compliance agencies in the areas of VOCs, air toxics and radionuclides.

- ◆ Developed 23 CFC plant-specific inspection manuals and an inspector training course to assist in the implementation of the Montreal Protocol on depletion of the ozone layer.

Regional Programs Section

- ◆ Issued guidance on the "Timely and Appropriate Enforcement Response to Significant Air Pollution Violators" which established a new standard for federal overfilling, revised the definition of SV, and lengthened the timeline for addressing SVs.
- ◆ Conducted reviews of Regional Office air compliance and enforcement programs which established baseline for evaluating progress and program effectiveness in the future.
- ◆ Initiated pilot program for Air Compliance Planning and Oversight Guidance to give each state more freedom to establish program goals and commitments suitable to the unique circumstances of a state.

Compliance Monitoring Branch

- ◆ Developed and coordinated all Clean Air Act Title VII rulemakings including: the monetary awards program; citizen suit; field citation; administrative penalty; contractor listing; and enhanced monitoring rules.
- ◆ Assisted in the development of the Title VI Stratospheric Ozone Protection Program rules.
- ◆ Created and enhanced two air compliance databases for tracking enforcement and inspection activities, the AIRS Facility Subsystem for stationary sources and ACTS for asbestos demolition and renovation projects.

Policy & Guidance Section

- ◆ Published final rule providing Clean Air Act Administrative Hearing Regulations, February 4, 1992.
- ◆ Coordinated the Clean Air Act Administrative Penalty Program which resulted in the filing of 100 administrative complaints for fiscal year 1992. Also coordinated the 1992 Clean Air Act Administrative Case Initiative resulting in the filing of 52 cases on May 20, 1992, with a total of over \$4 million in pled penalties.
- ◆ Submitted to OMB in February, 1992 the draft proposal package for the monetary awards program and in April, 1992 the draft proposal package for the citizen suit regulations.

Compliance Analysis Section

- ◆ Created a new, all encompassing air database, the AIRS Facility Subsystem, by merging existing compliance and emission databases. April 1990.
- ◆ Developed the Compliance Monitoring Strategy and the Inspection Target Model in order for States to maximize their enforcement resources by targeting the most environmentally significant sources for inspections. March 1991.
- ◆ Developed a draft Enhanced Monitoring and Compliance Certification Rule as required by the Clean Air Act Amendments of 1990 to gain a better assessment of compliance over time by sources. January 1992.

Federal Program Section

- ◆ Developed compliance monitoring strategies for regulations which require recycling of stratospheric ozone depleting chemicals. 1992.
- ◆ Fully implemented the wood stove emission certification program. July, 1992.
- ◆ Brought the first enforcement actions for violations of the Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer. 1990.

Air Quality Management Division

- ◆ Developed and issued rules required by the Clean Air Act and the 1990 Act Amendments, including rules to protect visibility in the Grand Canyon, requirements for State operating permit programs, designations and classifications of nonattainment areas for all pollutants and areas of the country, and rules for economic incentive programs.
- ◆ Provided guidance and assistance to ensure effective implementation of the 1990 Amendments, including the General Preamble and NO_x addendum to guide States in developing SIP's; holding a number of workshops on the final operating permit rules and on the new source review program; development of model operating permits, VOC rules, and SIP control strategies; issuing best available control measures (BACM) technical guidance documents; implementing a targeted program for reducing lead concentrations around major point sources; and issuing the small business assistance program guidance.
- ◆ Provided management, oversight, and training to Regions and States through the Regional Memorandum of Agreements, the Regional air pollution training conference in Greensboro, North Carolina, expansion of the network of air pollution technical training centers, and installation of training satellite downlinks in 60 State and local agencies.

Ambient Standards Branch

- ◆ Conducted cost, economic, and benefits analyses to support the development of the 1990 Amendments and major regulatory actions (e.g., operating permits, NESHAPS, and outer continental shelf rules).
- ◆ Developed and supported economic incentive and other innovative strategies by conducting a national workshop on innovative regulatory strategies, developing EPA's economic incentive rules and support of the RECLAIM program in the South Coast Basin of California.
- ◆ Supported visibility protection efforts by assisting in the establishment of the Grand Canyon Commission and providing scientific and economic analyses for the impact assessments of the Navajo Generating Station.

Standards Development Section

- ◆ Supported visibility protection efforts by assisting in the establishment of the Grand Canyon Commission and providing technical support for the visibility impact assessment of the Navajo Generating Station. 1990-1992.
- ◆ Contributed programmatic and technical expertise to the development of the EPA's integrated lead strategy. February 1991.
- ◆ Prepared exposure assessments and information on the direct health effects of sulfur dioxide, acidic aerosols, ozone, and nitrogen dioxide for the Integrated Assessment Report of the National Acid Precipitation Assessment Program. 1989-1991.

Economic Analysis Section

- ◆ Prepared an integrated assessment of the benefits associated with the 1990 Amendments to the Clean Air Act.
- ◆ Issued key analyses in support of the final rules for Operating Permits and Air Pollution from Outer Continental Shelf Sources, including the Regulatory Impact Analysis, Regulatory Flexibility Screening, and Information Collection Request Analysis. June, August 1992.
- ◆ Issued Regulatory Impact Analyses in support of the inclusion of SO₂ controls in the Federal Implementation Plan for the Navajo Generating Station. February 1990, January 1991.

Regulatory Strategies Section

- ◆ Conducted national workshop on innovative regulatory strategies for air pollution control, focusing on economic incentives. January 15-17, 1992.

- ◆ Developed framework for approvable economic incentive programs and drafted rules and guidance package targeted for proposal by year-end. September 1992.
- ◆ Provided policy and technical input to the South Coast Air Quality Management District's effort to develop a Regional Clean Air Incentives Market (RECLAIM) in California and to other States developing market-based programs for air pollution control, through EPA grants. Ongoing.

Permits Programs Branch

Operating Permits Policy Section

- ◆ Published final rule setting minimum requirements for State air pollution operating permit programs. July 21, 1992.
- ◆ Completed three national workshops, co-sponsored with the State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officials on the requirements for approvable operating permits programs. August-October, 1992.
- ◆ Initiated model permits program designed to provide example permits for State and local agency use for over 60 source categories. January 1992 (continuing project).

New Source Review Section

- ◆ Published final Wisconsin Electric Power Company (WEPCO) rules for new source review applicability for utilities undertaking environmentally-beneficial pollution control projects. July 21, 1992.
- ◆ Completed five national workshops, co-sponsored with the Air and Waste Management Association, on the new source review permitting process. April 1992.
- ◆ As part of the United States/Canadian air quality agreement, conducted two workshops with Canadians to explain the U.S. prevention of significant deterioration program. May-September 1992.

Air Pollution Training Branch

- ◆ Developed and implemented training curricula and training centers for major CAA activities involving operating permits and inspector training.
- ◆ Continued delivery of technical training to over 6000 students and improved delivery capability by setting up a satellite network with 40 presentations scheduled in FY 93.

- ◆ Developed new training evaluation procedures and a study to evaluate computer technologies to improve source inspection and permitting activities.

Training Development Section

- ◆ Developed and implemented permit training curriculum for employees of State and local agencies.
- ◆ Developed evaluation procedures for distance learning and improved evaluation procedures for self-study and short course presentations.
- ◆ Initiated pilot study to evaluate the capabilities of computer technologies to improve source inspection and permitting activities.

Training Delivery Section

- ◆ Set up national system for delivery of training via satellite and scheduled 40 presentations for delivery in the coming year.
- ◆ Provided technical training through classroom presentations, self-study programs, and satellite delivery to more than 6,000 students.
- ◆ Implemented a comprehensive inspector training program which provides intensive training through three levels, i.e., basic, intermediate, and advanced and established two similar centers for permit training.

Sulfur Dioxide/Particulate Matter Programs Branch

- ◆ Directed activities to meet CAA deadlines, including nonattainment designations, submission of PM-10 SIP's, issuance of letters starting the time-clock for sanctions, reclassification of areas to "serious," and BACM technical guidance.
- ◆ Provided implementation guidance and assistance including input to the General Preamble, model permits, example control strategies, and guidance for serious PM-10 areas.
- ◆ Directed implementation of targeted lead strategy focusing on identifying and correcting air quality problems around major point sources.

Program Development Section

- ◆ Innovated monitoring techniques for PM-10 and lead to produce more timely and efficient air quality assessments (similar development underway for SO₂).
- ◆ Conceived the basis for strategic targeting of lead, PM-10 and SO₂ air quality problems based on their probable exposure risks to the population.

- ◆ Improved understanding of nontraditional sources of PM-10 and their potential controls, coordinated with Departments of Transportation and Agriculture. [Best Available Control Measures and Fugitive Dust control guidance documents]

Policy and Guidance Section

- ◆ Produced major portions of 1990 CAAA for Titles I (related to PM-10, SO₂ and lead) and IV (acid rain), and provided critical support to related legislative activities.
- ◆ Established the most comprehensive program guidance in over a decade to meet the new requirements of Title I for SO₂, PM-10 and Lead. [General Preamble for Title I]
- ◆ Assisted Regional Offices, States, and affected industries with national models for key program elements (permits, regulatory packages for SIP's, example control strategies, control techniques for stationary and area sources).

Implementation and Regulatory Section

- ◆ Directed an unprecedented effort across several OAR and Regional Office units to resolve lead air quality problems in a targeted fashion; approach has been cited as a model for other programs to emulate. [OAR component of EPA Lead Strategy]
- ◆ Timely promulgation of nonattainment designations; coordinated a national effort for timely submission of PM-10 SIP's, and secured nationally consistent actions where SIP's were not completed within CAA deadlines.
- ◆ Developed a cooperative process with States to resolve regulatory SO₂ issues threatening the success of key programs.

Ozone/Carbon Monoxide Programs Branch

- ◆ Published final General Preamble on preparation of ozone and carbon monoxide State implementation plans (April 16, 1992); prepared draft supplement to the General Preamble relating to oxides of nitrogen (November 1992).
- ◆ Issued national designations and classifications of all nonattainment areas for ozone and carbon monoxide in response to the Clean Air Act Amendments of 1990. (11/6/91)
- ◆ Provided implementation guidance and assistance including model permits and RACT rules, RECLAIM support, and assistance in developing FIPs in California.

Strategies and Policy Section

- ◆ Published final General Preamble on preparation of ozone and carbon monoxide State implementation plans (April 16, 1992); prepared draft supplement to the General Preamble relating to oxides of nitrogen. (November 1992).
- ◆ Prepared draft and final technical guidance on preparation of ozone and carbon monoxide State implementation plans. (July-November 1992).
- ◆ Initiated the OAQPS Environmental Education Program. (October 1992).

Engineering and Rule Development Section

- ◆ Coordinated OAQPS involvement in proposing and promulgating rules controlling emissions from outer continental shelf sources. September 4, 1992.
- ◆ Issued a set of model rules and permits for States to use in developing and revising rules for volatile organic emissions.
- ◆ Developed a computerized system of all guidance for States and industries to use in controlling volatile organic emissions from stationary sources.

Program Oversight and Implementation Section

- ◆ Issued national designations and classifications of all nonattainment areas for ozone and carbon monoxide in response to the Clean Air Act Amendments of 1990. November 6, 1991.
- ◆ Promoted and provided extensive support for innovative control strategies and market based economic incentives programs such as the South Coast regional clean air market.
- ◆ Redesignated Kansas City, Kansas and Kansas City, Missouri from nonattainment to attainment of the ozone national ambient air quality standard; and redesignated Atlanta, Georgia and Providence, Rhode Island from nonattainment to attainment of the carbon monoxide national ambient air quality standard. June-September 1992.

Regional Operations Branch

- ◆ Provided guidance and oversight of Regional activities through implementation of the Memorandum of Agreement process, preparation of the air portion of the Agency's Program Specific Guidance, and management of the level of effort contracts for the Regions.
- ◆ Issued in January 1992 the section 507 Small Business Assistance Program (SBAP) guidelines and accompanying documents: the SBAP SIP Approval Checklist (May 1992), Guidelines for Regional Office Implementation of the Federal Compliance

Assistance Program (October 1992), Guidelines for Contractor Execution of the Small Business Assistance Program (October 1992), and A Guide for Small Businesses (September 1992).

- ◆ Held the annual Regional Office/OAQPS Air Program Training Workshop in Charlotte, NC (July 13-17, 1992), bringing together Regional and Headquarters staffs to present and have interchange on developing and recently issued air program regulations and policy. Almost 400 people attended.

Regional Management Section

- ◆ Developed and implemented the Memorandum of Agreement process between OAR and Regional Offices to provide management focus on the implementation of the Clean Air Act.
- ◆ Prepared Program Specific Guidance for use by the Regions and State and local agencies to assist in implementation of the Clean Air Act Amendments of 1990 requirements. (Issued June 19, 1992)
- ◆ Prepared a computerized work assignment managers' (WAM) training manual that is accessible through the Air Quality Management Division's computer bulletin board system. This manual allows individuals to learn more about the requirements of contracts management and processing work assignments. System also contains a "news flash" section that allows us to keep the Regions informed as to the latest information regarding contracts, new requirements, availability of contractors, etc.

Regional Activities Section

- ◆ Issued in January 1992 the section 507 Small Business Assistance Program (SBAP) guidelines and accompanying documents: the SBAP SIP Approval Checklist (May 1992), Guidelines for Regional Office Implementation of the Federal Compliance Assistance Program (October 1992), Guidelines for Contractor Execution of the Small Business Assistance Program (October 1992), and A Guide for Small Businesses (September 1992).
- ◆ Completed initial round of SIP Processing Program Reviews in the ten Regional Offices. Goal was to ensure that Regions are properly implementing their new SIP processing authority granted under SIP Reform. Results showed excellent application of Headquarters guidance on processing SIP's.
- ◆ Held the annual Regional Office/OAQPS Air Program Training Workshop in Charlotte, NC (July 13-17, 1992). The purpose is to bring together Regional and Headquarters staffs to present and have interchange on developing and recently issued air program regulations and policy. Almost 400 people attend.

Technical Support Division

- ◆ Enhanced outreach effort concerning the availability of air quality, emissions, and other air pollution related information to the public through the Air Quality Atlas, the Airs Graphics system, early release of the 1991 Trends Report and maintenance/expansion of the OAQPS Technology Transfer Network (an electronic bulletin board system). September 1992.
- ◆ Established the Emission Inventory Branch and focussed its attention on successful implementation of O₃/CO SIP emissions inventory requirements as mandated by the Clean Air Act amendments with 1992 designated as "EPA Year of the Emissions Inventory". September 1992.
- ◆ Conducted an ongoing program of Regional model applications to assess the relative significance of VOC and NO_x control strategies for ozone concentrations in the eastern U.S. which served as the technical basis for deliberations of the Ozone Transport Commission and for formulation of Agency policy on NO_x control requirements. May 1992.

Emission Inventory Branch

- ◆ Established the OAQPS Emission Inventory Branch with its focus on the O₃/CO SIP Emission Inventory requirements as mandated by the CAAA of 1990 and designated "1992 -EPA Year of the Emission Inventory," to help achieve recognition of the new priority and importance of the emission inventory programs. September 1991.
- ◆ Established a process for submittal and quality review of Inventory Preparation Plans (IPPs) as well as draft O₃/CO SIP Emission Inventories and achieved 100% submittal of IPPs and about 70% submittal of the required emission inventories. September 1992.
- ◆ Initiated activities of OAQPS, AREAL, and AEERL to pool resources for the development and scoping of air toxic emission inventory requirements for support of Urban Area Source Program and the Great Waters Program and other air toxic programs requiring emission information. January 1991.

Emission Factor & Methodologies Section

- ◆ Published and distributed results of review/update of Compilation of Air Pollutant Emission Factors, AP-42, its supplements, and related data bases/reports as required by Section 130 of the Clean Air Act through a Compact Disc format. May 1992.
- ◆ Established an active and cooperative source testing program with industry and other EPA entities to develop data for improved emission factors. May 1991.

- ◆ Undertook and substantially completed a major effort to revise all of AP-42 in support of the ozone, PM-10, lead, toxics and global warming programs with results printed in AP-42. October 1992.

Inventory Guidance & Evaluation Section

- ◆ Issued necessary guidance for preparation of 1990 base year emission inventories needed for preparation of ozone and carbon monoxide emission inventories and for the Emission Statement Program. July 1992.
- ◆ Established guidance for EPA review and acceptance of 1990 base year emission inventories and implemented review process. January 1992.
- ◆ Issued National Emission Trends Report for periods 1940-1990 and 1990-1991. October 1992.

Emission Measurement Branch

- ◆ Developed and expanded the Emission Measurement Technical Information Center (EMTIC) to advance the nationwide use of sound air emission testing methods and procedures and to facilitate technical communications via workshops, training videos, quarterly mailouts, the monthly newsletter Stacknotes, and an electronic bulletin board system including frequent updates of the Test Methods Storage and Retrieval System (TSAR) computerized information system. October 1992.
- ◆ Developed Method 301 for the validation of air emission test data especially for circumstances when no reference method exists or when industry or air pollution control agencies have candidate alternative methods such as for utilization in the Title III Early Emission Reduction Program. October 1992.
- ◆ Developed, refined, validated, or proposed over 20 air emission test methods and conducted over 100 tests in support of emission factor and air emission regulations development for Title I, Title III, Title IV, Title V and Title VII programs. October 1992.

Chemicals & Petroleum Testing Section

- ◆ Developed, refined, validated, or proposed toxic air emission test methods and conducted highly complex tests targeted for 12 hazardous air pollutants at 8 paper and pulp mills in support of the integrated air emission and water effluent regulations. October 1992.
- ◆ Developed and refined numerous criteria pollutant air emission test methods for support of the State Implementation Plans RACT fix-ups and the new source performance standards including VOC from coatings, condensable particulate matter, capture efficiency, and most recently revised continuous opacity monitor specifications. October 1992.

- ◆ Developed air emission test Methods 25D, 304, and 305 in support of the RCRA treatment, storage, and disposal facilities regulation and the CAAA Title III Hazardous Organic NESHAP which will regulate over 120 toxic pollutants emitted from synthetic organic chemical manufacturing industry facilities. October 1992.

Compliance and Implementation Testing Section

- ◆ Developed the emission and parameter monitoring reference document for the Title VII Enhanced Monitoring and Compliance Certification regulations package which will affect all major pollutants and major sources for all of the Title I and Title III programs. September 1992.
- ◆ Developed numerous technical documents, data calculation spreadsheets, quality assurance procedures, test method cost models, site-specific test plan preparation guidelines, and test reporting format guidelines to improve the quality of emission data nationwide. September 1992.
- ◆ Developed and validated toxic emission methods for 8 toxic pollutants and developed Method 303 for the quantification and certification of coke oven leak observations in support of the regulatory negotiations for the Title III Coke Oven regulations. October 1992.

Manufacturing & Combustion Testing Section

- ◆ Developed extractive Fourier Transform Infrared Spectroscopy (FTIR) techniques for the measurement of stack emission to demonstrate that FTIR techniques are capable of quantifying numerous toxics from various source categories and will be a highly valuable additional tool for measuring the many toxics for which other means are not available or are very expensive or time-consuming. September 1992.
- ◆ Developed, refined, validated, proposed, or promulgated several emission test methods (for mercury, lead, cadmium, chlorine, bromine, dioxin,---) and conducted several tests in support of the Municipal Waste Combustor regulations I and II/III. October 1992.
- ◆ Developed preliminary criteria for air emission sampling accreditation and actively participated in and promoted the activities of the Environmental Monitoring Management Council in Agency-wide efforts of analytical laboratory accreditation and methods integration. October 1992.

Monitoring and Reports Branch

- ◆ Served as Deputy Team Leader of the Persian Gulf Risk Evaluation Team. April 1991.
- ◆ Directed the development of the Persian Gulf Regional Air Monitoring Plan which was endorsed by 22 nations. April 1991.

- ◆ Accompanied the Administrator on a Presidential Fact Finding Mission on the environmental impact of the Kuwaiti oil fires. May 1991.

Data Analysis Section

- ◆ Annually published the National Air Quality and Emission Trends Reports. October 1992.
- ◆ Published the ozone design values which are the basis for the serious, severe and extreme nonattainment areas for ozone and the design values for CO and PM-10. October 1992.
- ◆ Initiated the Clean Air Indicators Project to track environmental indicators associated with the implementation of the 1990 Clean Air Act. April 1991.

Monitoring Section

- ◆ Proposed the enhanced ozone monitoring regulations requiring the monitoring of volatile organic compounds, carbonyls, ozone, nitrogen oxides and meteorological variables. March 1992.
- ◆ Rebuilt the monitoring equipment infrastructure by obtaining 5 million dollars to replace aging equipment. October 1991.
- ◆ Developed the Ambient Monitoring Technology Information Center (AMTIC) to facilitate the exchange of ambient monitoring technology, guidance and regulatory information among State, local and foreign governments. September 1991.

National Air Data Branch

- ◆ Greatly expanded the functional capabilities of the Aerometric Information Retrieval System (AIRS) while successfully maintaining the software for continuous data entry and retrievals of all air quality, emissions, and compliance data submitted to EPA by the States. August 1992.
- ◆ Significantly increased the number of people and organizations using AIRS for both data entry, retrievals, and analysis, including a number of international programs (e.g., U.S.-Canada, U.S.-Mexico, World Health Organization) who are, or soon will be using the AIRS software in their respective *air management programs*. September 1992.
- ◆ Completed major AIRS user-friendliness projects including PC/mainframe interfaces, help screens, software, troubleshooting service, and new analytical capabilities such as graphics. September 1992.

AIRS Section

- ◆ Developed a new subsystem in AIRS (the Area and Mobile Source Subsystem) that stores and retrieves State implementation plan (SIP) emission inventory data for area and mobile sources required to be reported under Title I of the Clean Air Act Amendments. July 1992.
- ◆ Enhanced and expanded the AIRS Facility Subsystem to (1) store and retrieve the SIP point source emission inventory data required to be reported under Title I of the Clean Air Act Amendments, and (2) allow the updating of multiple years of emission inventory data. August 1992.
- ◆ Maintained production version AIRS software for continuous updating of air quality, emissions, and compliance data into the national data base. August 1992.

Operations & Maintenance Section

- ◆ Completed two new user-friendly software products: the AIRS Graphics on the IBM mainframe and AIRS Executive on the PC that provide all AIRS users with excellent graphics capabilities and management summary information from the data stored in AIRS. September 1992.
- ◆ Compiled detailed and comprehensive user requirements for the Title V Operating Permits program that addressed tracking of permit, notification of affected State agencies, and tracking of permit fees through interviewing and conducting workshops with attendees from EPA, State, and local agencies. July 1992.
- ◆ Initiated extensive AIRS user-friendliness projects (i.e., help screens, and interactive access to codes) to simplify State data-entry capabilities. January 1992.

Source Receptor Analysis Branch

- ◆ Applied a comprehensive Regional-scale ozone model to determine the relative effectiveness of VOC and NOX control strategies across the eastern U.S. which served as a substantial technical basis for deliberations of the Ozone Transport Commission. May 1992.
- ◆ Developed a sound statistical system for removing meteorological influences from ozone trends and identifying adjusted design values as a measure of the true effectiveness of control measures for ozone precursor pollutants. November 1991.
- ◆ Established a written basis for considering the uncertainty of mathematical model estimates in air pollution control programs under a joint review by managers/modelers representing both EPA and State agencies. April 1992.

Model Application Section

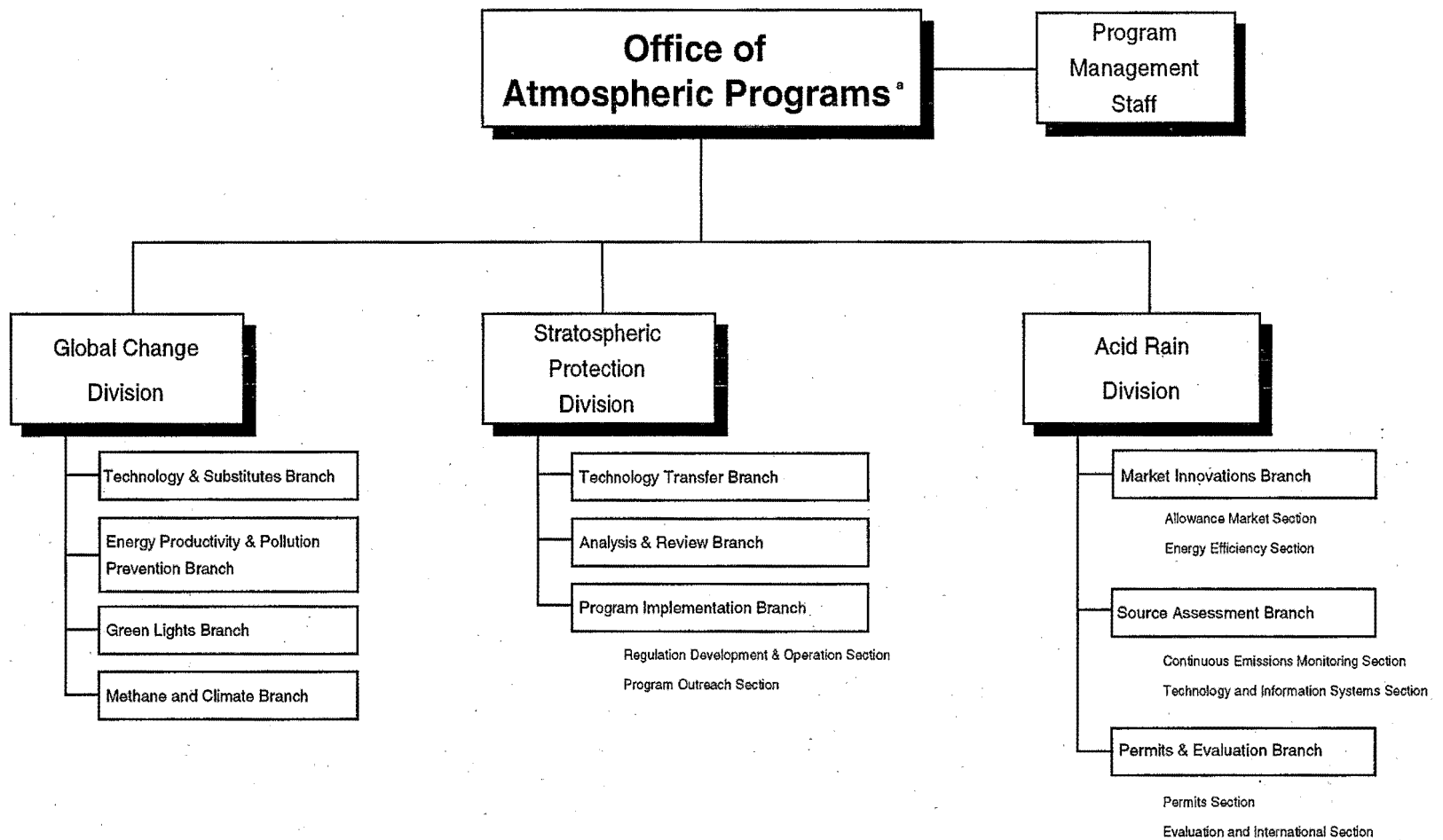
- ◆ Published comprehensive documentation and guidance on use of complex photochemical grid models in ozone attainment demonstrations as required by the Clean Air Act. July 1991.
- ◆ Developed a highly sophisticated mathematical modeling approach to simulate the effectiveness of control strategies for ozone over multistate areas and published results of the ROMNET study for the northeastern U.S. June 1991.
- ◆ Published innovative modeling procedures for assessing risks due to stationary sources of hazardous air pollutants in "A Tiered Modeling Approach to Assessing the Risks Due to Sources of Hazardous Air Pollutants." March 1992.

Modeling Support Section

- ◆ Implemented a comprehensive 64 line electronic bulletin board system to support technology transfer to State and local air pollution control agencies as well as environmentalists throughout the world. October 1991.
- ◆ Implemented on the Office of Air Quality Planning and Standards Technology Transfer Network the BACT/RACT/LAER Information System containing air permits from local, State and Regional air pollution control agencies. September 1992.
- ◆ Implemented the Clean Air Act Bulletin Board providing fast and efficient electronic access to information on regulatory requirements, rules, policy/guidance documents, related to the Clean Air Act Amendments. May 1991.

Techniques Evaluation Section

- ◆ Finalized revisions to Guideline on Air Quality Models and sent to the Office of Management and Budget, for review prior to final promulgation. August 1992.
- ◆ Completed and provided the public with a revised computer code for the widely used Industrial Source Complex Model. March 1992.
- ◆ Established a Memorandum of Understanding between EPA, the Forest Service, the Fish and Wildlife Service, and the National Park Service to identify air quality modeling techniques for assessing long-range transport impacts of new sources on Class I areas. November 1991.



^a Organization structure presented reflects a proposed office reorganization currently in Green Border Review.

OFFICE OF ATMOSPHERIC PROGRAMS

Global Change Division

Methane and Climate Branch

- ◆ Started projects in former Soviet states to quantify opportunities for controlling natural gas emissions despite political uncertainty and unrest. Engaged private sector support for the effort.
- ◆ Developed projects in China, Poland, Ukraine, Russia, and Czechoslovakia that secured over \$13 million of World Bank and other aid funds for developing countries (including initiating key demonstrations) to control methane emissions from coal mining. Completed agreement with China to consider methane in coal quotas. July 1992.
- ◆ Continued progress on four reports to Congress on (1) Anthropogenic Methane Emissions in the United States, (2) Options for Reducing Methane Emissions from Anthropogenic Sources in the United States, (3) Options for Reducing Methane Emissions Internationally, and (4) Current and Future Methane Emissions from Natural Sources. Ongoing 1992.

Green Lights Branch

- ◆ Initiated Green Lights Program to encourage companies to install energy efficient lighting. Successfully recruited over 600 members, or almost 3% of all commercial and industrial space.
- ◆ Developed a Green Lights implementation assistance program that has produced software and surveying tools for lighting upgrades, and have trained over 830 people to use the system. Developed a hotline and marketing and implementation staff that delivers over 16,000 pieces of information per month, utilizing sophisticated tele-marketing systems to track all prospective partners.
- ◆ Collaborated with NBC and our Green Lights allies and partners to produce and broadcast a television show supporting Green Lights. Secured well over \$2.3 million worth of PSA advertising and ally advertising for the Green Lights program.

Energy Productivity & Pollution Prevention Branch

- ◆ Launched the Energy Star program for computers, with 35% of the industry joining on first day. June 1992.
- ◆ Announced the Golden Carrot Super Efficient Refrigerator Program. Program will give rise to an efficient CFC free refrigerator that is 30-50% more energy

efficient than the 1993 DOE standard. The mechanism to get this refrigerator to market is a utility sponsored contest in which \$30 million is awarded to the manufacturer that can produce the most cost effective units at the earliest time. July 1992.

- ◆ Developed and supported plan to reduce greenhouse gas emissions through profitable voluntary programs. Provided analysis forming the basis for the State Department document entitled *U.S. Views on Global Climate Change*. April 1992.

Technology & Substitutes Branch

- ◆ Demonstrated new CFC-free technology for residential refrigerators that has the potential for energy savings of 8-16 percent over current refrigerator models. When in full use this technology could save Americans between \$1 billion and \$2 billion per year on their electricity bills. February 1992.
- ◆ Designed and funded development of a compressor based on a linear motor that is 20 percent more energy efficient than the most efficient compressor in the world. Savings could exceed \$14 billion if the technology is successfully commercialized.
- ◆ Published report entitled *Experimental Testing of R-22 Replacement Refrigerants in a Split System Residential Air Conditioner*. Report demonstrated that R-32 mixtures can replace R-22 in heat pumps and air conditioners without energy efficiency penalty and with probable efficiency gain. September 1992.

Stratospheric Protection Division

- ◆ Published final rule to phase out the production of Class I substances by the year 2000, establishing an allowance program to allocate production (also drafted proposal to accelerate Class I phaseout by 1995). July 1992.
- ◆ Published final rule to require recycling of refrigerants from motor vehicles, and to require that recovery technicians and recovery equipment be certified. July 1992.
- ◆ Made significant progress in negotiations with Montreal Protocol Parties to phase out Class I substances, to examine accelerated phase outs of both Class I and II substances, and to explore viable destruction technologies for these substances. Ongoing.

Acid Rain Division

- ◆ Developed the Acid Rain Core Rules through a collaborative process facilitated by the Acid Rain Advisory Committee, which consisted of representatives from the regulated community, environmental groups, and academia. Ongoing, 1991-1992.

- ◆ Promulgated the Acid Rain Core Rules: Allowance System, General Provisions and Permits, Continuous Emission Monitoring, Excess Emissions, and Administrative Appeals. October, 1992.
- ◆ Developed major implementation and outreach program involving Regions, States, and the regulated community.

Permits & Evaluation Branch

Permits Section

- ◆ Published final rule establishing requirements utilities must meet in order to obtain a permit in the Acid Rain Program. October, 1992.
- ◆ Produced simple and clear permit application forms for utilities to use in applying for a permit under the Acid Rain Program. October 1992.
- ◆ Co-developed, with Regional offices, a streamlined approach for issuing permits to utilities participating in the Acid Rain Program. November 1992.

Evaluation and International Section

- ◆ Played key role in successful negotiation of US-Canada Air Quality Agreement, signed by President Bush and Prime Minister Mulroney. March 1991.
- ◆ Developed TRAC Database which contains compliance information for over 250 Phase I units under Acid Rain Control Program. Ongoing 1992.
- ◆ Published first progress report under the US-Canada Air Quality Agreement. June 1992.

Source Assessment Branch

Technology and Information Systems Section & Continuous Emissions Monitoring Section

- ◆ Published final core Acid Rain Rule, establishing a precedent-setting market-based regulatory approach and setting new standards for the continuous monitoring of the pollutants which are major contributors to acid rain.
- ◆ Completed a major eleven-week field study that will serve as a benchmark for insuring accurate monitoring of SO₂ and NO_x emissions from coal-fired utilities over the next decade. October 1992.

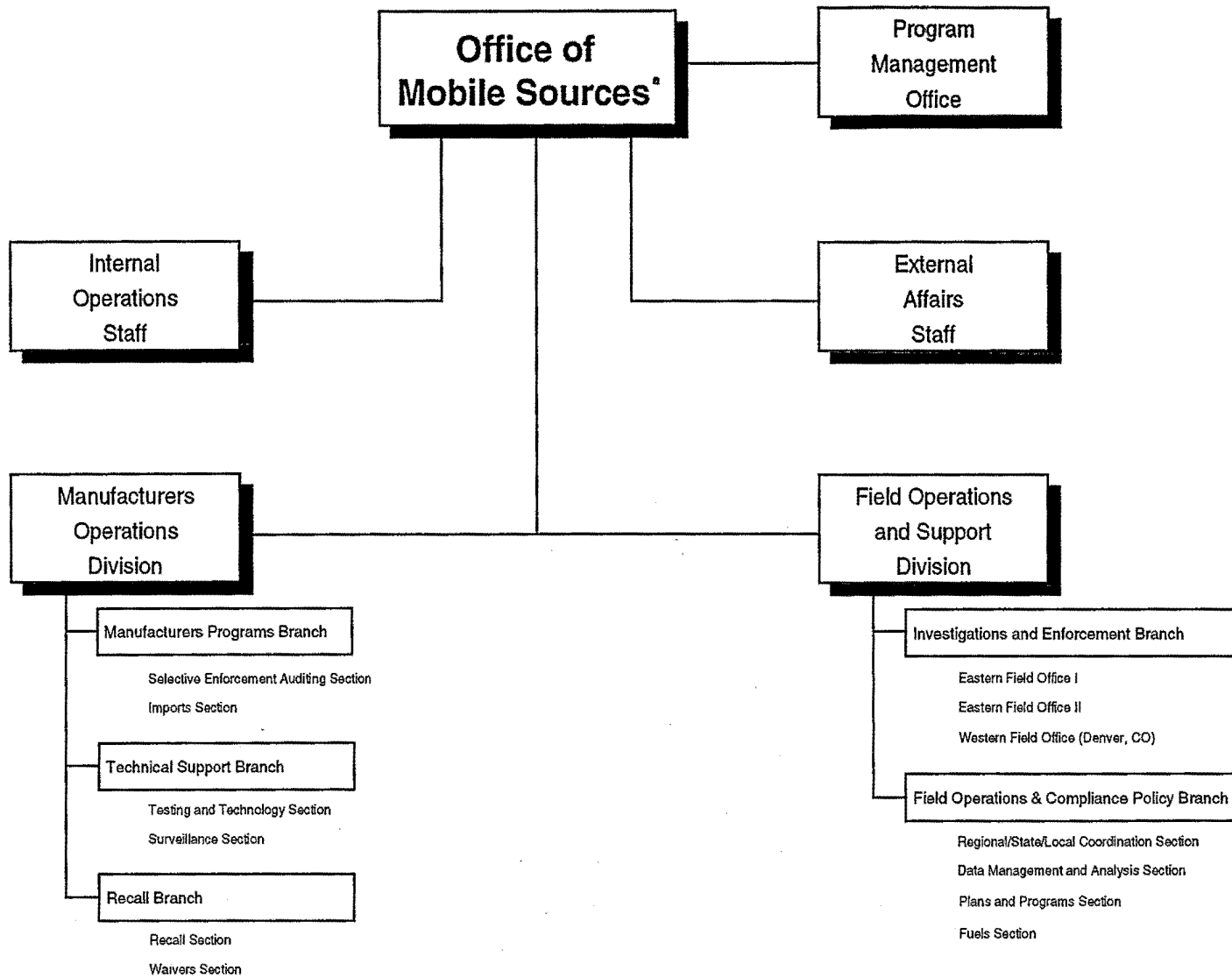
Market Innovations Branch

Allowance Market Section

- ◆ Published proposed rule setting the requirements for the tracking and transfer of sulfur dioxide emissions allowances under the Acid Rain Program. December 3, 1991.
- ◆ Published a proposed rule for allocating Phase I and II sulfur dioxide emission allowances to electric utility units affected under the Acid Rain Program. July 7, 1992.
- ◆ Published final rule and delegated, to the Chicago Board of Trade, the administrative functions for the auction and direct sale of sulfur dioxide emissions allowances under the Acid Rain Program. December 17, 1992; September 25, 1992.

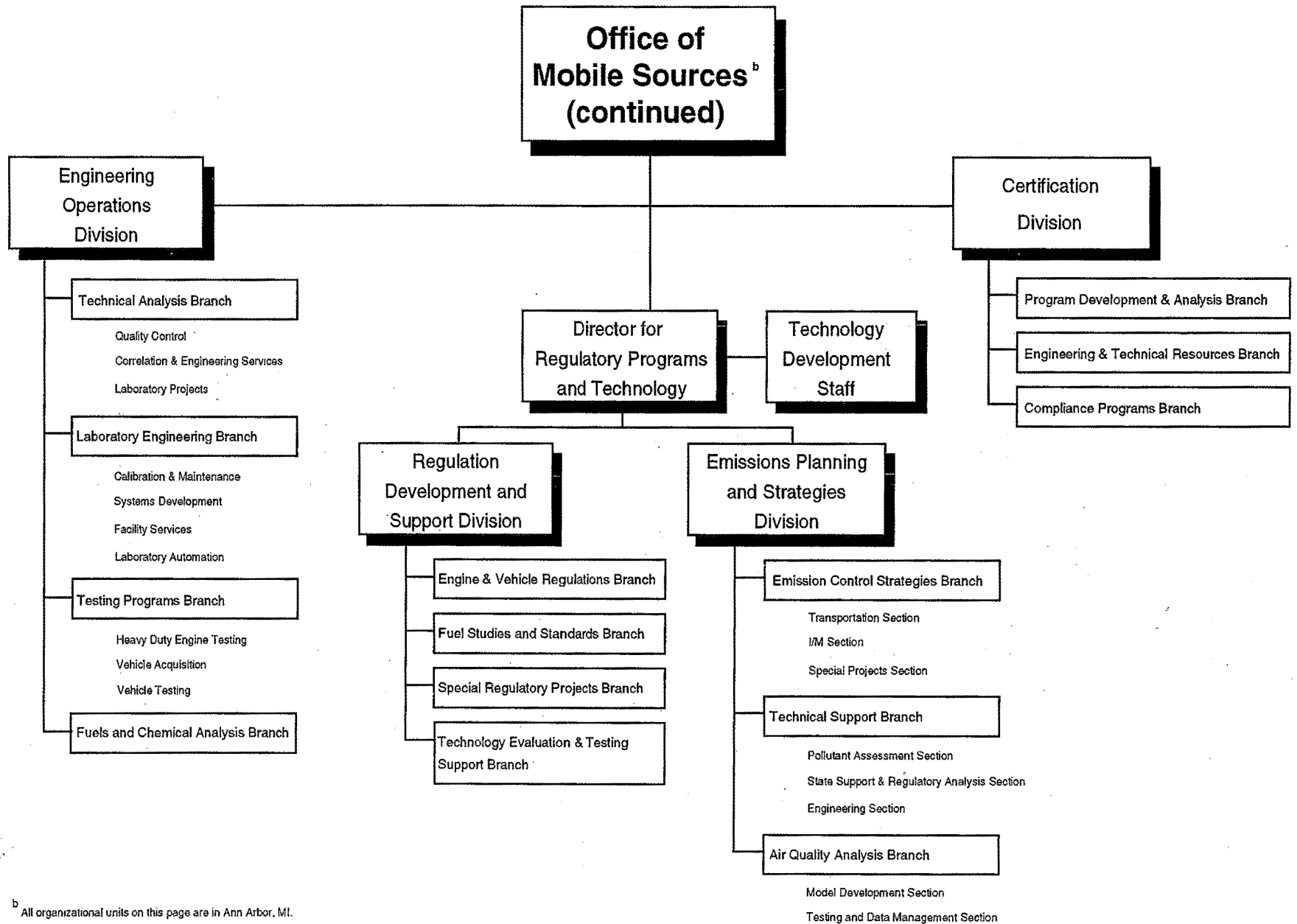
Energy Efficiency Section

- ◆ Published proposed rule establishing the Conservation and Renewable Energy Reserve allowance incentive program.
- ◆ Developed the Conservation Verification Protocols to assist utilities and public utility commissions on regulatory policies for acid rain compliance and allowance trading.
- ◆ Provided technical assistance to public utility commissions on regulatory policies for acid rain compliance and allowance trading.



^a Unless otherwise indicated, all organizational units on this page are located in Washington, DC.

National Vehicle and Fuel Emissions Laboratory



^b All organizational units on this page are in Ann Arbor, MI.

OFFICE OF MOBILE SOURCES

Manufacturers Operations Division

- ◆ Formulated and coordinated the enforcement policies included in the various Mobile Source rulemakings associated with the Clean Air Act Amendments of 1990.
- ◆ Completed third year of innovative voluntary market-based, averaging, banking and trading emission credit program for heavy-duty motor vehicle engine manufacturers.
- ◆ Established programs to measure and enforce in-use motor vehicle emission compliance at high altitude and emission compliance of heavy-duty engines.

Recall Branch

- ◆ Obtained recall of over two million vehicles in FY 92 to correct high emissions.
- ◆ Developed proposed regulatory language required by section 209(e) of the amended Clean Air Act (authorization of California non-road standards).
- ◆ Developed EPA'S response to California's request for a waiver of federal preemption pertaining to the California Low Emission Vehicle Program.

Recall Section

- ◆ Tested 42 engine families in FY 92 to determine compliance of in-use vehicles with emission standards.
- ◆ Completed first phase of study of heavy duty engine rebuilding practices as required by amended Clean Air Act.
- ◆ Completed EPA'S first heavy-duty engine recall test program.

Waivers Section

- ◆ Implemented Agency's order of recall of noncomplying 1988 model year Isuzu vehicles.
- ◆ Coordinated development of enforcement strategies included in the various Mobile Source rulemakings required by amended Clean Air Act.
- ◆ Completed EPA'S waivers of federal preemption pertaining to California's proposed Motor Vehicle Warranty Program, 1993 Vehicle Emission Standards, and Gray Market Vehicle Program.

Technical Support Branch

- ◆ Trained the division in principles of Total Quality Management (TQM) and assisted Branches in initiating pilot projects which apply the tools of TQM to improve operational efficiency.
- ◆ Implemented a Heavy-Duty Engine Recall Program which involved letting an engine procurement contract and working with the Engineering Operations Division to institute thorough equipment checks and set rigorous procedures in place to ensure the defensibility of emission results.
- ◆ Completed more Recall investigations than at any other time in the past ten years by improving efficiency within the section and using SEE personnel.

Testing and Technology Section

- ◆ Developed High Altitude In-Use Vehicle Testing Program jointly with the State of Colorado to ascertain compliance of motor vehicles at high altitudes.
- ◆ Developed advanced testing capabilities for the Motor Vehicle Recall Program which enhances the ability to determine reasons for vehicle failures.
- ◆ Implemented a Heavy-Duty Engine Recall Program which involved letting an engine procurement contract and working with the Engineering Operations Division to institute thorough equipment checks and set rigorous procedures in place to ensure the defensibility of emission results.

Surveillance Section

- ◆ Developed capabilities to monitor Heavy-Duty Engine selection and testing for both the Recall and Selective Enforcement Auditing programs.
- ◆ Expanded use of computers and electronic communication resulting in better tracking of vehicles in the program and improved data transmissions with the contractor and other sections within the division.
- ◆ Completed more Recall investigations than at any other time in the past ten years by improving efficiency within the section and using SEE personnel.

Manufacturers Programs Branch

- ◆ Settled the first civil penalty case for violations of the new Federal regulations governing imported nonconforming motor vehicles under the Clean Air Act against William D. Rogers d/b/a/ Village Imports. A consent decree was entered in Federal district court on September 15, 1992.

- ◆ Settled a civil penalty case against Mack Trucks Inc., (Mack) on April 8, 1992, in the amount of \$323,872.00 for selling 177 new diesel engines used in heavy-duty trucks that did not meet Federal emission requirements under the Clean Air Act.
- ◆ Completed third year of innovative market-based, voluntary averaging, banking and trading emission credit program for heavy-duty motor vehicle engine manufacturers.

Selective Enforcement Auditing Section

- ◆ Shifted enforcement assembly-line emission testing emphasis from light-duty motor vehicles and trucks to heavy-duty engines which resulted in four heavy-duty audit failures and manufacturer certificate suspensions since 1989.
- ◆ Developed and drafted proposed non-road engine emission enforcement program as directed by the amended Clean Air Act and met with non-road engine manufacturers across country to explain current and future regulatory Federal emission requirements.
- ◆ Audited heavy-duty engine manufacturers' participation in the averaging, banking and trading emission credit program and met with manufacturers to clarify areas of confusion and inequity.

Imports Section

- ◆ Conducted interagency coordination meetings and/or training sessions on federal emission requirements governing imported motor vehicles with the Department of Defense, Department of the Treasury (Customs), and General Services Administration and Department of State.
- ◆ Inspected all Independent Commercial Importers that modify nonconforming motor vehicles imported into the United States which led to several enforcement actions to seek civil penalties under the Clean Air Act.
- ◆ Conducted worldwide survey of the availability of unleaded gasoline to determine whether catalysts installed in U.S. version motor vehicles driven overseas are exposed to leaded gasoline.

Field Operations and Support Division

Field Operations & Compliance Policy Branch

Regional/State/Local Coordination Section

- ◆ Published proposed (July 1991), supplemental (February 1992) and final (October 1992) guidance and regulations for implementation and oversight of state

oxygenated fuel programs for the control of carbon monoxide pollution in 39 metropolitan areas.

- ◆ Published draft (June 1991) and final (December 1991) guidance for the enforcement of vehicle refueling vapor control (Stage II) programs to control the release of vapors that cause ozone (smog) development and prevent human exposure to other harmful emission from gasoline. Notice of availability was published in April of 1992 in the General Preamble to Title I.
- ◆ Coordinated implementation efforts for the oxygenated fuels and Stage II programs by preparing additional policy and guidance documents, other implementation support material, reviewing and commenting on regulations, coordinating training workshops and other support efforts.

Data Management and Analysis Section

- ◆ Developed computer system for states to use in implementing the new wintertime oxygenated fuels programs required under the CAA. Sept. 15, 1992.
- ◆ Wrote analysis of effects of oxygen in gasoline on ambient nitrogen oxide concentrations, for oxygenated fuels program. July 14, 1992.
- ◆ Installed and configured a 60-user local area network to met office automation and data management needs of CAA programs. April 1992.

Plans and Programs Section

- ◆ Conducted the 1992 Tampering Survey in 10 cities with the remote sensor being used in 6 or the 10 cities.
- ◆ Initiated public information efforts to educate the public about revisions to the Clean Air Act.
- ◆ Responded to approximately 4700 telephone calls and correspondence from state governments, regional offices, individuals and vehicle repair facilities regarding emissions control tampering and warranty issues.

Fuels Section

- ◆ Denied, after extensive review, a request by the Ethyl Corporation to allow the use of the manganese-based additive MMT in unleaded gasoline. (January 22, 1992, 57 FR 2535)
- ◆ Expanded the allowable use of aliphatic alcohols and ethers in unleaded gasoline from 2.0 to 2.7 weight percent. (February 11, 1991, 56 FR 5352)
- ◆ Revised the fuel volatility regulations at 40 CFR 80 to allow for more modern testing methods for the measurement of Reid Vapor Pressure.

Investigations and Enforcement Branch

- ◆ Enforced the new volatility regulations throughout the nation by taking over 10,000 samples and issuing numerous notices of violation.
- ◆ Developed, for upcoming publication in the *Federal Register*, enforcement portions of the reformulated gas and anti-dumping regulations.
- ◆ Issued 260 notices of violation with proposed penalties of over \$3.6 million for violations of the fuels and tampering provisions of the Clean Air Act.

Eastern Field Office I

- ◆ Settled first case under the defeat device provision of the Amended Clean Air Act. July 9, 1992.
- ◆ Agreed to a \$600,000 settlement in a lead phasedown case against the Farmers Union Central Exchange (CENEX). September 28, 1992.
- ◆ Issued Question and Answer policy document on the implementation and enforcement of the gasoline volatility regulations. May 1, 1992.

Eastern Field Office II

- ◆ Settled a major lead phasedown case against ARCO for \$500,000.
- ◆ Issued new Tampering and Defeat Device Penalty Policy which incorporates changes in liability and penalty amounts as per the Clean Air Act Amendments.
- ◆ Completed in a timely fashion a new RFP and supported the Contracts Office in the issuance of a new three year inspection contract to address the current and upcoming requirements of the Clean Air Act through FY 1995.

Western Field Office

- ◆ Settled three major lead phasedown cases: Pennzoil/Linmar Seagull (over \$500,000), Joe Jewell (over \$150,000), and Total Petroleum (over \$75,000).
- ◆ Developed guidance for implementing the new administrative litigation process for mobile source cases, as authorized by Section 205 of the amended Clean Air Act.
- ◆ Developed, in cooperation with the Office of Enforcement, delegations regarding enforcement authority under the Clean Air Act, and administrative litigation procedures and policies.

Certification Division

Assistant Director's Staff

- ◆ Coordinated public/industry outreach efforts for the nonroad study. March-November, 1991.
- ◆ Organized a June 1992 CRDA meeting to solicit nonroad advanced emissions reduction technology proposals. Over 50 companies attended representing nonroad industry, states, public universities and private research organizations.
- ◆ Initiated CRDA negotiations with the National Consortium for Emissions Reductions in Lawn Care. Press conference held on August 7, 1992 to announce its formation and plans to evaluate the environmental benefits of electric mowers. Administrator William Reilly welcomed the formation of the Consortium and pledged EPA's commitment to negotiate a CRDA in a timely manner.

Associate Director's Staff

- ◆ Published final rule establishing cold ambient temperature emission standards and compliance procedures for passenger cars and light-duty trucks effective beginning with the 1994 model year. July 17, 1992
- ◆ Published NPRM requiring vehicles to be equipped with on board diagnostic equipment capable of detecting problems likely to cause significant increase in emissions. September 24, 1991.
- ◆ Conducted first industry-wide workshop aimed at organizing efforts and pursuing specific actions to improve vehicle maintenance and repair. August 7 and 8, 1992.

Special Projects Staff

- ◆ Completed and published Section 213A CAA report, Nonroad Engine and Vehicle Study. November 1991.
- ◆ Completed large-scale assessment of actual driving behavior in Spokane, WA, Baltimore, MD, and Atlanta, GA. October 1992.

Certification Support Staff

- ◆ Published both the proposal and final rule implementing model year 1994 and later light-duty tailpipe emission standards ("Tier 1" rulemaking). March 7, 1991 (NPRM); June 5, 1991 (FRM).
- ◆ Transmitted to the Office of Management and Budget the proposal for the Certification Short Test. January 3, 1992.

- ◆ Published the proposed rule and transmitted to the Office of Management and Budget the final rule revising light-duty vehicle emissions durability program requirements. April 30, 1992 (NPRM); October 13, 1992 (FRM transmittal).

Compliance Programs Branch

- ◆ Published final rule for Tier I exhaust emissions standards applicable to 1994 and later model year light-duty vehicles and trucks. June 5, 1991.
- ◆ Published final rule for, and implemented, the collection of fees for mobile source emissions certification and enforcement programs. July 6, 1992.
- ◆ Certified over 700 engine families, processed over 1,000 fuel economy labels, and confirmed 32 CAFE calculations during FY 92.

Program Development & Analysis Branch

- ◆ Achieved workgroup closure on proposed rule for controlling NOx emissions from nonroad engines larger than 50 hp. October 1992.
- ◆ Implemented testing program to investigate effectiveness of various light-duty vehicle Certification Short Test procedures under consideration. December 1991 through November 1992.
- ◆ Fostered and encouraged a cooperative, consensus building relationship with manufacturers of nonroad engines and equipment.

Engineering & Technical Resources Branch

- ◆ Achieved workgroup closure on proposed rule for controlling NOx emissions from nonroad engines larger than 50 hp. October 1992.
- ◆ Published the Regulatory Support Document for the NPRM proposing regulations specifying On Board Diagnostic requirements. September 1991.
- ◆ Developed and patented an OBD catalyst failure detection system; filed February, 1991, Ser.# 07/660654.

Testing Support Team

- ◆ Processed and analyzed approximately 300 emission tests per year in support of Clean Air Act mandated regulations such as Cold CO emission, On Board Diagnostics, and the Federal Test Procedure Study.
- ◆ Reduced the processing burden of applications for Emission Certification of vehicles and engines by Independent Commercial Importers by approximately 50 percent during the 1991 and 1992 model years.

Engineering Operations Division

- ◆ Met all customer needs for emission and fuel economy testing of motor vehicles and analyses of fuels and fuel additives.
- ◆ Constructed two major facilities for future testing and began installation of new dynamometers.
- ◆ Entered into a Cooperative Research and Development Agreement with the major domestic auto companies and the State of California to expand the technology of emission measurements system. This was the first such agreement for OMS.

Testing Programs Branch

- ◆ Exceeded federal test procedure equivalents (FTPE) target by performing 3222 emissions tests on vehicle models at a very acceptable valid rate of 86.7 percent.
- ◆ Initiated rebuilt heavy duty engine testing to an approximate level of 581 FTPE's.
- ◆ Supported other programs such as CNG (compressed natural gas) Challenge, aftermarket PROM program, revised federal test procedure (FTP), Certification Short Test, etc.

Vehicle Testing

- ◆ Due to the high variability of the VNORM values in the REPCA data (data on the variability of vehicle emissions testing equipment), we developed a control charting strategy for the VMIX numbers. On a daily basis, data for each constant volume sampler (CVS) is collected, control charted, and analyzed by the test crew. This practice has paid twofold benefits in that the VMIX analysis, coupled with Tom Schrod's TGI analysis, has resulted in a decrease in CVS drift/variability and the exercise has introduced control chart theory and practice to the test crew.
- ◆ Developed and instituted Technical Training classes for the technicians. This training allowed us to expand the responsibility and expertise of the test crew in order to meet the new testing requirements mandated in the Clean Air Act. Included in this technical program is statistical process control (SPC) training, which has allowed the test team to provide a more active role in the REPCA quality control program.
- ◆ Vehicle Testing accomplished a great deal in the area of Test Procedure updates and developments. One of the major projects completed was a major revision of The Laboratory Computer System (LCS) Test Analysis Program (TAP) Flag Directory. This is a reference document that provides a guide for addressing TAP flag messages encountered by test operators. The TAP Flag Directory was revised to reflect modifications to the TAP software, and has been updated in general.

error messages, changing background concentration limits, and disabling unnecessary warning and notice flags.

Vehicle Acquisition

- ◆ Provided 364 In-Use Vehicles for testing which resulted in 1388 FTPE's which exceeded the in-use FTPE target by 152 FTPE's.
- ◆ Initiated and implemented a new In-Use Vehicle Procurement Contract at a negotiated cost of almost \$10 million for five years. It is NVFEL's first Award Fee Contract.
- ◆ Established as a Work Assignment Manager to the Heavy Duty Engine Contract to increase efficiencies in direction and communications between the Divisions and the contractor.

Heavy Duty Engine Testing

- ◆ Initiated in-use testing program for on-highway heavy duty engines to ensure compliance with applicable emission standards.
- ◆ Initiated the writing of heavy duty engine test procedures that will be read world wide.
- ◆ Established a work assignment manager for more efficient use of the heavy duty contractor.

Fuels and Chemical Analysis Branch

- ◆ Developed superior method allowing for analysis of oxygenated compounds in gasoline in support of the oxy fuels federal guidance to states.
- ◆ Analyzed 2400 gasoline samples in support of the Agency's fuel enforcement program.
- ◆ Continued efforts to complete development of several new methods in support of the Reformulated Gasoline Rule.

Laboratory Engineering Branch

Calibration & Maintenance

- ◆ Maintained quality test equipment and sustained a low equipment void rate to provide for laboratory test operations.
- ◆ Prepared test equipment for specialized test programs such as CNG, FFV and Revised FTP.

- ◆ Relocated test equipment to maintain current test capabilities while accommodating building construction activities.

Facility Services

- ◆ Acquired (soon to be installed) next generation of electric dynamometers to replace existing hydrokinetic dynamometers to meet the challenges, expectations, and requirements of the CAAA.
- ◆ Managed the on-site effort to construct a \$3.5 million cold weather (Cold CO) emissions test facility and an expanded west soak area.
- ◆ Managed an extremely diverse group of work efforts to support the building in the machine shop area, the shipping and receiving and supply area and in the area of facility related projects.

Laboratory Automation

- ◆ Maintained a quality laboratory computer, networking and support services infrastructure.
- ◆ Formally engaged in efforts to downsize minicomputer and mainframe computer systems to microcomputer technology.
- ◆ Developed and implemented usage of new computerized analysis and report tools to support all vehicle testing programs.

Systems Development

- ◆ Developed and coordinated the acceptance testing for the new electric chassis dynamometers and consulted with the industry and other OMS groups on the implementation procedures and plans.
- ◆ Provided extensive review and technical consultation on the construction of the new OMS Cold Test Facility, the implementation of the Cold CO regulations, and the performance testing of the CTF systems.
- ◆ Prepared specifications to procure new sampling equipment, special test facilities, and automated data systems for revised evaporative testing and alternative fuels management. Prepared a comprehensive 3-year plan for equipping the laboratory to meet the needs of the CAAA.

Technical Analysis Branch

- ◆ Improved vehicle test procedures by providing laboratory information to regulation development groups.
- ◆ Lead OMS's activities in providing assistance to Taiwan EPA.

- ◆ Emphasized human resources development by training and professional development activities.

Quality Control

- ◆ Monitored, reported, and facilitated the improvement of EOD's quality improvement efforts.
- ◆ Emphasized TQM style process improvement in EOD documentation methods.
- ◆ Moved toward a paperless information management system for procedure documentation.

Laboratory Projects

- ◆ Represented OMS on the Environmental Research Consortium's Low Level Emission Measurement Panel to develop new technology emission test equipment.
- ◆ Continued a study to measure the variability of emission test equipment during Federal Test Procedure testing.
- ◆ Developed a technique for estimating and reported the number of diurnal enclosures (SHED's) needed to conduct the proposed Federal evaporative emission test.

Correlation & Engineering Services

- ◆ Provided engineering and measurement systems support for Revised FTP testing.
- ◆ Provided timely and comprehensive analysis of the comparison of manufacturer and EPA certification test data, a major component of the role that NVFEL plays in "leveling the playing field" of manufacturer self-certification testing.
- ◆ Implemented statistical process control (SPC) of laboratory diagnostics helping to improve measurement precision by up to 65%.

Director for Regulatory Programs and Technology

- ◆ NGV Challenge -- EPA's contribution to the international student competition of alternative fuel technology was to perform the emissions and fuel economy testing at NVFEL. This was handled successfully by TDG leading to another noteworthy competition and the major sponsors, DOE, GM, and SAE, expressed their gratitude.
- ◆ Thermal Energy Storage -- Saving wasted heat and using it for improving emissions and fuel economy is a desirable goal. TDG searched out and acquired an example of thermal energy storage and in a cooperative program with VW and Schatx

Thermo Engineering, conducted a series of tests using a flexible-fueled vehicle to quantify the emissions and fuel economy benefits of this new technology.

- ◆ Two-Stroke Cycle Engine -- In a cooperative program with the Orbital Engine Company and Ford, TDG conducted a test program to quantify the emissions and fuel economy of two prototype vehicles equipped with direct injection two-stroke cycle engines. Our testing was the first reported outside the industry for this technology.

Regulation Development and Support Division

Engine & Vehicle Regulations Branch

- ◆ Proposed OEM vehicle, conversion and corporate average fuel economy (CAFE) standards for compressed natural gas and other gaseous-fueled vehicles. September 1992.
- ◆ Reached agreement with California Air Resources Board regarding a compromise evaporative emission test procedure which addresses consistency concerns raised by industry. August 1992.
- ◆ Proposed retrofit and rebuild program that achieves emission reductions from in-use urban buses at lowest possible cost. July 1992.

Fuel Studies and Standards Branch

- ◆ Published a supplemental notice of proposed rulemaking reflecting the reg neg agreement reached in 1991 on the mandated reformulated gasoline program. This notice contained the Simple Model for predicting the emissions performance of reformulated gasolines, the Phase I (1995-99) emission performance standards, and the anti-dumping program to maintain emissions performance outside of the reformulated gasoline areas. April 16, 1992.
- ◆ Developed, with the Department of Energy and Agriculture and the White House, a plan for a substantial role for ethanol in the reformulated gasoline program which did not trade off the environmental benefits of the program. The President announced this program at a special press conference on October 2, 1992 at the White House.
- ◆ Proposed an Emission Credits Trading Program for the mandated California Pilot Program. The final rule completed Agency and OMB review in FY92 and will be published in early 1993.

Technology Evaluation & Testing Support Branch

- ◆ Completed certification testing of Chrysler Corporation's first flexible fuel vehicle (FFV). April 1992.
- ◆ Coordinated all testing of 24 U.S. and Canadian student natural gas vehicle designs as part of the 1992 Natural Gas Vehicle Challenge program. May 1992.
- ◆ Developed test procedures for non-road engines and completed baseline testing on small non-road diesels. September 1992.
- ◆ Completed initial testing of emissions and fuel economy effects of high percentage gasoline/ethanol blends (10-40% ethanol). September 1992.

Special Regulatory Projects Branch

- ◆ Published proposed rule on health effects and emission testing as a requirement for fuel and fuel additive registration. April 15, 1992.
- ◆ Published final rule for the Clean-Fuel Fleet Program establishing a credit program, exemptions from transportation control measures, and new program to encourage the production and purchase of very clean vehicles. (Announcement scheduled for October 19, 1992)
- ◆ Achieved internal Agency concurrence for the notice of proposed rulemaking for the Clean-Fuel Fleet Program covering heavy-duty emission standards, converted vehicles, and other provisions. (Closure meeting October 14.)
- ◆ Published final decision document not to require onboard recovery of fuel refueling emissions, thus opening the way for implementation of Stage II controls in affected non-attainment areas. April 15, 1992.

Emission Planning and Strategies Division

Technical Support Branch

- ◆ Issued guidance on how to prepare mobile source emission inventories including motor vehicles and non-road engines. Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources. July 13, 1992.
- ◆ Supported new inspection maintenance proposed rulemaking for new high tech I/M programs and published an evaluation of remote sensing devices for I/M. Evaluation of a Remote Sensing Device at a Centralized I/M Lane. Society of Automotive Engineers Paper 922315. October 1992.
- ◆ Compiled draft report on air toxics emissions from motor vehicles. Motor Vehicle-Related Air Toxics Study. July 1992.

State Support & Regulatory Analysis Section

- ◆ Published guidance on how to forecast and track vehicle miles traveled (VMT), *Federal Register* Notice. Section 187 VMT Forecasting and Tracking Guidance. March 19, 1992.
- ◆ Issued guidance on how to prepare mobile source emission inventories. Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, July 13, 1992.
- ◆ Initiated review of mobile source sections of draft 1990 SIP base year emission inventory submittals. These sections include highway vehicles, nonroad engines and vehicles, locomotives, aircraft, and vessels. Final inventories are due November 15, 1992.

Engineering Section

- ◆ Developed technical guidance, equipment specifications, and quality control recommendations for the new high-tech Inspection and Maintenance (I/M) programs (i.e., transient dynamometer test and evaporative system checks). A draft technical report was available when the Notice of Proposed Rule Making (NPRM) was published on July 13, 1992. Provided various analyses relative to repairs and alternative test procedures for the Technical Support Document required for the rulemaking process. July 1992.
- ◆ Initiated a series of industry standards for a common diagnostic plug, communication language, trouble codes, and tools which were adopted by the Society of Automotive Engineers (SAE) in 1992. Improved methods to identify malfunctioning oxygen sensors and catalysts are currently in-progress. Fabricated components for inexpensive repair-grade high-tech emissions test equipment. June 1992.
- ◆ Published a report on the second test program conducted by the section comparing remote sensing technology to existing I/M procedures (October 21, 1992, SAE No. 922315). Completed a third evaluation of remote sensing on September 30, 1992, which was the second program by the section that compared remote sensing to the high-tech I/M program. September/October 1992.

Pollutant Assessment Section

- ◆ Developed a motor vehicle exposure model, titled HAPEMMS, that calculates national annual average exposure to vehicle pollutants as a function of g/mile emission factors. Annual average exposure information is required to perform cancer risk assessments. Report: Application of the HAZARDOUS Air Pollutant Exposure Model to Mobile Source Pollutants, January 1992.
- ◆ Developed the methodology and prepared nonroad equipment emission inventories for 33 ozone and/or carbon monoxide nonattainment areas, as input for SIP

inventories. Inventories were derived at both the county and areawide level and reflect the updated CO and ozone nonattainment boundaries. The inventories contain information for 79 equipment types within each of three engine types. Draft report - Methodology to Calculate Nonroad Emission Inventories at the county and sub-county level. July 1992.

- ◆ Prepared first version of the motor vehicle-related air toxics report required by the Clean Air Act. This 600-plus page report contains the latest information on health effects, emission factors, exposure, and cancer risk for motor vehicle air toxics. July 1992.

Emission Control Strategies Branch

- ◆ Published final rule setting performance standards for enhanced vehicle inspection programs. November 6, 1992.
- ◆ Published guidelines for transportation/air quality planning and transportation control measure information. Spring/Summer 1992.
- ◆ Developed procedures for inventorying emissions from aircraft and locomotives. Summer 1991.

Transportation Section

- ◆ Published guidelines for transportation/air quality planning and transportation control measure information. Spring/Summer 1992.

I/M Section

- ◆ Published final rule setting performance standards for enhanced vehicle inspection programs. November 6, 1992.

Special Projects Section

- ◆ Developed procedures for inventorying emissions from aircraft and locomotives. Summer 1991.

Air Quality Analysis Branch

- ◆ Released the draft version of the MOBILE5 emission factor model for use in development of emission inventories for State Implementation Plans. August 28, 1992.
- ◆ Set up an IM240 demonstration site in a Phoenix Inspection and Maintenance (I/M) lane for the North American Motor Vehicle Emissions Control Conference (NAMVECC), and successfully illustrated that the high-tech test is feasible for I/M programs. May 1992.

- ◆ Performed 583 reformulated fuels tests on 40 vehicles to provide information on effects of different fuel properties on automobile emissions. December 1991 through September 1992.

Model Development Section

- ◆ Released the draft version of the MOBILE5 emission factor model for use in development of emission inventories for State Implementation Plans. August 28, 1992.
- ◆ Rewrote and expanded the Tech 5 emission model used to estimate Inspection and Maintenance Program emission benefits to include NOx emissions and IM240 transient testing procedures. March 1992.
- ◆ Developed a methodology to use IM240 transient testing results from testing at Inspection and Maintenance program sites to estimate in-use vehicle emission factors. July 1992.

Testing and Data Management Section

- ◆ Performed analyses supporting the Inspection and Maintenance (I/M) rule which improves our ability to identify high-tech cars and trucks that need repairs. November 1991 and September 1992.
- ◆ Set up an IM240 demonstration site in a Phoenix I/M lane for the North American Motor Vehicle Emissions Control Conference (NAMVECC), and successfully illustrated that the high-tech test is feasible for I/M programs. May 1992.
- ◆ Performed 583 reformulated fuels tests on 40 vehicles to provide information on effects of different fuel properties on automobile emissions. December 1991 through September 1992.

OFFICE OF POLICY ANALYSIS AND REVIEW

- ◆ Played a key role in EPA's efforts to obtain Administration support and Congressional approval of the new Clean Air Act. OPAR staff participated in virtually all of the White House/EPA and Congressional/Administration meetings leading to passage of the Act.
- ◆ Led the effort to document the benefits and costs of the 1990 Clean Air Act (including business and export opportunities and new jobs) and sponsored the very successful Clean Air Act Marketplace Conference.
- ◆ Assisted the other OAR offices in developing and securing support for key regulations and programs (e.g., permits, continuous emissions monitoring for powerplants, and the innovative Regional Clean Air Incentives Market (RECLAIM) in Southern California). Represented OAR on EPA's Steering Committee and developed and taught course on regulatory development to OAR staff.
- ◆ Coordinated international activities for OAR and served as head of delegation for several Long-Range Transport of Air Pollution (LRTAP) negotiations.
- ◆ Led OAR participation in important agency-wide efforts such as the petroleum refinery cluster, environmental equity task force, and the Deputy Administrator's Regulatory Improvement Initiative.

OFFICE OF PROGRAM MANAGEMENT OPERATIONS

National Programs Staff

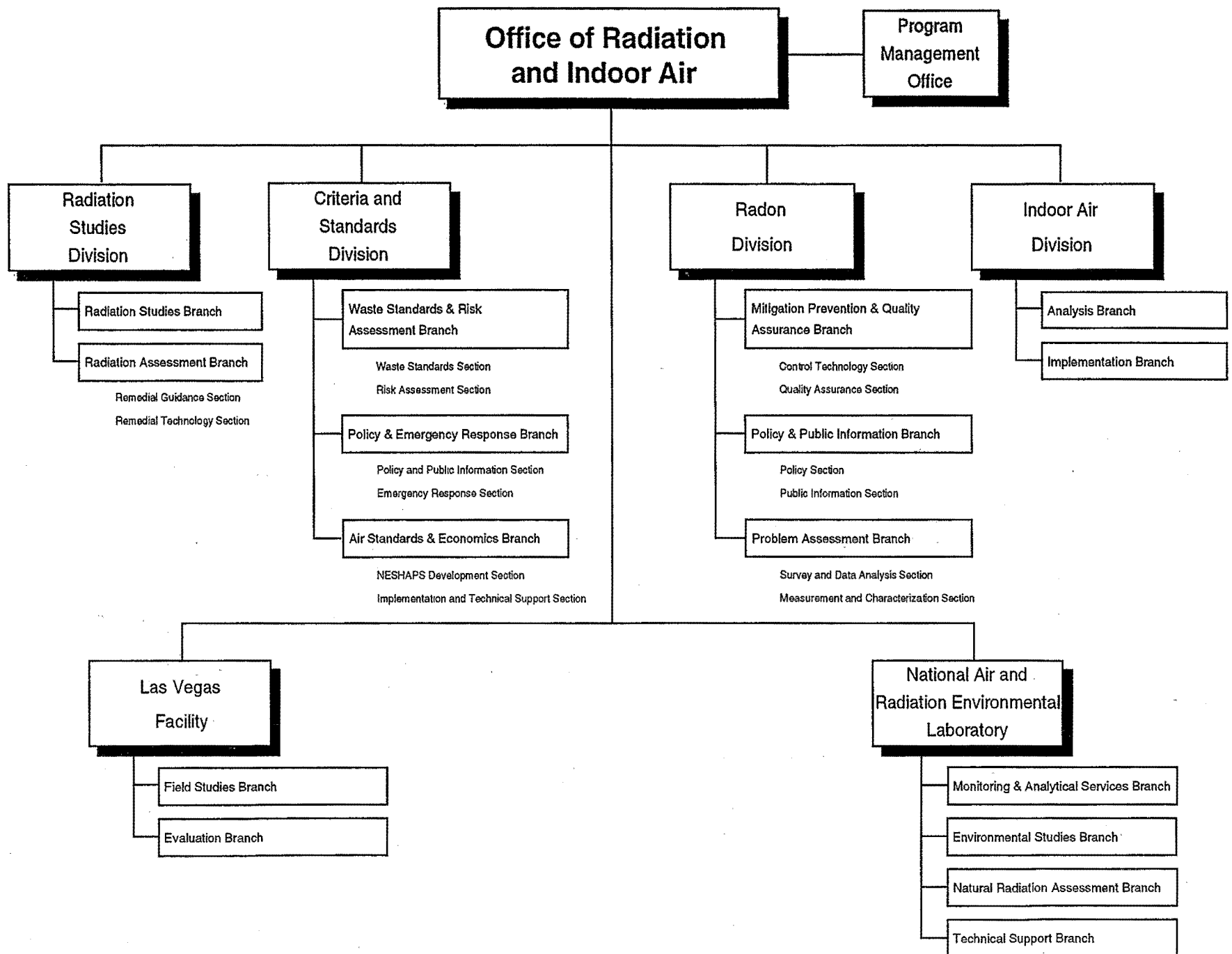
- ◆ Provided staff support for the Clean Air Act Advisory Committee, who advise senior OAR and Agency policy makers on major issues affecting implementation of the Clean Air Act. The Committee issued three publications: "A Primer on Consensus Building," "An Introductory Guide to Smart Implementation," and "A Guide to Public Financing Options." November 1990 - Present.
- ◆ Established a new consensus-building, consultative process for allocating state air grant funds to EPA regional offices. Since the signing of the Clean Air Act, EPA has increased the amount of state grants by 76 percent to \$175 million. February 1990 - Present.
- ◆ Organized annual reviews by the Deputy Assistant Administrator and an OAR management team for the ten regional offices to assess implementation of air and radiation programs and assist in resolving program issues. 1991 - Present.

Resource Management Staff

- ◆ Established an OAR Resource Management Council with representatives from each OAR program to help ensure effective internal resource use, provide guidance on external resource management issues, and respond to OMB, Congressional and Agency budget directives.

Budget and Planning Staff

- ◆ Managed development of budget request leading to a 93 percent budget increase for implementation of the Clean Air Act. The OAR budget data system, which provides for detailed tracking of Clean Air Act programs and Agency themes and initiatives, has served as a model for other Agency offices. 1991 - Present.
- ◆ Coordinated development of a new OAR-regional management process that includes: identification of national and regional priorities, negotiation of Memoranda of Agreement (MOAs), and reporting of implementation progress. The MOAs, which are signed by the Assistant Administrator and Regional Administrators, include an agreed upon set of activities that implement the national and regional priorities. The MOA process has also served as a model for other agency offices. 1991 - Present.
- ◆ Developed and coordinated improved systems for tracking implementation progress under the Clean Air Act, including the Office of Air and Radiation Management System (OARMS) and an MOA Reporting System for tracking regional progress in meeting MOA commitments. The budget and Planning Staff also prepared the second two-year "Implementation Strategy for the Clean Air Act Amendments of 1990." 1991 - Present.



OFFICE OF RADIATION AND INDOOR AIR

Criteria and Standards Division

- ◆ Issued NESHAPs for radionuclides on October 31, 1989.
- ◆ Published guidance to states on actions to protect the public from radiological accidents and emergency in November 1991.
- ◆ Surveyed the radiation risks from air emissions from NRC-licensees in the spring of 1992 and estimated that over 99 percent were less than the acceptable level of 10 mrem/yr.

Radiation Studies Division

Radiation Assessment Branch

Remedial Guidance Section

- ◆ Developed, for Superfund, Risk-Based Preliminary Remediation Goals for Radioactive Contaminants. December 1991.
- ◆ Established an ongoing radioactive material cleanup program with the Department of Energy for Technical Cooperation in the areas of: Criteria and Guidance Development, Site-Specific Assessments, Environmental Monitoring and Quality Assurance/Control, Technology Development Support for Clean-up/Waste Minimization, Training.
- ◆ Established cooperative program with the Department of Defense to facilitate cleanup of radioactive contamination at active military installations and those preparing for closure.

Remedial Technology Section

- ◆ Initiated, in cooperation with the office of Administration and Resource Management, a comprehensive program to protect the Safety and Health of EPA employees who deal with radioactive materials. May 22, 1991.
- ◆ Successfully tested a pilot plant designed to treat radioactive soil from the Montclair, NJ Superfund site. September 30, 1992.

Radiation Studies Branch

- ◆ Developed and published two public outreach documents:
 - *Questions and Answers About Electromagnetic Fields* [Working Draft], August 1992

- ◆ Supported (in part by grant) the publication of the SCIENCE magazine article entitled: "Containing Costs of the EMF Problem," by Keith Florig. July 1992.
- ◆ Published for presentation at the 85th Annual Air and Waste Management Association meeting the paper entitled: "Personal 24-Hour Magnetic Field Exposures. Lynne Gillette and Doreen Hill. June 1992.

Las Vegas Facility

- ◆ Completed and began distributing CAP88-PC, version 1.0, a software package to determine dose from radionuclide emissions to air from Department of Energy (DOE) facilities. Over 600 copies of CAP88-PC were distributed to scientists in State agencies, DOE facilities, industry and academic institutions in 1992.
- ◆ Verified dose calculations for Los Alamos Mason Physics Facility (LAMPF), as part of NESAHPS audit of Los Alamos National Laboratory at request of EPA region 6.
- ◆ Assessed Yucca Mountain, Nevada, site for dose and risk resulting from carbon-14 emissions from proposed geological repository for high-level nuclear waste.
- ◆ Performed a collaborative laboratory study with the International Atomic Energy Agency (IAEA) to test integrating radon detectors under severe environmental conditions. The results of the study will be used to select measurement devices for the IAEA "Radon in the Human Environment" worldwide indoor radon study.
- ◆ Performed the National Ambient Radon (NAR) Study as mandated by Title III of the Indoor Radon Abatement Act, Section 303 (3). Results of the study were published and presented at the 1991 International Symposium on Radon and Radon Reduction Technology.
- ◆ Established a Radon Instrument Evaluation Program that to date has performed over 100 instrument evaluations. The program qualifies measurement devices and instruments for participation in the National Radon Measurement Proficiency Program (RMP).

National Air and Radiation Environmental Laboratory

- ◆ Established a Technical Support Center (TSC) at the National Air and Radiation Environmental Laboratory to provide technology-based assistance to Superfund cleanup sites. March 1992.

- ◆ Completed phase one in establishing a mixed waste analytical capability, including personnel identification, design of laboratory space requirements, and purchase of key instrumentation. September 1992.
- ◆ Began functioning as a collaborating center for the World Health Organization's Global Environmental Radiation Monitoring Network, an international monitoring initiative begun in response to Chernobyl. April 1992.

Radon Division

- ◆ Established national coalition of public health, consumer protection, building and real estate organizations to reduce the public health risks of radon. The Radon Division has brought together organizations as diverse as the National Association of Counties, the American Lung Association, the Ad Council, and the National Association of Homebuilders to raise public awareness of radon to nearly 70 percent and reduce public health risks from radon. Already, nearly 10 percent of American homes have been tested, hundreds of thousands have been fixed, and well over a hundred thousand new homes have been built with radon resistant features.
- ◆ Ensured quality radon testing and mitigation services for the American public. The Radon Division's revamped measurement device proficiency program (1990) and new proficiency programs for individual testing and mitigation contractors (1991), coupled with the new *Citizen's Guide to Radon* (1992), have provided citizens with sound advice and services to address radon problems.
- ◆ Refined EPA's radon health risk assessment and established national estimates of the extent of radon problems in homes and schools. The Radon Division completed national surveys of radon levels in homes (1991) and schools (1992) and, in cooperation with the National Academy of Sciences and the Science Advisory Board, revised its national radon risk estimate to 7,000 to 30,000 annual lung cancer deaths attributable to residential radon exposures (1991).

Indoor Air Division*

Analysis Branch

- ◆ Developed a policy strategy brochure on EPA's Indoor Air Pollution program describing the Agency's multifaceted approach to reducing citizen's exposure to indoor pollutants. September 1992.
- ◆ Completed and distributed the architect's primer, *Designing for Good Indoor Air Quality*. November 1991.

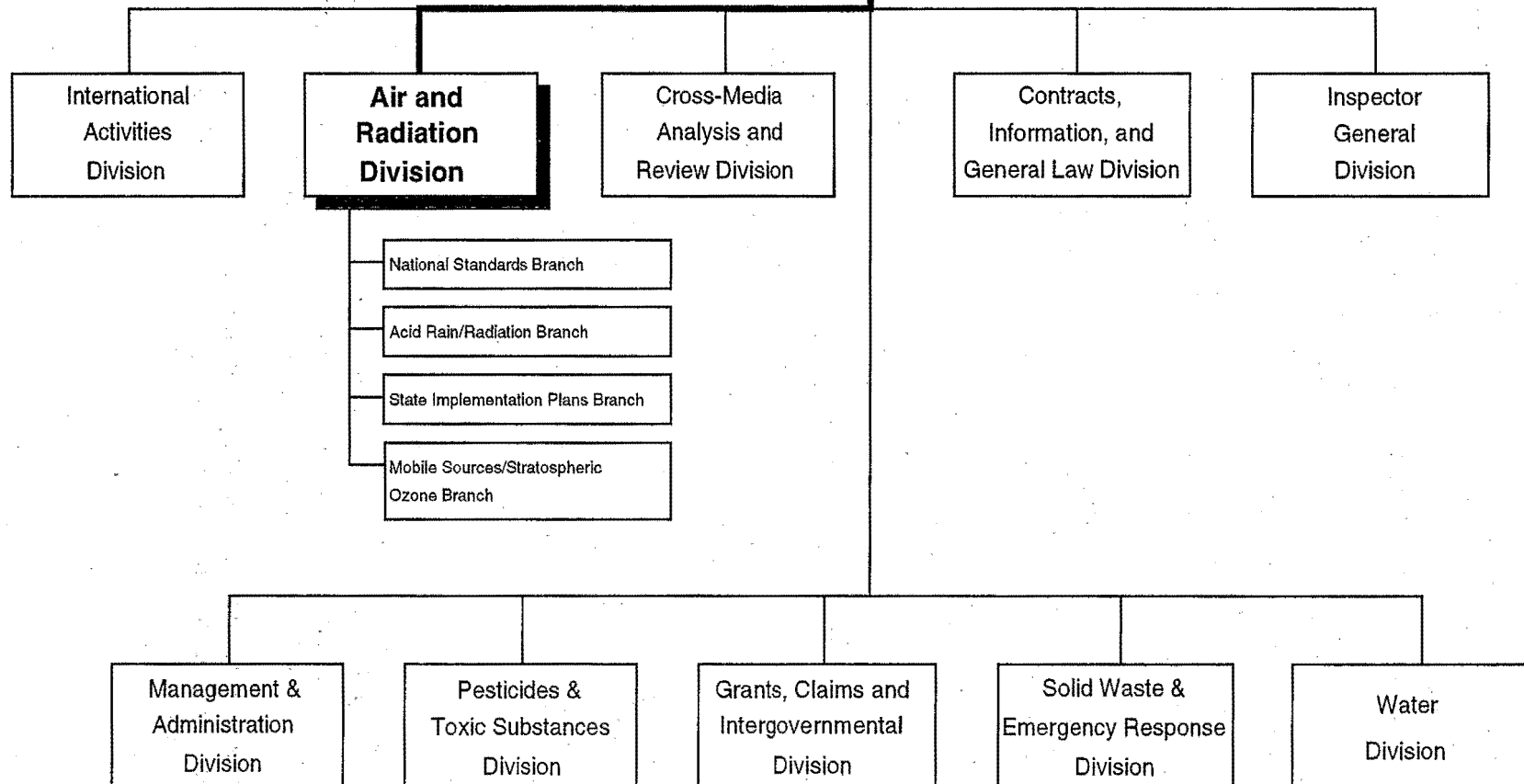
* The Indoor Air Division was part of the Office of Atmospheric and Indoor Air Programs (now the Office of Atmospheric Programs) when these activities were conducted.

- ◆ Developed the Building Assessment Survey and Evaluation (BASE) program to investigate and study indoor air quality in office buildings. As of October 1992, the BASE survey was at Office of Management and Budget awaiting clearance.

Implementation Branch

- ◆ Completed and distributed an indoor air quality guide *Building Air Quality: A Guide for Building Owners and Facility Managers*. The guide was issued jointly by EPA and the National Institute of Occupational Safety and Health. February 1992.
- ◆ Developed orientation course for building owners and managers to acquaint them with the Building Air Quality Guide. Delivered course nationwide in cooperation with the Building Owners and Managers Association. Ongoing 1992.
- ◆ Provided "Orientation to Indoor Air Quality" course to 1200 state and local environmental and public health officials nationwide. Ongoing 1992.

Office of General Counsel



OFFICE OF GENERAL COUNSEL

Air and Radiation Division

- ◆ Principal legal advisors to the Agency's air and radiation programs and others concerned with the implementation of the Clean Air Act.
- ◆ Principal drafters, under policy guidance of OAR, of President's proposed amendments to the Act that were ultimately enacted, with changes, as the Clean Air Act Amendments of 1990.
- ◆ Principally responsible, with the Department of Justice, for the defense of litigation under the Clean Air Act and other statutes affecting Air and Radiation programs.
- ◆ As part of that responsibility, have successfully settled numerous lawsuits brought against the Agency alleging failure to comply with statutory deadlines to promulgate a number of rules.

National Standards Branch

- ◆ Provided extensive legal support to OAR in the development of the operating permit program regulations. This extraordinarily complex and important regulation is expected to supply the framework for the implementation of the various programs affecting stationary sources under the Clean Air Act amendments. Many of the controversial issues involve novel questions of legal interpretation. Currently working with the Department of Justice to orchestrate a defense of the rule against a wide ranging series of challenges in court.
- ◆ Assisted OAR with proposed regulations for the organic chemicals industry (the Hazardous Organics NESHAP or HON). Helped OAR devise a legal strategy that would allow for the use of a broad bubble approach for compliance with emissions standards for the organic chemicals manufacturing industry. The bubble approach is associated with considerable cost savings, and is expected to become the template for subsequent MACT standards issued under the air toxics program.
- ◆ Provided legal support on an ongoing basis to assist OAR in the implementation of Clean Air Act air toxics programs. For example, played a key role in the early reductions rule, which provides incentives for industry to reduce emissions of air toxics well before the required MACT standards go in place. Also heavily involved in all the rulemakings being undertaken in the air toxics area. Exploring with OAR ways to integrate the air toxics program with the permits program.
- ◆ Played a major role in developing strategies for settling lawsuits based on EPA's failure to meet statutory deadlines for review of the ozone NAAQS and the SO₂ NAAQS.

Acid Rain/Radiation Branch

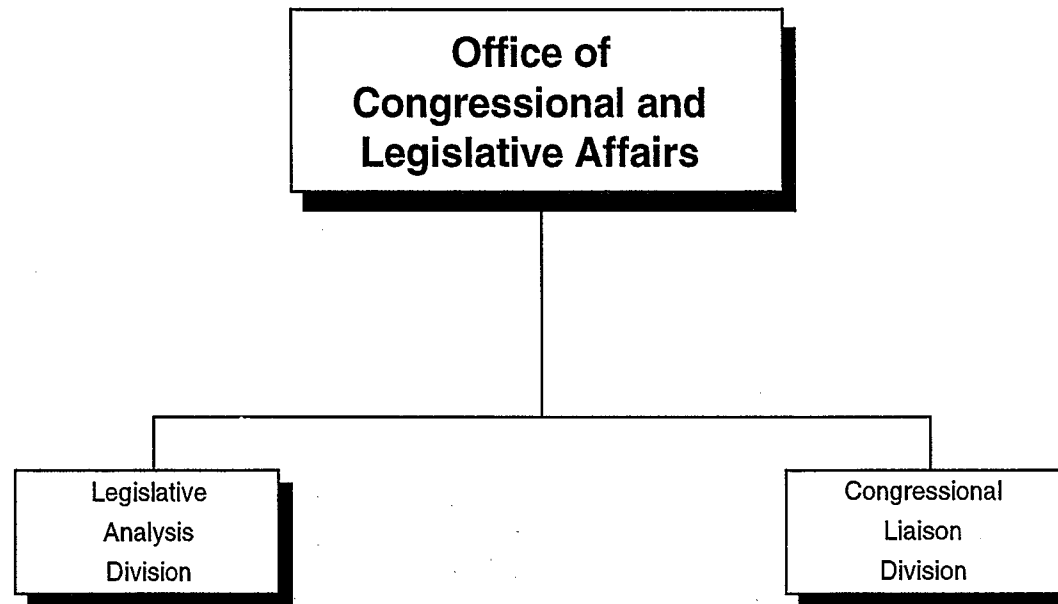
- ◆ Provided extensive counseling services to Acid Rain Advisory Committee, which was instrumental in laying foundation for acid rain program, and provided in-depth assistance in drafting acid rain rules and negotiating with Administration during interagency review.
- ◆ Worked closely with air program staff to develop guidance documents implementing revised new source review provisions of 1990 Amendments, and was instrumental in negotiating "WEPCO" rule within the Administration.

State Implementation Plans Branch

- ◆ Teamed up with OAR staff to produce the Title I General Preamble, the first comprehensive guidance for States and the public on how to implement the State Implementation Plan (SIP) provisions of the 1990 Clean Air Act Amendments. Took an active role in creating interpretations of the Title I provisions that maximize the States' flexibility while still advancing the goals of the new statute. Instrumental in negotiating the provision of the General Preamble within the Administration.

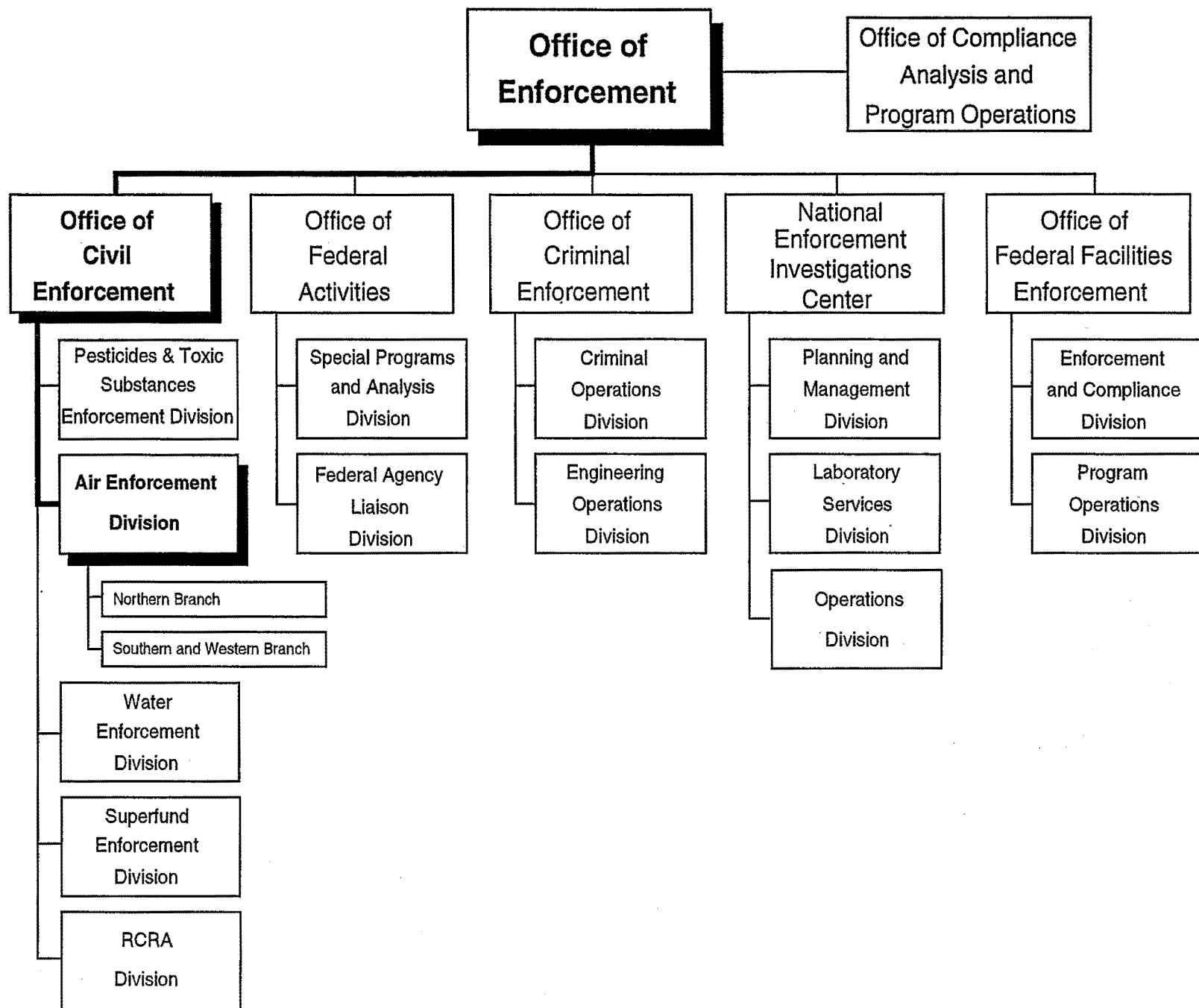
Mobile Sources/Stratospheric Ozone Branch

- ◆ Played a key role in the reformulated gasoline regulatory negotiation. These exceedingly complex negotiations led to an agreement signed by all the relevant interests, including environmental groups and industry, that achieved the sought-for environmental gains of the program at the lowest cost, and included innovative trading and averaging provisions for that purpose.
- ◆ Helped develop the CFC phaseout rules. The provisions of these rules needed to be developed in large part by OGC, in part because of difficult legal problems in reconciling the requirements of the 1990 Amendments to the Clean Air Act with the requirements of the Montreal Protocol. OGC's contribution assured that the rules were issued on time to provide the needed guidance to the regulated community.



OFFICE OF CONGRESSIONAL AND LEGISLATIVE AFFAIRS

- ◆ Assisted in the design of a comprehensive legislative strategy to reauthorize the Clean Air Act in a fashion consistent with the Administration's prerogatives. Aided in the formation of the Administration's initial Clean Air proposal by determining congressional sentiment on a variety of policy options. Recruited congressional cosponsors for the Administration's Clean Air proposal to Congress. (February 1989 - July 1989).
- ◆ Established bipartisan consensus-building relationships in the Congress during Clean Air Act reauthorization to help shape effective and balanced regulatory policy. Coordinated the exchange of communication between the Agency and Capitol Hill. Closely monitored and documented congressional activity throughout reauthorization. (July 1989 - November 1990).
- ◆ Communicate the Clean Air Act implementation to members of Congress and their staff in a manner which enhances support for the Administration. Assist in the preparation of Agency witnesses who go before Congress to testify in oversight and investigative hearings. Provide Clean Air Act briefings and implementation documents to the Congress on a routine basis. (November 1990 - present).



OFFICE OF ENFORCEMENT

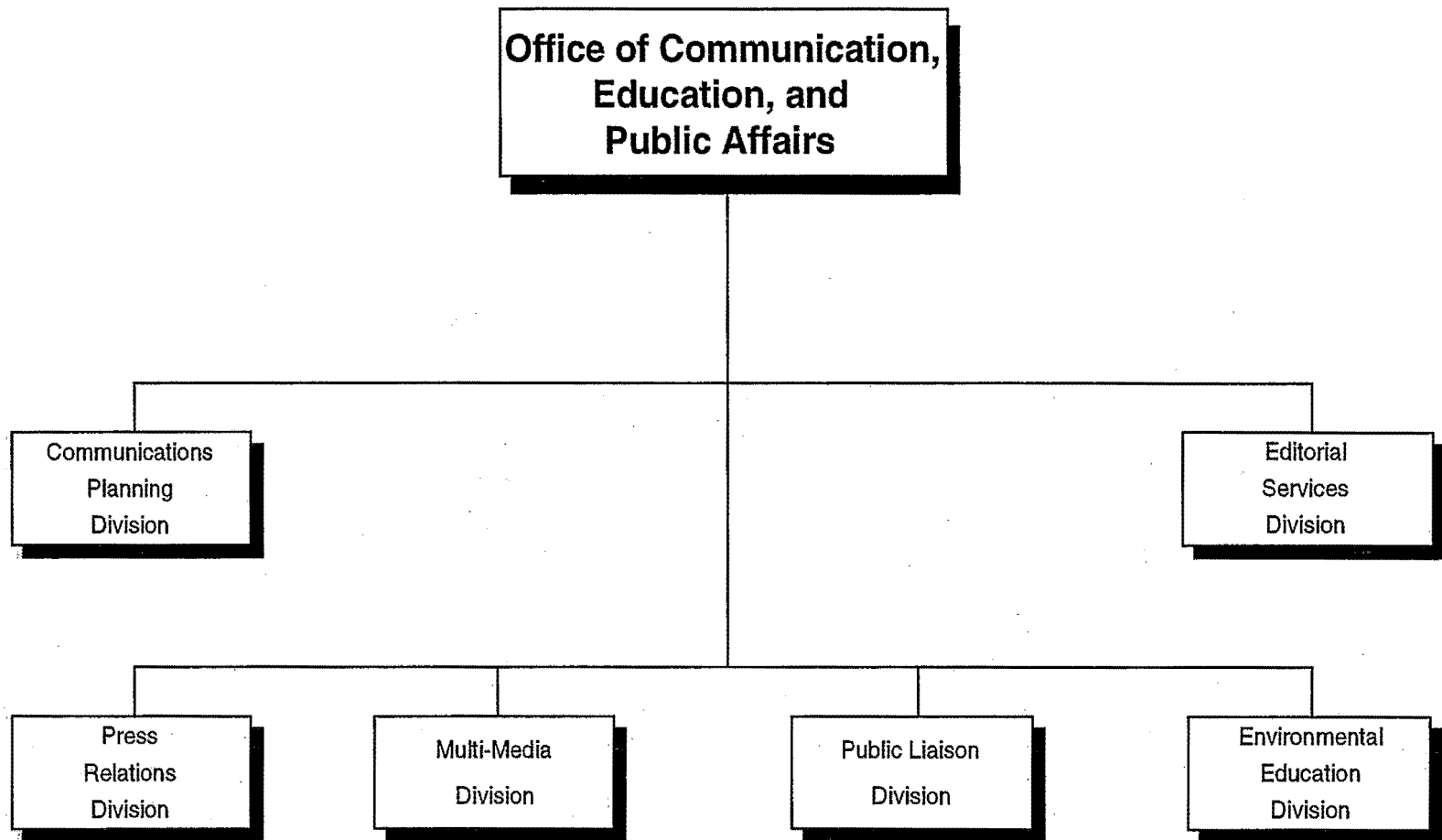
Air Enforcement Division

Northern Branch

- ◆ Coordinated August 22, 1989 Asbestos Enforcement Initiative in which seven Regions filed 13 civil actions simultaneously against 34 named defendants at over 100 different sites nationwide alleging violations of the Clean Air Act's asbestos NESHAP pertaining to demolition and renovation operations. This critical area requires a strong enforcement effort if the Agency is to ensure acceptable levels of compliance.
- ◆ Played significant role in the drafting of title VII of the Clean Air Act Amendments of the 1990, the provisions which enhanced the Agency's enforcement authorities.
- ◆ Supplied a number of CAA cases to the August 5, 1992 cross-media Benzene Initiative prosecution and settlement of which will result in significant reductions of the amount of this hazardous chemical emitted to the air. Two of these cases have already been settled, resulting in penalties of \$1.3 million.

Southern and Western Branches

- ◆ Pursued and settled as lead enforcement office seven actions against importers of chlorofluorocarbons (CFCs). Five actions were filed simultaneously as part of the June 29, 1990 CFC importer enforcement initiative. These efforts recovered almost \$400,000 in penalties and forced the violators to cure the potential environmental harm from illegal importation of more than 230,000 kilograms of ozone-depleting chemicals.
- ◆ Won an important ruling in federal district court that contractors who operate federal facilities can be held liable for their violations of the Clean Air Act. Following the January 3, 1991 ruling, a defense contractor paid a penalty of \$350,000 to settle EPA's action alleging CAA violations at a fighter plane manufacturing facility. The contractor had enjoyed no economic benefit from its noncompliance because the Air Force was responsible for all costs of installing control equipment.
- ◆ Coordinated nationwide filing of 52 Clean Air Act administrative penalty cases seeking more than \$4 million in penalties for a variety of violations. Filed on May 20, 1992 in 26 States and Puerto Rico, the cases marked the first use of new administrative enforcement authority granted by the new Clean Air Act. Administrative penalty actions, with their streamlined litigation procedures, allow EPA to expend moderate resources on middle-range but important cases, and to reserve more resources for judicial litigation in larger, more complex cases.



OFFICE OF COMMUNICATIONS, EDUCATION, AND PUBLIC AFFAIRS

Communications Planning Division

- ◆ Directed production of a publication on air pollution issues for a lay audience to inform them and convince them that they can make a significant contribution to the solution of air pollution problems. November 1992.

Public Liaison Division

- ◆ Informed affected members of the public about OAR regulations and other announcements. Made sure that they received copies of the regulations and background information in a timely fashion. Responded to public inquiries. Ongoing.
- ◆ Conducted targeted outreach effort on the drycleaner NESHAP through appropriate trade press and trade associations, including facilitating translation into appropriate languages. November, 1991.
- ◆ Created linkage between EPA and the American Automobile Association, leading to partnerships on many OAR mobile source issues. Acted as a catalyst for continued cooperation. Ongoing.
- ◆ Provided ongoing support, recommendations, and marketing to advance OAR's voluntary initiatives (e.g., "Green Lights" and "Energy Star" computers). Ongoing.

Press Relations Division

- ◆ Helped OAR reach targeted audiences through the daily and trade press, magazines, television, radio, and other media channels with major OAR announcements. Ongoing.

Editorial Services Division

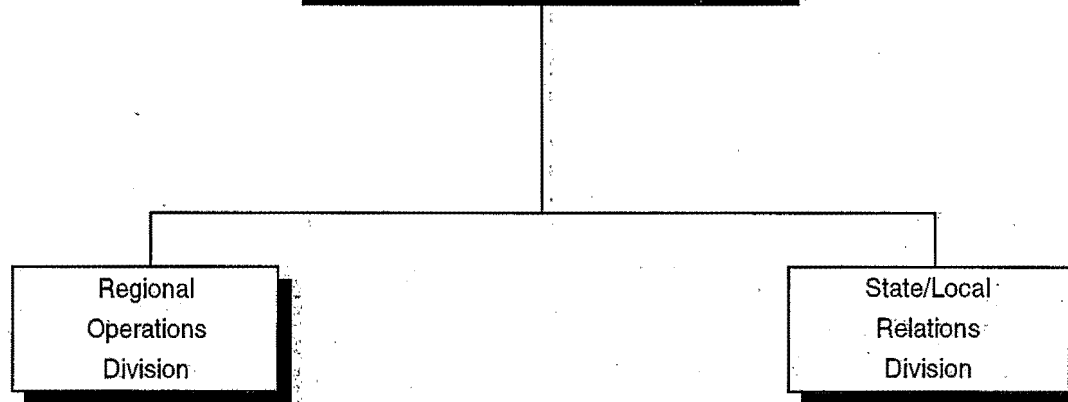
- ◆ Reviewed, edited, and helped with graphics, layout, and production of numerous OAR publications. Ongoing.
- ◆ Featured several major air issues in "EPA Insight", the EPA employee newsletter. August, 1992.

Multi-Media Division

- ◆ Reviewed and provided communications advice on radio and TV public service announcements and videotapes. Ongoing.

- ◆ Coordinated production of nine ABC radio spots with interviews of top OAR personnel on various air issues. July and August, 1992.

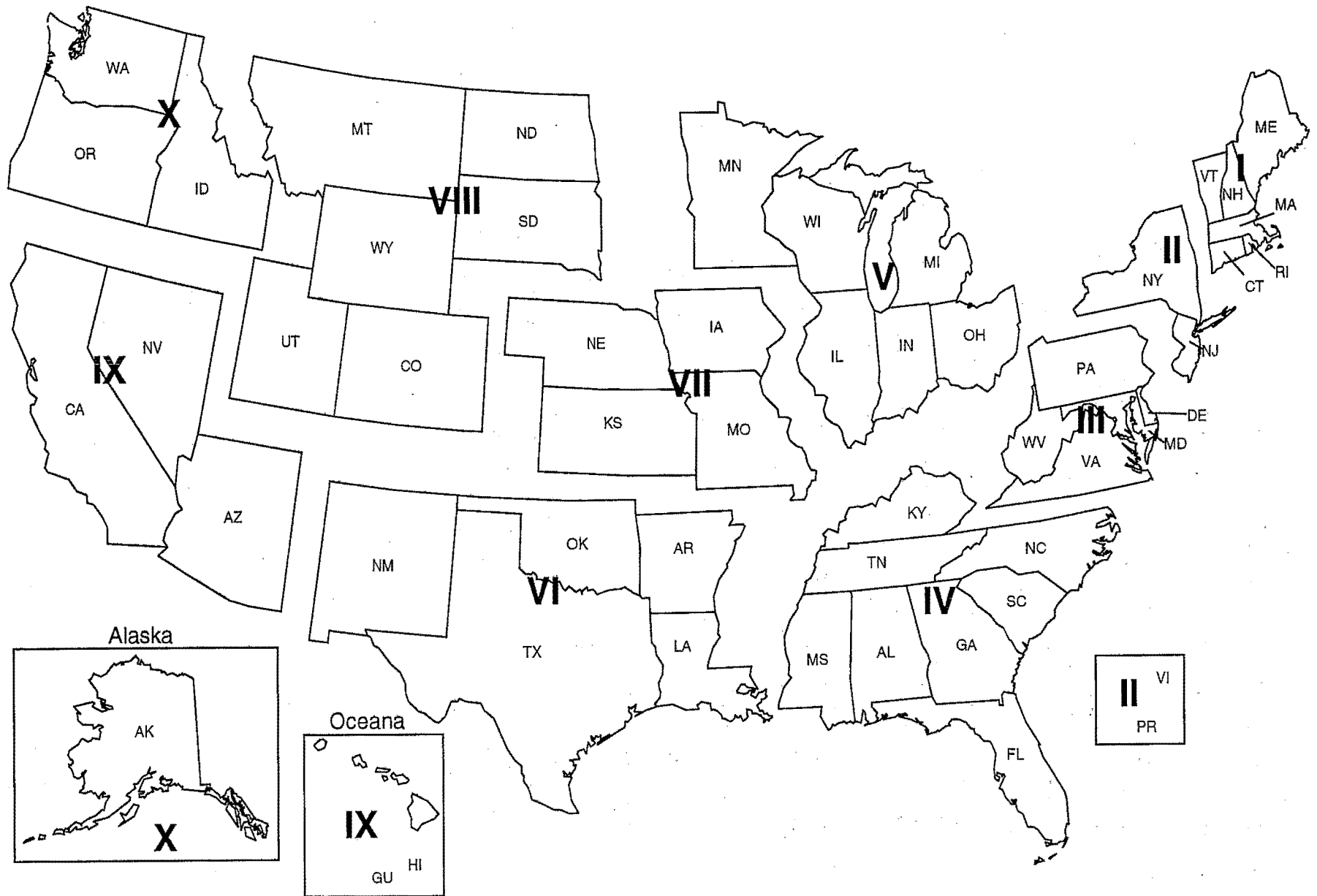
**Office of
Regional Operations and
State/Local Relations**



OFFICE OF REGIONAL OPERATIONS AND STATE/LOCAL RELATIONS

- ◆ Informed state and local governments, associations and D.C. state officials about OAR regulations and major announcements. Helped them reach these targeted audiences through constituent briefings, by facilitating meetings with intergovernmental representatives and by arranging OAR representation at association meetings. Ongoing.
- ◆ Reviewed and edited numerous OAR publications. For example, twelve booklets, five leaflets, three fact sheets and several TV, radio and videotape PSAs. Ongoing.
- ◆ Reviewed and provided communications advice on the regional and intergovernmental aspects of most OAR communications strategies. Ongoing.

EPA REGIONS



REGION I -- BOSTON, MASSACHUSETTS

Air, Pesticides and Toxics Management Division

- ◆ Active, intra-Division CFC outreach efforts included over 30 presentations at workshops across New England to industry groups, state and municipal officials and citizen groups; mailing of Region I - developed information packet to several hundred groups, companies and individuals requesting CFC information; outreach strategy under preparation will include two major CFC conferences in FY93. FY92.
- ◆ Region greatly improved relationships with state and federal transportation officials by holding meetings in five states to discuss conformity submittals, conducting three workshops on mobile source programs and modeling to more than 100 state and federal highway and environmental staff, and holding meetings in three states to discuss appropriate uses and documentation for CMAQ funds. FY92.
- ◆ Working with the Region, states made substantial progress in adopting RACT regulations for VOC sources and in submitting draft base year emissions inventories between May and August of 1992.
- ◆ The launching of Region I compliance monitoring enforcement initiatives resulted in nine administrative orders and two administrative penalty orders targeted at NSPS commercial boilers, sewage sludge incinerators, NESHAP benzene facilities; municipal waste combustors, pulp and paper facilities and miscellaneous metal parts operations. March 1992.
- ◆ Joint conference with MIT brought together corporate and utility company executives, academia, states and environmental groups, Administrator Reilly and Governor Weld to kickoff ENERGI (EPA North East Region Green Initiatives) highlighting market-based, voluntary energy efficiency including Green Lights, Golden Carrot Super Efficient Refrigerator Program and Energy Star Computer Program, and generated commitments to these initiatives. May 1992.

REGION II -- NEW YORK, NEW YORK

Air and Waste Management Division

- ◆ Undertook an initiative under the Air Toxics Early Reduction Program, involving the largest chlorofluorocarbon producer in the country and another facility, that resulted in the planned reduction of 1.5 million pounds in air toxics emissions. (August, 1992)
- ◆ Completed a report on a project that evaluated air quality and health risks in the Staten Island, New York and northern New Jersey areas. (September 30, 1992)
- ◆ Took enforcement action against a major steel facility for improper removal of thousands of square feet of asbestos that resulted in the largest penalty ever assessed against an asbestos source to date (\$6.9 million). (January, 1992)
- ◆ Undertook a pollution prevention initiative that resulted in actual emissions reductions of 10-90% at ten facilities and a commitment by five facilities to achieve 50-90% emissions reductions by 1995. (July, 1991)
- ◆ Took enforcement action against six of the largest bakeries in the Region, resulting in anticipated penalty collections of over \$1 million and reduction of volatile organic compounds in excess of thousands of tons. (September, 1991)
- ◆ Recruited 84 participants in the Green Lights program, including 7 of the Region's 13 electric utilities, 10 Fortune 500 companies, 8 colleges, and one Territorial government.** (September 30, 1992)

REGION III -- PHILADELPHIA, PENNSYLVANIA

Air, Radiation and Toxics Division

- ◆ Performed thousands of hours of outreach initiatives under the Clean Air Act Amendments.
- ◆ Provided written comments on over 110 draft and proposed state regulations and testified at more than twenty public hearings. As a result, Region III anticipates completion of upwards of 90 percent of the submittals due November 14, 1992 by the end of calendar year 1992.
- ◆ Strongly supported the formation of the Mid-Atlantic Regional Air Management Association (MARAMA) -- which encompasses the contiguous state air agencies from New Jersey to North Carolina. The Region attends all meetings striving to provide for consistent, cost-effective implementation of the Act.
- ◆ In FY92, settled eight civil judicial referrals resulting in over \$17,000,000 in civil penalties, and over \$32,000,000 in injunctive relief. These cases comprised the largest, third largest and ninth largest civil penalty cases in the history of the Clean Air Act.
- ◆ Obtained the largest penalties EPA had received for violations of the arsenic and benzene standards under the National Emission Standards for Hazardous Air Pollutant Regulations.

REGION IV -- ATLANTA, GEORGIA

Air, Pesticides and Toxics Management Division

- ◆ Served as major coordinator and active participant with EPA Headquarters, universities, and industry in the conduct of the Southern Oxidant Study including the conduct of an extensive field study conducted in the Atlanta area during the summer of 1992 for assessing the formation of tropospheric ozone. As a part of the summer study, Regional Office staff collected over 200 air samples in the Atlanta area during the summer of 1992 for accessing the formation of tropospheric ozone. As a part of the summer study, Regional Office staff collected over 200 air samples in the Atlanta nonattainment area and provided coordination assistance from July 20, through August 31, 1992. Information and data from the study will substantially aid in determining ozone formation and transport patterns facilitating the development of effective control strategies addressing key issues raised by the National Academy of Sciences report concerning the attainment of the ozone standards.
- ◆ Instituted a Section 112(r) implementation workgroup aimed at developing a best approach for implementing the "prevention of accidental releases" provision in the Region. Through participation in the workgroup, the Region has opened-up multiple lines of communication with governmental agencies such as OSHA, State Emergency Management Agencies, State Emergency Response Commissions, and Local Emergency Planning Committees that would not normally exist. This process has also facilitated intra-regional communication between Air staff, SARA Title III staff, and Title V permits program staff, as well as OSWER and OAQPS staff.
- ◆ Identified three major Department of Energy facilities as non-compliers with the NESHAP-radionuclide regulations and successfully negotiated federal facility compliance agreements that will bring these facilities into compliance by September 1993.
- ◆ Established extensive program in cooperation with the State of Florida for the monitoring of ambient air quality and emissions from the burning of massive levels of debris resulting from Hurricane Andrew.

REGION V -- CHICAGO, ILLINOIS

Air and Radiation Division

- ◆ Developed a Federal Implementation Plan to reduce ozone air pollution in the four-state Lake Michigan nonattainment area (June 29, 1990). This effort encouraged the states to enter into a voluntary association, the Lake Michigan Air Directors Consortium, to conduct a \$13 million study of the problem and to develop needed control strategies.
- ◆ Created a new and integrated multimedia approach to addressing the problem of air toxics deposition into the Great Lakes. The new framework has been endorsed by the Deputy Administrator and the Great Lakes Advisory Committee. The framework provides for the first time a mechanism for the ultimate control of this significant environmental problem. July 1992.

REGION VI -- DALLAS, TEXAS

Air, Pesticides and Toxics Division

- ◆ State funding in air pollution programs increased in Region 6 from \$16,935,128 in FY 89 to approximately \$26,250,806 in FY 92. This resulted in an overall increase of \$9.3 million or 55 percent.
- ◆ Region 6 has been successful in reviewing and acting upon State implementation plan (SIP) revisions to correct the State of Texas and Louisiana stationary source VOC regulations. The final notice for Texas rule corrections was published on September 13, 1992. The proposed approval notice for Louisiana was published September 30, 1992.
- ◆ Region 6 successfully worked with the State of Texas and Houston industries toward resolving whether the Houston area should be designated nonattainment for SO₂. The state and industries have agreed to perform a modeling analysis incorporating enforceable SO₂ limitations to demonstrate that the Houston area will not violate the NAAQS for SO₂. The Region will support not designating the area nonattainment if the demonstration is successful. This solution will result in an expected reduction in the Houston SO₂ emission inventory of greater than 100,000 tons/year.
- ◆ Since June 1990, Tulsa has implemented an "Ozone Alert" program in an effort to ensure ozone levels do not exceed the National Ambient Air Quality Standards. The program includes use of a computer model in association with the National Weather Service which helps predict conditions suitable for ozone exceedance; voluntary programs by local refineries to supply gasoline with a lower Reid Vapor Pressure; free bus rides on ozone alert days; voluntary improvement in employer trip reduction programs using free bus ride vouchers, parking subsidies for carpoolers, etc. Also, the Indian Nations Council of Governments (INCOG) has organized a pilot emissions trading program called MERIT to encourage action to reduce mobile and stationary source emissions.
- ◆ Region 6 States obtained enabling legislation for implementation of the Operating Permit Program during their legislative sessions in late 1991 and early 1992. Such legislation is the first step to approval of the State Operating Permit Programs.
- ◆ As a result of an aggressive outreach program, Region 6 has received the most applications nationwide to participate in the air toxics early reductions program; 28 sources from 17 facilities. The potential hazardous air pollutant emissions reductions from these applications total greater than 20,000,000 pounds per year.

REGION VII -- KANSAS CITY, KANSAS

Air and Toxics Division

- ◆ The number of exceedances of the National Ambient Air Quality Standards declined from 843 in 1975 to 11 in 1991 for the four states in Region VII. (The totals do reflect a change in the particulate standard from TSP to PM₁₀.)
- ◆ Region VII developed a strategy for attainment and maintenance of the ozone standard in Kansas City. This strategy evolved through a consensus-building effort in the local community and resulted in EPA approval of the area's maintenance plan and redesignation to attainment in 1992.
- ◆ As part of the agency's multimedia lead initiative, Region VII filed a complaint and lodged a consent decree on June 28, 1991, against Gates Energy Products, Warrensburg, Missouri. The consent decree contained commitments to reduce lead-oxide waste, cut back 1,1,1-trichloroethane emissions, conduct multimedia management and compliance audits in Regions IV and VII, and pay \$200,999 in civil penalties.
- ◆ On May 20, 1992 Region VII participated in the national administrative cluster by filing five administrative complaints which were 10 percent of the total filed complaints.
- ◆ Subsequent to passage of the Clean Air Act Amendments, Region VII established a legislative team in 1991 to review the states' enabling legislation. Both Missouri and Nebraska passed the necessary legislation in 1992; Iowa and Kansas introduced acceptable legislation but the bills were not given final approval.
- ◆ Missouri developed and submitted the Doe Run Herculaneum lead state implementation plan (SIP) in response to the Region's SIP call. EPA gave final limited approval to the SIP revision in 1992.

REGION VIII -- DENVER, COLORADO

Air, Radiation and Toxics Division

- ◆ Completed a major State Implementation Plan (SIP) for Salt Lake and Utah Counties that is designed to achieve healthful ambient air levels for small particles (PM₁₀). A unique EPA/State cooperative agreement was instrumental in beating court ordered deadlines. The SIP calls for investments of over \$300 million for air quality control hardware.
- ◆ Participated with new Denver International Airport in "Pollution Prevention by Design" project to assure minimum air quality impact of the new \$3 billion airport through: use of natural gas vehicles, stage II gasoline vapor recovery, energy efficiency terminal design and lighting, low NO_x boilers, and evaluation of existing rail lines for mass transit.
- ◆ Solved visibility and health-related air quality problems in Crested Butte, Colorado through a unique industry/government cooperative program that changed over 90 percent of high polluting older stoves to EPA-approved, low-emission stoves.
- ◆ Continued and improved the first oxygenated fuels program in the nation in Denver, Colorado. Minimum oxygen content was raised from 1.5 percent to 2.5 percent. State evaluations show a 15 percent cut in carbon monoxide emissions.
- ◆ Denver carbon monoxide (CO) levels improved dramatically. From 1989 to 1991, measured high levels were cut by 39 percent and the number of days when the standard was violated.
- ◆ Cited two power plants owned by the Public Service Company of Colorado with violations of the New Source Performance Standards. In the resulting consent decree, the Company agreed to pay \$740,000 in penalties and to replace outdated control equipment.

REGION IX -- SAN FRANCISCO, CALIFORNIA

Air and Toxics Division

- ◆ Completed the final outer continental shelf rule, which was signed on September 4, 1992. The region is beginning the implementation phase of the program.
- ◆ Provided an extraordinary amount of support to the South Coast Air Quality Management District, to help develop RECLAIM. Participated in work groups and conference calls, attended numerous meetings and attempted to guide South Coast so that the RECLAIM regulations that are adopted are federally approvable.
- ◆ Began enforcement initiative that resulted in lawsuits against Apache Nitrogen and Arizona Power Co-op, which are two violators of applicable NSPS.
- ◆ On July 1, 1992, the Ninth Circuit court of Appeals ordered EPA to promulgate an ozone/carbon monoxide FIP for the South Coast area. Tied by settlement agreement are ozone FIPs for Ventura and Sacramento. The Ninth Circuit denied a request for reconsideration but granted a motion to stay the mandate until an appeal is filed with the US Supreme Court and final disposition is made.
- ◆ Brought together air quality representatives from seven states and four Federal agencies to set up the Grand Canyon Visibility Transport commission as required under Section 169B of the CAA. The Commission held its first meeting on November 13, 1991.

REGION X -- SEATTLE, WASHINGTON

Air and Toxics Division

- ◆ Region 10 issued the first three administrative complaints in the nation, and by year-end had issued 17 administrative complaints. We also negotiated the first settlement in the country that contained the progressive Supplemental Environmental Project (SEP) provision.
- ◆ State Implementation Plans efforts resulted in the submittal of 16 PM-10 SIPs by the CAAA deadline (out of a total of 18 due) and its expeditious processing of those submittals resulted in the first three SIPs forwarded by any Region to headquarters for final approval. Subsequently, a fourth SIP has been forwarded for headquarters review.
- ◆ Lower ambient impacts (sometimes dramatically lower) being recorded in most of the Region's PM-10 nonattainment areas as compared to those measured in the 1980s. Many of the control measures reflected in the SIP submittals have already been implemented, resulting in substantial air quality improvements, and in some instances, measured attainment of the National Ambient Air Quality Standards.
- ◆ The carbon monoxide/ozone SIP program projects a certain and full implementation of oxygenated fuels programs in three of our states in the coming winter and the submittal of most CO/03 SIPs (13 are due) by the CAAA deadline.

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APPENDIX III

SCHEDULE FOR IMPLEMENTATION OF THE CLEAN AIR ACT AMENDMENTS OF 1990

At the request of EPA Administrator William K. Reilly, the Office of Air and Radiation published a strategy for implementing the Clean Air Act Amendments of 1990, shortly after the law was enacted. An updated version was published in July 1992. The strategy document contains a chart showing OAR's schedule for carrying out the law through December 1993, as well as those actions already completed.

The chart is reprinted below with changes to bring it up to date. For each entry, the chart shows the following information:

- ◆ whether or not the action has been completed, and if so, when
- ◆ the Agency's current target date for completion of planned actions
- ◆ the statutory deadline for the action, if one exists

EPA has proposed or finalized 76 rules and has taken many other actions to carry out the 1990 Amendments, as the chart indicates. However, the Agency has missed a number of the deadlines in the 1990 Amendments. (For a discussion, see Chapter 1.) The information provided in the chart shows which statutory deadlines have been missed.

The chart contains most but not all significant actions needed to carry out the 1990 amendments through December 1993. The chart does not include, for example, some of the requirements implemented by EPA offices other than the Office of Air and Radiation, such as the Office of Research and Development. Target dates for future actions are subject to change based on new risk assessments, court decisions, changes in available resources and other factors.

Statogy Target Date	Title	Activity	Completed	Statutory Deadline
Dec-90	Title I - Nonattainment	Issue "Getting Started" letter to Governors	Y	
		States submit request/justification for 5% classification adjustments	Y	Dec-90
Jan-91	Title I - Nonattainment	Publish two-year implementation strategy	Y	
		Publish notice of initial PM-10 moderate nonattainment areas	Y	
		Initiate additional PM-10, SO2, lead designation process	Y	
	Title VI - CFC's	Listing of depleting substances	Y	Jan-91
Feb-91	Title I - Nonattainment	Act on 5% classification adjustment requests	Y	Feb-91
Mar-91	Title I - Nonattainment	States submit nonattainment area designations	Y	Mar-91
	Title III - Air Toxics	Propose early reductions rulemaking	Y	
	Title VI - CFCs	Direct final 1991 production limits	Y	
Apr-91	Title I - Nonattainment	States submit PM-10 areas unable to attain by 1994	Y	
		States respond to list of PM-10, SO2, Lead nonattainment areas	Y	
	Title V - Permits	Propose State permit regulations	Y	
May-91	Title I - Nonattainment	States deadline for RACT corrections	Partial	May-91
		Notify States of intent to modify suggested boundaries	Y	May-91
	Title II - Mobile Sources	Finalize gasoline Reid Vapor Pressure regulations	Y	May-91
		Finalize Tier I car and truck standards	Y	May-91
		Propose reformulated gasoline requirements	Y	
		Propose clean fuels fleet and CA pilot credit programs	Y	
		Propose urban bus regulations	Y	
		Propose emission control diagnostics rule	Y	
	Title IV - Acid Rain	Propose regulations for auctions and sales	Y	
Jun-91	Title I - Nonattainment	Propose PM-10 area reclassifications	Y	Jun-91
	Title III - Air Toxics	Publish draft list of source categories	Y	
		Propose list of high risk pollutants, 90/95% early reductions guidance	Y	
Jul-91	Title I - Nonattainment	Finalize ozone, CO, PM-10, and lead nonattainment boundaries	Y	Jul-91
	Title II - Mobile Sources	Propose lead substitute gasoline additives	Y	
	Title VII - Enforcement	Propose administrative penalties rules of practice	Y	
Sept-91	Title VI - CFC's	Propose CFC phase-out regulations	Y	
		Propose mobile air conditioning recycling regulations	Y	
Oct-91	Title I - Nonattainment	Publish VOC and CO emission inventory guidance	Y	
	Title II - Mobile Sources	Publish study on non-road engines	Y	Nov-91
Nov-91	Title I - Nonattainment	Publish guidance on control cost-effectiveness	Y	Nov-91
		States submit PM-10 SIPs	Partial	Nov-91
		Publish air quality and emissions trends report	Y	
		Establish Grand Canyon visibility transport commission	Y	Nov-91
	Title III - Air Toxics	Propose MACT for dry cleaners (per court order)	Y	
Dec-91	Title I - Nonattainment	Propose outer continental shelf rule	Y	
	Title IV - Acid Rain	Finalize regulations for auctions and sales	Y	Nov-91
		Propose allowance trading system	Y	
		Propose acid rain permit program	Y	
		Propose continuous emission monitor requirements	Y	
		Propose excess emissions rules	Y	
		Propose conservation and renewable incentives	Y	

Strategy Target Date	Title	Activity	Completed	Statutory Deadline
Jan-92	Title V - Permits	Publish guidance on State programs to assist small businesses	Y	
	Title VI - CFCs	Propose ban on non-essentials products	Y	
Feb-92	Title II - Mobile Sources	Finalize urban bus regulations (1991 & 1992)	Y	
	Title VII - Enforcement	Finalize administrative penalties rules of practice	Y	
Mar-92	Title I - Nonattainment	Publish Title I General Preamble	Y	
	Title II - Mobile Sources	Finalize onboard controls regulatory decision	Y	Nov-91
Apr-92	Title I - Nonattainment	Propose rules for ozone, NOx, and VOC monitoring	Y	
	Title II - Mobile Sources	Proposed rule on reformulated gasoline SNPRM (supplemental notice of proposed rulemaking)	Y	Nov-91
May-92	Title I - Nonattainment	Publish guidance on TCM's (transportation control measures)	Y	Nov-91
		Convene NE ozone transport commission	Y	May-92
	Title II - Mobile Sources	Finalize cold temperature CO standards	Y	Nov-91
	Title VI - CFC's	Propose CFC labeling regulations	Y	
Jun-92	Title V - Permits	Finalize State permit regulations	Y	Nov-91
	Title VI - CFC's	Finalize mobile air conditioning recycling regulations	Y	Nov-91
Jul-92	Title I - Nonattainment	Revise two-year implementation strategy	Y	
		Propose discretionary sanction rules	Y	
		States submit SIPs for initial SO2 nonattainment areas	Partial	May-92
	Title II - Mobile Sources	Propose enhanced I/M regulation	Y	
	Title III - Air Toxics	Publish final list of source categories	Y	Nov-91
	Title IV - Acid Rain	Propose list of Phase II utility allowances	Y	Dec-91
Aug-92	Title I - Nonattainment	Finalize CFC phase-out regulation	Y	Sept-91
		Finalize outer continental shelf rules	Y	Nov-91
		Finalize guidance on transportation air quality planning	Y	Aug-91
Sept-92	Title I - Nonattainment	Propose additional PM-10 nonattainment areas	Y	
	Title III - Air Toxics	Propose regulatory schedule for all source categories	Y	
Oct-92	Title I - Nonattainment	Finalize PM-10 BACM technical guidance	Y	May-92
		Publish 1991 air quality data and emission trends report	Y	
		Publish Title I NOx guidance	Y	
	Title II - Mobile Sources	Finalize oxygenated fuel credit guideline	Y	Aug-91
	Title III - Air Toxics	Finalize early reductions rulemaking	Y	
		Propose MACT for hazardous organic chemical manufacturing	Y	
	Title IV - Acid Rain	Propose NOx requirements for utility boilers	Y	
		Finalize excess emission requirements	Y	May-92
		Finalize allowance trading system	Y	May-92
		Finalize continuous emission monitoring requirements	Y	May-92
		Finalize conservation and renewable incentives	Y	May-92
Nov-92	Title I - Nonattainment	Finalize acid rain permit program	Y	May-92
		Finalize PM-10 area reclassifications		Dec-91
		States submit RACT catch-up rules, NSR rules, CO attainment demonstration and contingency measures	Partial	Nov-92
		States submit small business assistance programs	Partial	Nov-92
	Title II - Mobile Sources	States submit base ozone, CO emission inventories	Partial	Nov-92
		Finalize enhanced I/M regulation	Y	Nov-91

Strategy Target Date	Title	Activity	Completed	Statutory Deadline
Nov-92 (cont'd)	Title III – Air Toxics	Propose rules for risk management plans and prevention programs		
		Propose list of substances for accidental releases prevention program		
		Propose MACT for coke ovens		
	Title VI – CFC's	Propose emission reduction program		
Dec-92	Title VII – Enforcement	Propose rules for citizen suits		
	Title I – Nonattainment	Publish alternative control technology document for VOCs from bakeries		Nov-93
	Title II – Mobile Sources	Propose revisions to motor vehicle certification procedures (I/M short test)		
	Title VI – CFC's	Finalize ban nonessential products		Nov-91
		Propose safe alternatives		
Jan-93	Title VII – Enforcement	Propose monetary awards rules		
	Title I – Nonattainment	Propose economic incentive rules		
		Approve/disapprove first PM-10 SIPs		Jan-93
	Title II – Mobile Sources	Finalize emission control diagnostic rule		May-92
		Publish draft mobile source air toxics study		
		Propose clean fuel fleet vehicle standards, conversions and general provisions		Nov-92
		Finalize California pilot credit program		Nov-91
		Finalize clean fuels fleet (TCM's)		Nov-91
		Submit transportation systems report to Congress		Jan-93
	Title III – Air Toxics	Complete study of the hazards of hydrofluoric acid		Nov-92
		Propose general provisions for MACT standards (40 CFR Part 63)		
		Propose MACT for chromium electroplating		
	Title VI – CFC's	Propose procurement regulations		
	Title VII – Enforcement	Propose rules for contractor listing		
Feb-93	Title I – Nonattainment	Propose tank vessel rule		
		Issue transportation planning guidance (EPA/DOT)		
		Propose transportation conformity criteria		
		Publish alternative control technology document for VOCs from pesticide applications		Nov-93
		Propose general conformity criteria		
	Title II – Mobile Sources	Finalize urban bus retrofit		Nov-91
		Finalize urban bus 94+ (PM standard)		Jan-92
	Title IV – Acid Rain	Sources submit Phase I permit applications and proposed compliance plans		Feb-93
		Propose OPT-IN regulations — combustion sources		
		Finalize list of Phase II utility allowances		Dec-92
Mar-93	Title VI – CFC's	Propose accelerated CFC phase-out		
	Title VII – Enforcement	Propose rules for field citation program		
		Propose rules for enhanced monitoring and compliance certification		
	Title II – Mobile Sources	Propose reformulated gasoline complex model		
		Propose non-road emission standards > 50 hpr.		Nov-92
	Title III – Air Toxics	Propose guidance for modification provisions		
		Issue HAP list petition procedure guidance		
	Title IV – Acid Rain	Initiate auctions and sales of allowances		Mar-93
	Title VI – CFC's	Finalize CFC labeling regulations		May-92

Strategy Target Date	Title	Activity	Completed	Statutory Deadline
Apr-93	Title I - Nonattainment	Finalize additional PM-10 nonattainment areas		
		States submit lead SIPs (18 months from designation)		Jul-93
		Promulgate sanctions for States failing to submit RACT fix-up rules (18 months from findings)		Apr-93
		Finalize rules for ozone, NOx, VOC enhanced monitoring		May-92
	Title II - Mobile Sources	Publish final mobile source related air toxics study		May-92
		Finalize lead substitute gasoline additives		Nov-91
	Title III - Air Toxics	Propose guidance for State air toxics program		
May-93	Title VI - CFC's	Finalize emission reduction program		Jan-92
	Title VIII - Miscellaneous	Section 811 Report (International Competitiveness)		May-92
	Title I - Nonattainment	PM-10 PSD increments (11/92 court agreement)		
		Propose revisions to NSR program		
	Title II - Mobile Sources	Finalize procedures of enforcement for urban bus stds.		May-92
		Finalize revisions to motor vehicle certification procedures (I/M short test)		Nov-91
		Complete testing protocols for fuels and additives		
Jun-93	Title III - Air Toxics	Propose MACT for commercial sterilizers		
	Title VIII - Miscellaneous	Issue report on the impact of the 1990 CAA Amendments on visibility in Class I areas		Nov-92
	Title II - Mobile Sources	Propose non-road emission standards < 50 hpr.		Nov-92
		Propose non-road emission standards for marine engines		Nov-92
	Title III - Air Toxics	Propose Stage I gasoline marketing MACT		
		Publish study of hydrogen sulfide emissions from extracting natural gas and oil		Nov-92
Jul-93	Title VII - Enforcement	Finalize rules for citizen suits		
		Finalize rules for monetary awards		
	Title I - Nonattainment	Finalize discretionary sanctions rules		
		Publish 185B NOx/VOC study		Feb-92
	Title II - Mobile Sources	Finalize clean fuel fleet vehicle standards, conversions, and general provisions		Nov-92
	Title III - Air Toxics	Finalize MACT for dry cleaners		Nov-92
Aug-93		Finalize general provisions for MACT standards		
	Title I - Nonattainment	Finalize transportation conformity criteria		Nov-91
	Title II - Mobile Sources	Finalize vehicle evaporative emissions regulations		Aug-93
	Title III - Air Toxics	Finalize MACT for coke ovens		Dec-92
		Finalize list of substances for accidental releases prevention program		Nov-92
	Title IV - Acid Rain	EPA action on Phase I permits		Aug-93
Sept-93	Title I - Nonattainment	Finalize general conformity criteria		Nov-91
	Title II - Mobile Sources	Finalize reformulated gasoline regulations		Nov-91
		Finalize reformulated gasoline complex model		
	Title III - Air Toxics	Finalize regulatory schedule for all source categories		Nov-92
		Propose medical waste incinerator rule		
Oct-93	Title I - Nonattainment	Finalize economic incentives rules		Nov-92
		Promulgate FIP's for States failing to submit RACT fix-up rules (2 years from findings)		
		Publish air quality and emission trends report		

Strategy Target Date	Title	Activity	Completed	Statutory Deadline
Oct-93 (cont'd)	Title III - Air Toxics	Finalize MACT for hazardous organic chemical manufacturing		Nov-92
		Propose MACT for pulp and paper		
		Finalize standards for large MWC's		Nov-91
		Finalize standards for small MWC's		Nov-92
		Propose MACT for polymers and resins II		
	Title IV - Acid Rain	Finalize NOx requirements for utility boilers		May-92
		Begin issuing allowances to small diesel refineries		Oct-93
		Propose OPT-IN regulations -- process sources		
	Title VI - CFC's	Finalize procurement regulation		May-92
Nov-93	Title I - Nonattainment	Publish SOCM I distillation processes CTG		Nov-93
		Publish SOCM I reactor processes CTG		Nov-93
		States receive emission source statements		Nov-93
		Submit consumer/commercial products study report to Congress		Nov-93
		Publish alternative control technology documents for NOx sources		Nov-93
		Publish results of ozone design value study		Nov-93
		States submit selected SIP provisions for moderate and above ozone areas		
		Publish auto body refinishing CTG		Nov-93
		Publish batch processes CTG		Nov-93
		Publish petroleum/industrial wastewater CTG		Nov-93
		Publish plastic parts coating CTG		Nov-93
		Publish storage tanks CTG		Nov-93
		Publish Web offset lithography CTG		Nov-93
		Publish SOCM I batch processes CTG		Nov-93
		Publish surface coal mining study		Nov-93
	Title III - Air Toxics	Submit Great Lakes study report to Congress		Nov-93
		Issue urban area strategy - research report		Nov-93
		Submit NAS study to Congress		May-93
		Finalize rules for risk management plans and prevention programs		Nov-93
		Publish guidance for state air toxics programs		Nov-91
	Title IV - Acid Rain	States submit acid rain permit program proposals		Nov-93
		Promulgate SO2 new source performance standards (NSPS) for new fossil fuel utility units		Nov-93
	Title V - Permits	States submit operating permit programs		Nov-93
	Title VI - CFC's	Finalize safe alternatives program		Nov-92
		Finalize accelerated CFC phase-out		
	Title VIII - Miscellaneous	Interim source/receptor report on visibility		
Dec-93	Title VII - Enforcement	Finalize rules for contractor listing		
		Finalize guidance/rules for field citation program		

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