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Paper Tigers and Killer Air

How Weak Enforcement Leaves Communities Vulnerable to Smog

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Executive Summary

More than 158 million Americans live in areas that fail to meet the federal standard for ground-level ozone pollution, which can cause lung damage and poses a particular risk to children. In these areas, "code red" or "code orange" air quality advisories are as familiar a part of the summer forecast as high heat and humidity levels.

Census data reveal that well over half the population in 10 of the nation's 11 most populous states lives in areas with ozone levels that exceed the standard set by the Environmental Protection Agency. In five of these states, more than 75 percent of the population lives in counties that fail to attain the EPA's standard, and in one state, New Jersey, every single resident suffers under excessive ozone levels. (See Figure 1, page 2)

States are primarily responsible for enforcing the federal ozone standard (as well as other air quality standards). But resources are inadequate to the task, due in large part to declining federal grants to state and local air quality agencies. This report documents the paltry number of inspectors available to inspect permitted air pollution facilities. In Texas, for example, the ratio is one inspector for every 352 permitted facilities. (For ratios in other states, see chart on page 9.)

In 1998, internal EPA audits showed that significant violations of the Clean Air Act by industrial facilities were going unreported and uncorrected because chronically under-funded states were not performing required inspections. Yet instead of committing additional resources to solve this problem, the EPA decided in 2001 to greatly relax standards for state inspections of facilities emitting ozone pollution. Under these extraordinarily weak rules, state inspectors must visit a factory spewing tens of thousands of tons of harmful air pollutants only once every five years.

This inaction may have made it easier for states to meet inspection requirements, but it also made it more difficult to improve air quality and achieve compliance with the ozone standard. Imagine, for example, the consequences of removing street patrols from the nation's major cities for four out of five days. There undoubtedly would be a dramatic spike in crime. Likewise, in the absence of an effective compliance presence in the field (that is, inspectors who actually visit plants on a regular basis), industrial facilities are more likely to cut corners, avoid expenses, violate permit terms, and thus emit more air pollution than they are allowed.

Cumulatively, the large factories that are left uninspected foul the air with millions of tons of air pollutants each year. In 1999 (the most recent year for which such data are available), the five largest stationary sources of ozone pollution in each of the 10 states analyzed in this report emitted a total of 173,193 tons of volatile organic compounds, or VOCs, which combine with nitrogen oxides (NOx) to form ozone pollution, the principal cause of smog.

Pollution from these facilities is a major cause of "code orange" and "code red" days. Groups particularly vulnerable on these days include children, active adults, and those with asthma and chronic lung diseases such as bronchitis and emphysema. Children with asthma—of which there are an estimated nine million in the United States—are considered at greatest risk. On "code orange" days, these vulnerable groups are warned to limit outdoor activity, while on "code red" days (the next step up on the EPA's Air Quality Index, when everyone is warned to limit outdoor exertion), they are cautioned to avoid "prolonged" outdoor activity altogether.

Data collected by the EPA and presented in this report show that metropolitan areas in each of the 10 states analyzed in this report continue to experience numerous "code orange" and higher days. From 2001 through 2005, Riverside-San Bernardino, CA, for example, had 454 days "code orange" or higher; Houston had 126 days; Cleveland had 65 days; New York City had 55 days; and Chicago had 51 days. (For state data on the number of code orange days or higher, see chart on page 14.)

In 1970, nearly four decades ago, Congress made eliminating dangerous levels of ozone in the air a national priority, requiring states to bring areas within their boundaries into attainment by 1977. Yet as areas continued to fall short of the ozone standard, Congress continued to push back the deadline, first to 1982, then to 1987, and then to 2005 for "severe" areas and 2010 for "extreme" areas. If the EPA intends the latest extension of the attainment deadline to be the last, it must get serious about enforcement, starting by putting environmental cops back on the beat. As the EPA's own inspector general observed in 1998, inspections of industrial facilities "are the front line of an enforcement program upon which all other aspects of the program are built."

Figure 1—Population in Profiled States Living in Areas that Exceed Ozone Standards

State	Total Population[1]	Number of People Living in Counties Failing to Meet Ozone Standard	Percent of State Population in Counties Failing to Meet Ozone Standard	Sensitive Groups Living in Counties Failing to Meet Ozone Standard				
				Children 9 and under	Persons 75 and older	People suffering from asthma[2]	People suffering from chronic bronchitis	People suffering from emphysema
California	33,871,648	31,734,667	93.7	4,922,149	1,578,182	2,659,266	1,014,043	380,510
Georgia	8,186,453	4,493,924	54.9	681,834	154,495	331,735	125,805	42,358
Illinois	12,419,293	8,748,109	70.4	1,331,787	455,010	728,576	262,114	99,549
Michigan	9,938,444	7,739,429	78	1,131,505	428,106	606,361	227,204	89,346
New Jersey	8,414,350	8,414,350	100	1,168,314	538,467	653,003	242,883	99,021
New York	18,976,457	16,172,094	85.2	2,237,160	976,853	1,381,574	502,777	201,431
North Carolina	8,049,313	4,870,121	61	683,909	235,961	391,017	154,437	57,977
Ohio	11,353,140	8,858,139	78	1,227,501	558,920	732,178	277,204	113,427
Pennsylvania	12,281,054	10,767,725	88	1,375,862	825,458	688,678	335,910	144,284
Texas	20,851,820	11,645,464	55.9	1,870,302	423,566	900,744	345,430	119,994
Total	144,341,972	113,444,022	78.6	16,630,323	6,175,018	9,073,132	3,487,807	1,347,897

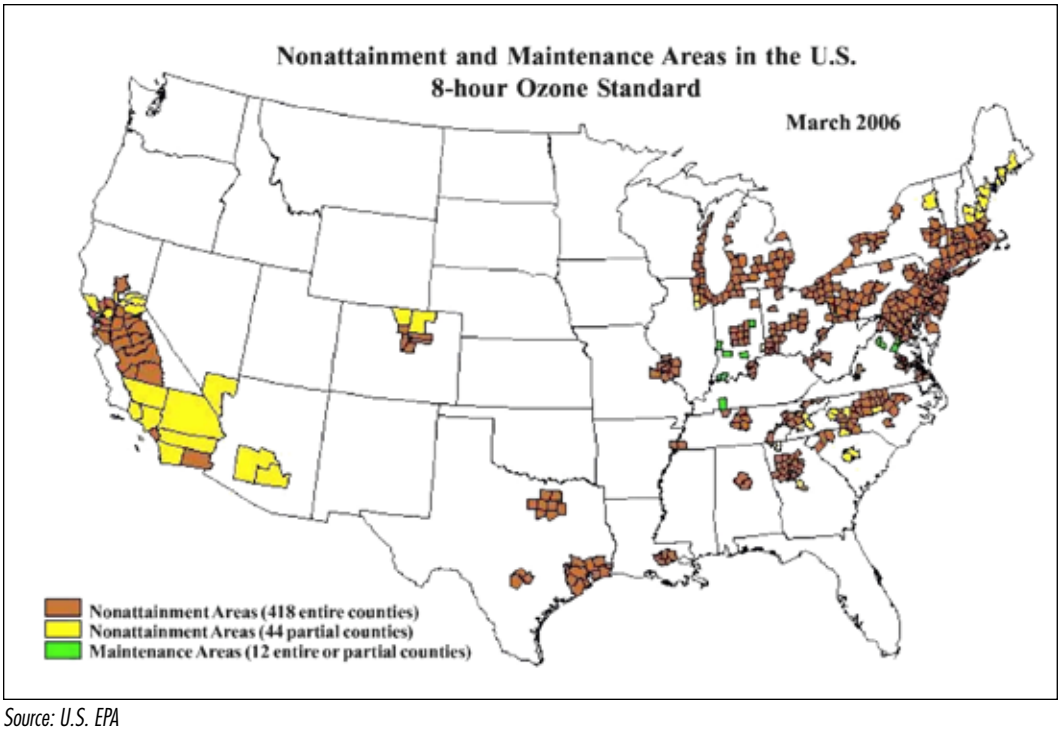
Tens of Millions of People Are Still Exposed to Unsafe Levels of Ozone

Population Exposed

Nearly four decades after efforts to control ozone began, more than 158 million people across the country live in areas where ozone pollution levels still exceed the EPA's air quality standard for ozone.[3] As shown in Figure 1, in the 10 states profiled in this report—California, Georgia, Illinois, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania and Texas[4]—*more than 113 million people* live in counties where ozone levels fail to meet the EPA's standard and thus continue to be exposed to unsafe levels of ground-level ozone.

This number includes 16.6 million children under the age of 10 and 6.2 million persons 75 and older. Moreover, the American Lung Association estimates that these counties are home to nine million people who suffer from asthma, 3.5 million people who suffer from chronic bronchitis, and 1.3 million people who suffer from emphysema—all groups identified by the EPA as being particularly sensitive to the adverse health effects of ozone exposure.[5]

Figure 2—Nationwide Distribution of Counties Failing to Meet the EPA's Ozone Standard



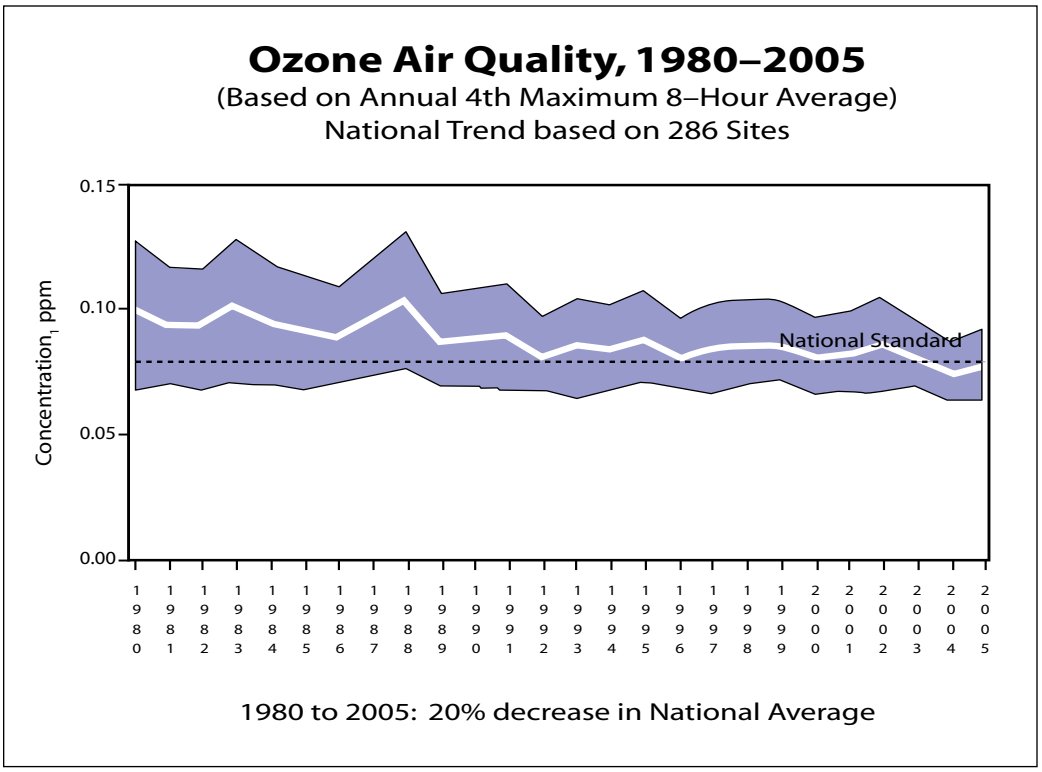
Source: U.S. EPA

Slow Progress

By any measure, the Clean Air Act's accomplishments are significant. As the EPA reports, between 1970 and 2005, total emissions of the six "criteria air pollutants" (ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead) decreased by 53 percent even while, in the same period, "gross domestic product increased 195 percent, vehicle miles traveled increased 178 percent, energy consumption increased 48 percent, and U.S. population grew by 42 percent."[6]

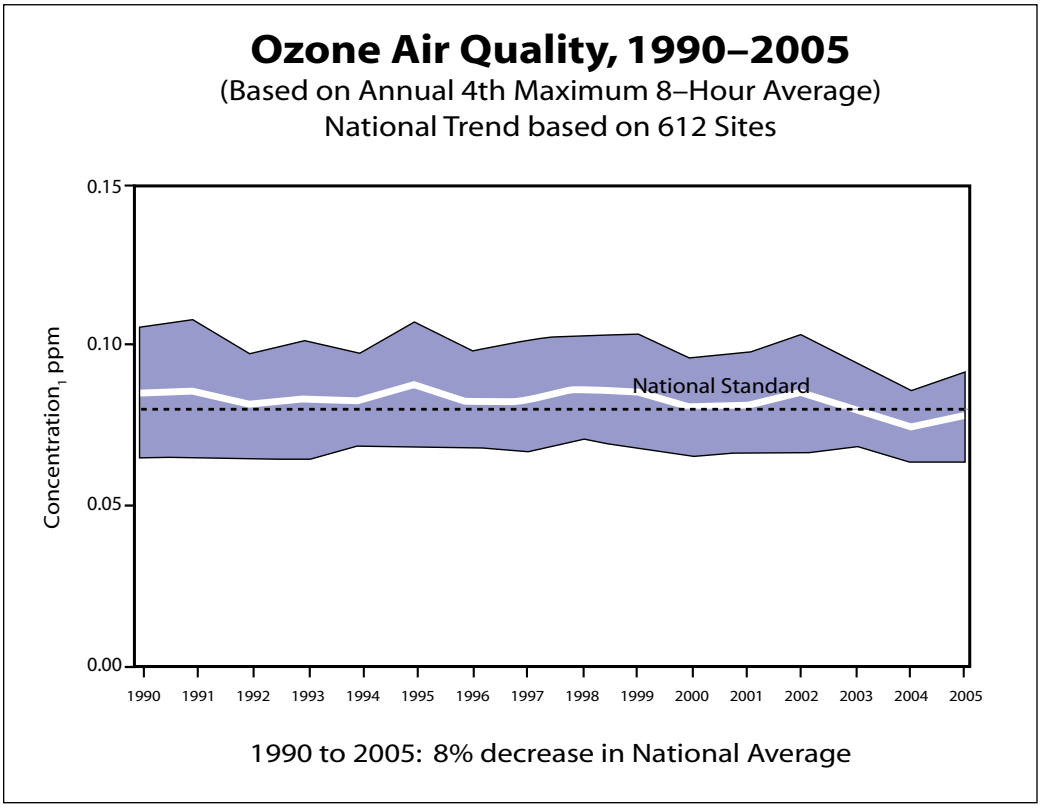
Reductions in levels of ground-level ozone pollution, however, have not been as impressive. As depicted in Figures 3 and 4, measured against the EPA's most recent (8-hour) standard for ozone (discussed in more depth later in this report), 2004 ozone levels were only 8 percent lower than 1990 levels and 20 percent lower than 1980 levels, with the rate of decrease slowing during the 1990s.[7]

Figure 3—National 8-hour Ozone Air Quality Trend, 1980-2005[8]



Source: U.S. EPA

Figure 4—National 8-hour Ozone Air Quality Trend, 1990-2005[9]



Source: U.S. EPA

Although the EPA reported that the 2003 ozone season had exhibited the lowest observed ozone levels since 1980, it noted that favorable weather conditions assisted in the lower ozone concentrations.[10] The American Lung Association also suggested that 2003 and 2004 reductions may have been mainly due to cooler summers and more rain than usual in some areas.[11] As demonstrated by the 2005 increase in ozone concentrations, shown in Figures 3 and 4, cooler summers, though fortuitous for the short term, simply cannot be relied upon as a long-term solution to the problem of unsafe ozone levels.

Federal, state, and local governments have been working to reduce ground-level ozone since 1970, when Congress amended the Clean Air Act to require that air pollution be reduced to safe levels throughout the country. Nearly 40 years later, although multiple deadlines have come and gone, dangerous levels of ground-level ozone pollution in this country remain. In the late 1980s, the General Accounting Office, or GAO (now the Government Accountability Office), analyzed the EPA's progress in controlling ozone pollution and concluded, "EPA and states have clearly not achieved the ozone reduction goals envisioned in the Clean Air Act."[12] At that time, "about 77 million Americans live[d] in areas where ozone levels exceeded the standard."[13] As noted above, that number now stands at 158 million people.

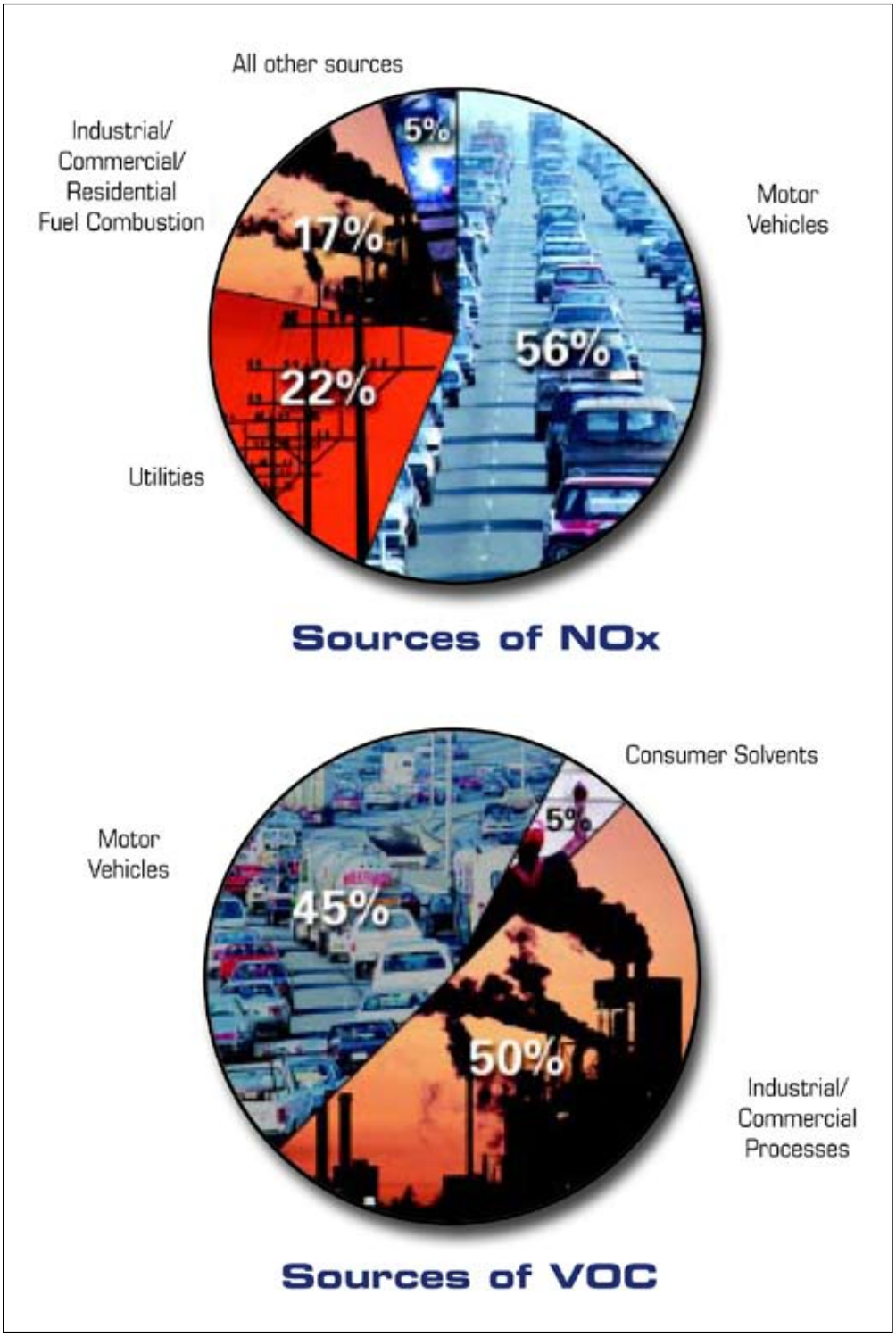
Stationary Sources: A Significant Contributor to Ozone Pollution

Ozone is created at ground level by a chemical reaction between oxides of nitrogen (NOx) and VOCs in the presence of heat and sunlight, in a reaction that can be simplified as the equation shown in Figure 5.[14] NOx and VOCs are therefore commonly referred to as "ozone precursors." Ozone has the same chemical structure whether it occurs miles above the earth or at ground level.[15] However, whereas ozone that occurs naturally in the stratosphere (approximately 10 to 30 miles above the earth's surface) forms a layer that protects human health and the environment from the sun's harmful rays, where it occurs in the earth's lower atmosphere it has devastating consequences for public health (as explained more fully below).[16]

Figure 5—Formation of Ground-Level Ozone

Since ozone is not emitted directly into the air but rather is formed through a reaction of the two precursor pollutants, it is sometimes referred to as a "secondary air pollutant."[17] Accordingly, the sources of the precursor pollutants (NOx and VOCs) ultimately are the sources of ozone pollution. As shown in Figure 6, NOx emissions come primarily from motor vehicles and utilities (power plants), while VOCs are emitted mainly by motor vehicles and industrial/commercial processes, including large sources such as chemical manufacturing plants, and smaller sources such as auto-body refinishing shops.[18] Figure 7 shows the top five emitters of VOCs per year—and the tons per year of VOCs they emitted as of 1999—in California, Georgia, Illinois, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania and Texas.[19] The sheer volumes emitted by these stationary sources of air pollution make clear the need to ensure that they are complying with the terms of their operating permits by conducting on-site compliance inspections, as further discussed on page 7.

Figure 6—Sources of NOx and VOCs[20]



Source: U.S. EPA

Figure 7—Top 5 Major Sources of VOCs in Profiled States, 1999

	Rank	Facility	County	VOC Emissions (tons per year)
California	1	Chevron Products Company	Contra Costa	1,521
	2	Tosco Corp., Avon Refinery	Contra Costa	1,260
	3	Nutrasweet Kelco Co.	San Diego	1,205
	4	Shell Martinez Refining Company	Contra Costa	1,064
	5	New United Motor Manufacturing	Alameda	815
Georgia	1	Union Camp Corp.	Chatham	2,443
	2	Ford Motor-Atlanta Assembly Plant	Fulton	1,428
	3	Gilman Paper Co. St. Mary's Kraft Bag	Camden	1,405
	4	Great Southern Paper Woodlands Oper.	Early	1,165
	5	Brunswick Pulp & Paper Co.	Glynn	1,137
Illinois	1	Acme Steel Company	Cook	9,272
	2	Amoco Petroleum Products- Wood River Terminal	Madison	6,490
	3	Shell Oil Co. Wood River Mfg. Complex	Madison	4,231
	4	Chrysler Corp. - Belvidere Assembly Plant	Boone	4,194
	5	World Color Press - Salem Gravure Div.	Marion	4,171
Michigan	1	Holnam Inc. Dundee Cement	Monroe	6,225
	2	Rouge Steel Co.	Wayne	3,131
	3	T&D Heat Treating Co., Inc.	Wexford	2,625
	4	General Motors Corp.	Oakland	1,738
	5	GMC West Saginaw Street Complex	Ingham	1,541
New Jersey	1	Gomar Mfg. Co., Inc.	Union	9,155
	2	Dupont De Nemours, E.I., & Co.	Salem	6,583
	3	Air Products and Chemical, Inc.	Gloucester	6,552
	4	Monsanto Chemical Co.	Hudson	3,478
	5	Imitt-Bayonne	Hudson	3,477
New York	1	Lockheed Martin, Ocean, Radar & Sensor	Onondaga	11,382
	2	Kodak Park Division	Monroe	3,898
	3	General Electric Silicone Products	Saratoga	2,478
	4	Holtsville Terminal - Tosco Pipeline Co.	Suffolk	1,617
	5	International Imaging	Erie	1,297
North Carolina	1	Weyerhauser Company	Martin	2,542
	2	Norandal USA, Inc.	Rowan	1,572
	3	Cargill, Incorporated	Wake	1,136
	4	Philip Morris USA	Cabarrus	1,025
	5	Broyhill Miller Hill Complex	Caldwell	1,019
Ohio	1	BP Oil Company	Lucas	5,629
	2	Honda Marysville Auto Plant	Union	3,694
	3	BP Chemicals Inc.	Allen	2,769
	4	Avery Dennison	Lake	2,335
	5	Chrysler Corp./Toledo Assembly I	Lucas	2,052
Pennsylvania	1	PH Glatfelter Co.	York	1,992
	2	3M Co.	Bucks	1,617
	3	Bethlehem Structural Prod. Corp.	Northampton	1,496
	4	Alum Co. Amer.	Lebanon	1,297
	5	Witco Chem. Corp.	Delaware	1,238
Texas	1	Western Gas Resources	Pecos	10,459
	2	Clark Refining & Marketing, Inc.	Jefferson	7,649
	3	Phillips 66 Company	Hutchinson	6,155
	4	Shell Oil Company	Harris	5,514
	5	Mobil Oil Corporation	Jefferson	5,025
Total				**173,193**

Little Oversight of Industrial Facilities

Insufficient State Inspectors

Under the 1990 Amendments to the Clean Air Act, "major" sources of air pollution (stationary sources that emit more than a specified number of tons per year of certain air pollutants) obtain a federally-enforceable operating permit.[21] Most of these "Title V" permits—so named for the section of the Clean Air Act that establishes the program—are issued by state and local permitting authorities.[22] Each Title V permit must include self-monitoring, compliance, certification, and reporting requirements "to assure compliance with the permit terms and conditions."[23]

State and local inspections serve to verify the accuracy of self-monitoring and reporting, and detect and document violations to support enforcement actions.[24] Only through on-site inspections can the permitting agency get an accurate picture of what is going on at a facility, a point that was revealed with stark clarity by a series of audits performed by the EPA's inspector general during the late 1990s (discussed further below).

Nonetheless, EPA guidance issued in 2001 requires that state inspectors only visit facilities once every five years. This policy is reflected in the results of our survey of state and local air pollution control agencies in the 10 states that this report highlights. As set forth in Figure 8, these states have relatively few inspectors available to monitor compliance of permitted air facilities.

Figure 8—Permitted Air Facilities and Inspectors[25]

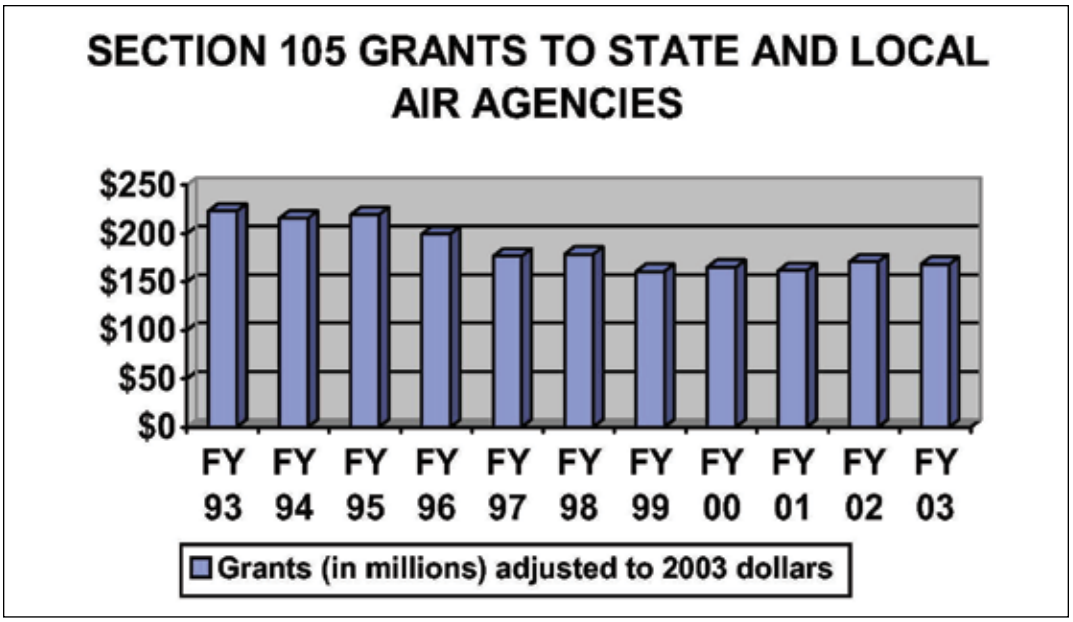
State	Number of Title V (Major) Permitted Facilities	Number of Non-Title V Permitted Facilities	Total Number of Permitted Air Facilities	Number of Inspectors	Ratio of Inspectors to Permitted Facilities
California	1,069	59,191	60,260	364	1:166
Georgia	440	3,086	3,526	31	1:114
Illinois	700	6,050	6,750	36	1:188
Michigan	489	3,877	4,366	70	1:62
New Jersey	323	5,452	5,775	42	1:138
New York	478	6,103	8,378	89	1:74
North Carolina	394	3,014	3,408	111	1:31
Ohio	705	11,553	12,258	125	1:98
Pennsylvania	620	2,000	2,620	81	1:32
Texas	1,729	49,000	50,729	144	1:352

Declining Resources for State Inspections

The authors of the Clean Air Act envisioned funding of state and local air pollution control agencies as a cooperative venture, with Section 105 of the CAA authorizing the federal government to provide grants equaling up to 60 percent of the cost of state and local programs.[26] In reality, however, state and local governments provide well over 75 percent of the funding, with the federal share representing approximately 25 percent.[27]

Moreover, as shown in Figure 9, between 1993 and 2003, Section 105 grants from the federal government to state and local air quality agencies have declined by 25 percent when adjusted for inflation[28]—at the same time there has been an increase in the responsibilities of state and local agencies.[29] In 1998, a joint study by the EPA and STAPPA/ALAPCO, which represents state and local air pollution officials, concluded that an increase of $98 million in federal Section 105 grants would be needed for state and local air agencies to operate a good (not perfect) program in fiscal year 1999.[30]

Figure 9—Declining Federal Support for State and Local Air Pollution Control



The picture has continued to worsen in recent years. President Bush's FY 2007 budget request calls for a $15.6 million reduction in the Section 105 air grants program.[31] STAPPA/ALAPCO, concerned that "such a reduction would be devastating to state and local air quality programs, which are already underfunded," surveyed state and local agencies to get an idea of the adverse impacts the funding cuts would have on their programs.[32] Many agencies, including agencies in six of the states covered in this report, reported that the reductions would impair their ability to conduct inspections and carry out enforcement activities, "thus rendering clean air requirements less effective."[33]

The Santa Barbara County Air Pollution Control District in California summed up the potential impact of the budget cuts on its own program as follows:

> *If we were to reduce an inspector position to make up for the lost revenue, we would have to eliminate 150 inspections that we conduct throughout the year. There is clear evidence that an adequate inspection program reduces excess air pollution emissions and the associated health impacts on our community and provides equity in the marketplace by discouraging scofflaws. Fewer inspections mean that our children and the public at large will be subject to greater emissions that can adversely affect their health and well-being. This is not the direction that our programs should take.*[34]

The EPA's Failed 'Compliance Monitoring Strategy'

In 1998, the EPA's Office of Inspector General, or OIG, released the results of six audits examining the EPA's oversight of state air enforcement. These audits "disclosed fundamental weaknesses with state identification and reporting of significant violators" of the Clean Air Act.[35] In some cases, the states detected violators but did not want to report them to the EPA.[36] In others, the superficial nature of the inspections failed to detect the violations.[37]

The combination of superficial inspections and shoddy documentation resulted in significant violators of the Clean Air Act going undetected for years. Noting that "[i]nspections are the front line of an enforcement program upon which all other aspects of the program are built," the OIG warned that deficient inspections hamper the EPA's entire enforcement program.[38] In no uncertain terms, the OIG report urged the EPA to enforce state compliance with the CMS and its inspection requirements.[39]

In the wake of the revelations contained in OIG's report, the EPA's Office of Enforcement and Compliance Assurance, or OECA, launched a review of the agency's Compliance Monitoring Strategy, which sets state inspection requirements. This CMS review revealed that there was wide variation in the extent to which the EPA's regional offices and the states actually adhered to the CMS.[40] Both expressed resistance to "any guidance that is highly prescriptive" and desired "greater flexibility in the CMS and in EPA's compliance monitoring policies in general."[41] Moreover, both the regional offices and the states wanted to see the EPA reconsider, revise, and/or relax the level of inspection required to make a compliance determination.[42]

Ultimately, OECA's review concluded that "[a]ll agree that the CMS as currently written is out-of-date and should be updated to achieve its potential effectiveness."[43] The review explicitly acknowledged the OIG report's findings concerning inadequate inspections,[44] but did not provide any suggestions as to how a revised, more flexible, less prescriptive CMS would address these failures.

This omission notwithstanding, in 2001, the EPA issued a revised CMS, which adopted many of the suggestions included in OECA's 1999 review. The new CMS recited that the OIG had identified the lack of consistent implementation of the CMS as "a fundamental problem that adversely affected the effectiveness of the air enforcement program."[45] But it did nothing to respond to the problem of inadequate inspections. On the contrary, it lowered inspection requirements.[46]

While the 1991 CMS required a detailed, on-site inspection to evaluate compliance, the 2001 CMS provides that review of self-reported information is sufficient for a "Full Compliance Evaluation." Stating that "on-site visits *may not be necessary to evaluate the compliance status of a facility* given the wide range of *self-reported* information such as annual Title V" monitoring, recordkeeping, and reporting requirements,[47] the revised CMS explicitly recommends an on-site inspection for Title V sources *only once every five years*."[48] This, apparently, is supposed to be sufficient "to ensure a compliance presence in the field, verify record reviews, observe modifications or new construction, and identify any major permit deviations."[49]

The EPA's current policy is not based on evidence indicating that facilities comply with their permits whether or not they are inspected. Nor was the shift based on evidence that self-reported information is sufficient to evaluate facilities' compliance. Rather, it was the failure of states and regions to comply with the CMS, bolstered by their arguments that the CMS was too inflexible and prescriptive, that led the EPA to simply discard the major tenets of its inspection strategy. This shift in policy is particularly inappropriate given that it was made in the wake of an investigation that confirmed that major violations of the Clean Air Act were going undetected due to inadequate inspections.

Since the EPA issued its revised CMS in 2001, no follow-up evaluation has been performed by OIG to determine whether the kind of significant violations revealed by its previous audits are continuing to go undetected by the agencies responsible for ensuring compliance with permit terms.

Air Quality Warnings & Effects on Public Health

Numerous Days Designated 'Code Orange' or Higher

Local governments provide air quality forecasts based on the EPA's national Air Quality Index, or AQI, to "help local residents protect their health by alerting them to plan their strenuous activities for a time when air quality is better." In all too many areas, during the summer, along with forecasts for high heat and humidity, the morning news is likely to include a "Code Orange" or even "Code Red" warning for ozone. On such a day, the following warning is issued:

> *Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.*[51]

The warning is extraordinary—the air is so bad that people are warned, essentially, to stay inside. What determines whether a "Code Red" warning is issued? The EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act[52] based on air quality standards.[53] When AQI values are above 100, "air quality is considered to be unhealthy—at first for certain sensitive groups of people, then for everyone as AQI values get higher."[54] When local governments forecast that ozone levels will exceed the ozone standard, they issue the appropriate warning according to the color scale shown in Figure 11.[55]

For ground-level ozone, at an AQI value of 100, a "Code Orange" warning is issued. Even on a Code Orange day, active children, adults and people with respiratory disease are cautioned to limit prolonged outdoor exertion, a caution that the EPA suggests people can heed, for example, by "walking instead of jogging, or jogging for half your usual time."[56] Figure 10 shows the number of days per year between 1990 and 2003 on which the ozone AQI exceeded 100 (those days on which the ozone AQI value was Code Orange and above) in major cities of the 10 states covered in this report.

Figure 10—Number of Days Code Orange and Above for Ozone, 1990-2005[57]

State	Metropolitan Statistical Area	Trend Sites	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
CA	Bakersfield	5	95	107	100	97	98	104	109	55	75	88	82	85	89	116	103	54
	Fresno	5	56	81	69	59	55	61	70	75	67	81	78	92	91	96	23	29
	Los Angeles-Long Beach	12	120	115	132	106	105	87	57	27	39	13	21	29	35	61	35	22
	Oakland	6	1	2	2	3	1	8	4	0	6	6	1	2	4	2	0	0
	Orange County	2	38	35	33	22	14	8	6	3	5	1	3	2	0	3	1	0
	Riverside-San Bernardino	13	152	152	172	167	148	119	115	102	94	93	95	92	95	101	85	81
	Sacramento	7	41	33	48	20	36	41	40	14	27	37	28	34	39	32	22	29
	San Diego	8	96	67	66	58	46	48	30	14	32	16	14	16	13	6	8	5
	San Francisco	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
	San Jose	3	4	5	3	4	2	11	7	0	5	1	0	3	4	4	0	1
	Ventura	4	65	85	53	41	63	65	62	42	29	22	27	18	9	20	11	10
GA	Atlanta	3	42	23	20	36	15	35	25	31	50	61	26	8	20	5	9	8
IL	Chicago	14	4	23	6	3	6	23	6	9	10	14	0	15	17	4	1	14
	St. Louis, MO-IL	13	22	23	14	9	31	34	20	14	23	29	14	14	30	9	0	20
MI	Detroit	7	11	27	6	5	11	12	12	11	17	14	3	16	21	7	0	12
	Grand Rapids-Muskegon-Holland	4	9	25	5	3	14	18	9	10	19	21	3	11	20	7	1	13
NJ	Jersey City	1	15	25	9	19	12	16	5	9	7	17	3	6	6	2	1	6
	Middlesex-Somerset-Hunterdon	1	24	24	8	13	9	16	8	18	21	23	8	12	19	6	6	12
	Monmouth-Ocean	2	21	20	11	24	13	20	17	21	31	27	11	21	31	12	8	16
	Newark	1	21	31	10	13	11	20	11	13	22	21	6	13	27	4	0	3
NY	Albany-Schenectady-Troy	3	4	9	5	5	6	3	4	3	3	6	1	11	8	5	2	3
	Buffalo-Niagara Falls	2	7	9	3	1	4	6	3	1	13	8	5	13	21	7	0	5
	Nassau-Suffolk	2	20	25	7	17	15	10	8	12	11	18	5	3	13	6	3	9
	New York	2	14	28	4	11	13	16	11	22	14	21	11	11	24	7	2	11
	Rochester	2	5	16	2	0	1	6	0	6	4	9	1	5	13	3	0	0
	Syracuse	2	0	12	2	4	1	5	0	2	3	4	1	4	9	2	0	2
NC	Charlotte-Gastonia-Rock Hill, NC-SC	2	29	11	9	23	9	11	16	24	47	34	18	12	25	4	3	9
	Greensboro-Winston Salem-High Point	2	12	5	2	20	7	6	6	13	25	20	11	9	23	3	0	1
	Norfolk-Virginia Beach-Newport News, VA-NC	3	8	7	8	19	6	6	4	17	15	16	5	6	15	4	1	1
	Raleigh-Durham-Chapel Hill	1	15	5	0	11	2	1	1	13	21	26	6	4	17	5	0	2
OH	Akron	2	9	30	8	10	8	12	11	6	14	20	4	12	22	4	3	10
	Cleveland-Lorain-Elyria	5	10	23	10	12	22	21	16	10	19	16	4	13	28	6	4	14
	Columbus	2	3	17	5	3	9	15	13	7	17	19	4	6	16	4	0	5
	Dayton-Springfield	3	13	12	2	11	14	11	18	9	19	19	6	4	26	4	1	6
	Toledo	2	2	5	2	7	8	9	11	4	5	4	2	9	13	6	1	6
	Youngstown-Warren	1	0	0	8	7	1	8	6	7	15	10	2	5	16	4	0	2
PA	Allentown-Bethlehem-Easton	1	9	10	1	3	3	7	6	12	18	19	5	9	18	4	3	6
	Harrisburg-Lebanon-Carlisle	3	10	21	1	15	12	13	3	9	22	17	5	17	17	3	1	6
	Philadelphia, PA-NJ	8	39	49	24	51	25	30	22	32	37	32	17	27	33	13	9	20
	Pittsburgh	7	8	20	8	13	19	24	11	20	39	23	4	15	24	5	1	9
	Scranton-Wilkes Barre-Hazleton	4	9	17	3	10	7	12	4	11	7	12	1	10	16	3	0	2
TX	Austin-San Marcos	1	4	3	1	2	4	10	0	0	5	8	6	0	5	3	2	1
	Dallas	1	0	0	5	10	24	20	8	20	24	16	20	14	6	5	9	10
	El Paso	2	6	0	3	3	2	3	1	0	6	0	3	1	4	0	0	2
	Fort Worth-Arlington	2	16	20	7	9	31	28	14	14	17	19	16	17	23	22	11	22
	Houston	7	51	36	32	27	38	65	26	46	38	50	41	26	20	30	22	28
	San Antonio	1	4	2	0	3	3	17	2	3	6	9	0	0	17	4	4	3

Health Effects

Ozone's adverse effects on the health and well-being of the more than 158 million people living in nonattainment areas around the country are well documented. According to the EPA, "[g]round-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country."[58] Ozone exposure affects everyone, but the EPA has identified several groups of people that are particularly sensitive to it:

- ***Active children***, the group at highest risk from ozone exposure because they often spend a large part of the summer playing outdoors;
- ***Active adults*** of all ages who exercise or work vigorously outdoors; and
- ***People with asthma or other respiratory diseases***, whose lungs are more vulnerable to the effects of ozone.[59]

Another reason children are especially susceptible to the adverse health effects of ozone exposure is that they are more likely to have asthma.[60] Over the last decade, childhood asthma rates have skyrocketed. The CDC estimates that self-reported asthma cases increased by 75 percent from 1980 to 1994, with the largest increases in prevalence occurring in children. Forty percent of asthma sufferers are children under 18, although children comprise only 25 percent of the population. CDC experts estimate that nine million American children have been diagnosed with asthma.[61]

About 90 percent of the ozone a person inhales remains in the lungs,[62] where it causes a range of health effects identified by the EPA, including:

- ***Permanent lung damage.*** In children, repeated short-term ozone damage to developing lungs may lead to reduced lung function in adulthood, and in adults, ozone exposure accelerates the natural decline in lung function that occurs as part of the normal aging process.
- ***Aggravated asthma***, which results in more people with asthma having attacks that require the use of additional medication or a doctor's attention.
- ***Aggravated chronic lung diseases***, such as emphysema and bronchitis. People with these conditions experience reductions in the immune system's ability to fight off bacterial infections in the respiratory system.
- ***Reduced lung function***, which makes it more difficult to breathe as deeply and vigorously as normal, and may result in more rapid and shallow breaths than normal.
- ***Irritation of the respiratory system***, which causes coughing, throat irritation, and/or an uncomfortable sensation in the chest.[63]

Figure 11—EPA's Air Quality Index

Air Quality	Air Quality Index	Protect Your Health
Good	0-50	No health impacts are expected when air quality is in this range.
Moderate	51-100	Unusually sensitive people should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups	101-150	Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
Unhealthy	151-200	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
Very Unhealthy (Alert)	201-300	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

Source: U.S. EPA

The Clean Air Act & Ozone: A History of Extended Deadlines

Statutory Extensions

In 1970, nearly four decades ago, Congress made eliminating dangerous levels of ozone in the air a national priority with passage of the Clean Air Act. Under the CAA, the EPA is responsible for setting standards and timelines for reducing the most common and harmful air pollutants, and states must bring all areas within their boundaries into attainment with these standards.[64] The deadline to attain the ozone standard, however, has come and gone, been extended and re-extended, and still hundreds of counties across the country fail to attain.

Congress originally required that state implementation plans demonstrate that clean air standards would be attained throughout the country by 1975, or mid-1977, at the latest.[65] When a number of areas failed to meet that deadline, the 1977 amendments to the CAA extended the deadline to 1982 (or 1987 for areas demonstrating that attainment by 1982 was not possible)[66] and authorized the EPA to impose sanctions on states that did not submit adequate plans or missed their attainment deadlines.[67]

In 1987, with many areas still far from attainment, the General Accounting Office told Congress that in its view, the EPA needed either to impose the sanctions required by the Act or seek legislative relief.[68] The GAO recommended that Congress, if it chose to extend the deadline, set attainment dead-

lines according to the severity of the ozone problem in a given area.[69] When Congress amended the Act in 1990, it followed this recommendation, giving areas with the worst ozone problems the most amount of time to achieve attainment.[70] Under this framework, the worst areas, labeled "severe" and "extreme," were required to attain air quality standards by 2005 and 2010, respectively.[71]

The 8-Hour Standard

As the deadlines set under the 1990 Clean Air Act Amendments were drawing near, the EPA revised the ozone standard—this time, without congressional action—and extended the attainment deadlines yet again. The first ozone standard, established in 1970 and known as the "one-hour" standard, was set at 120 parts per billion (ppb).[72] It was measured over a one-hour period. In the years following the establishment of the one-hour standard, however, scientific research indicated that even ozone levels in compliance with that standard produced symptoms in moderately exercising adults, especially over longer periods of exposure.[73]

In 1997, after reviewing 190 scientific studies, the EPA revised the ozone standard, lowering the level of acceptable ozone to 80 ppb, measured over eight hours.[74] While the 1-hour standard protected against peak ozone exposure, the 8-hour standard is designed to protect against both ozone peaks and lower, chronic levels of ozone exposure.

Compliance under the 8-hour standard is determined by averaging the fourth highest reading in each of three years for a given area.[75] If the resulting value exceeds the ozone standard, the area is considered as being in "nonattainment" for ozone—that is, failing to attain the standard that the EPA has determined is necessary to protect public health. Implementation of the new standard was delayed for years by litigation.[76] However, in April 2004 when the EPA issued its final designation of nonattainment areas under the new standard, areas in 32 states and the District of Columbia were included.[77] The 8-hour ozone nonattainment areas now encompass 462 counties nationwide,[78] shown in Figure 2.[79]

Some areas that had been considered in "attainment" under the 1-hour standard were designated as "nonattainment" under the 8-hour standard, and thus became subject to requirements of the Clean Air Act that had not previously applied to them. However, the 8-hour standard resulted in a significant "relaxation of the act's requirements for the most severely polluted areas"—yet another extension of the attainment deadlines.[80] Specifically, areas that were required to attain the ozone standard by 2005 or 2010 under the 1-hour standard may eventually be allowed until 2021—*as many as 16 additional years*—to attain the 8-hour standard.[81]

Conclusion

Nineteen years ago, before passage of the 1990 Clean Air Act Amendments, the GAO warned that slowing progress toward the EPA's ozone standard resulted from "the apparent reluctance of some government officials to make politically unattractive and difficult regulatory decisions."[82] The EPA's effective abandonment of federal guidelines on inspections of stationary sources, combined with a continued decline in federal funding for state and local air pollution control agencies, suggests a similar lack of political will today.

Nearly four decades after the Clean Air Act first established reducing ground-level ozone pollution as a national priority, 462 counties in 119 areas across the country still fail to attain the EPA's standard. More than 158 million people nationwide—and 113 million people in the 10 states highlighted in this report—must continue to heed repeated warnings to stay inside during the summer months if they wish to avoid the ozone's adverse impacts on their health.

In 1998, the EPA's inspector general determined that the programs in place to control emissions by stationary sources (a significant contributor to both of ozone's precursor pollutants) were being compromised due to the failure of states to conduct thorough on-site inspections often enough. Rather than enforce compliance with its inspection policy as its inspector general recommended, however, the EPA opted to abandon its policy in favor of increased reliance on self-reporting techniques. Meanwhile, with no follow-up report to evaluate the effectiveness of this new policy in sight, state and local air pollution control agencies report continued underfunding, a problem that contributes to the states' inability to keep up with inspections. President Bush's proposed budget for 2007 threatens to cut funding even further.

If Congress, the administration, and the EPA ever want to bring ozone levels across the country finally into attainment with the ozone standard, they must create the conditions necessary for a return to a vigorous enforcement program. Two important steps should be taken immediately to demonstrate commitment on the part of the administration and Congress:

- The EPA's inspector general should initiate a series of follow-up audits to determine whether the problems it identified with inspections in 1998 continue today, and if so, enforce compliance with the inspection parameters set forth in the 1991 version of the CMS; and

- Congress should reject the proposed cuts to funds for state and local air pollution control agencies, and instead increase funds to close the $98 million funding gap identified by the EPA and STAPPA/ALAPCO in 1998, adjusted to reflect current needs.

Controlling ground-level ozone is a multi-faceted problem calling for continued vigilance on many fronts. These actions could begin to address the basic, yet neglected, priority of ensuring stationary source compliance with permits.

Appendix—Methodology

In addition to the information concerning data sources set forth in footnotes throughout the text of this report, the following information describes our methodology and underlying data.

Census Data

Census data were obtained from Census 2000, through American FactFinder, a user-friendly Internet-accessible database.[83] The following categories of information were obtained for each county: total population of counties designated as nonattainment under the EPA's 8-hour standard,[84] children 9 and under in those counties, and persons 75 and older in those counties. Specifically, data were obtained from (and, for aggregations of age groups, calculated from data provided in) Table DP-1, *Profile of General Demographic Characteristics: 2000* (from Summary File 1 (SF-1) 100-Percent Data).

American Lung Association Data

Numbers of persons suffering from respiratory conditions within the nonattainment areas were obtained from the American Lung Association's *State of the Air 2006* Report.[85] "Persons suffering from asthma" as reported herein represents the sum of the ALA's estimates of pediatric[86] and adult asthma.[87] Estimates of persons suffering from chronic bronchitis and emphysema are both for the population 18 and over.[88] The ALA cautions that "adding across rows does not produce valid estimates, i.e. summing pediatric and adult asthma and/or emphysema and chronic bronchitis."[89]

The ALA also notes that its report grades only those counties with air quality monitors. Importantly, however, air pollution does not respect political boundaries and may be a public health hazard regardless of whether a community has a monitor in place. Air pollution can be blown by the wind or formed mid-air through complex chemical reactions that disperse the pollution far beyond its source. The monitors, however, provide an overall picture of the air quality in a larger region, a picture that helps shape efforts to curb the pollution.[90]

Top 5 VOC-Emitting Facility Data

Identity and emissions of the five largest emitters of VOCs in each of the states highlighted in this report were obtained from Scorecard.org,[91] a user-friendly database originally established by Environmental Defense, which provides information from a variety of data sources to the public. Scorecard's data on emissions of criteria air pollutants are derived from the EPA's National Emissions Trends database. The NET database, in turn, contains emissions levels from mobile, area, and point sources for counties across the U.S., including detailed emissions data for over 50,000 point sources (industrial and other facilities).

According to Scorecard.org:

> Emissions data are currently available for 1999. The EPA conducts a comprehensive emissions inventory every three years. The EPA also modifies the NET database at least annually to correct and augment its inventory data. Currently the NET database has point source emissions data for year 1999, and county-level aggregate emissions from all source types for years 1985-1998.
>
> The EPA's methodology for constructing the NET database is described in its National Emissions Inventory (NEI) Air Pollutant Emissions Trends. States collect emissions data and report it to the EPA for compilation in the NET database, so data quality, completeness, and reporting years can vary from state to state. States sometimes use different methods to develop data for specific pollutants and sources (e.g., direct reporting vs. estimates based on emissions factors). Since not all states provide specific information for all sources, the EPA must also sometimes estimate emissions to complete the data record for a state.
>
> The NET database breaks all air pollution generating activities into Source Classification Codes (SCCs). These classifications are used to develop estimates and projections of air pollutant releases, and to identify the major pollution generating activities within specific source categories.
>
> NOTE: The NET is an emissions database developed by the EPA for its internal use. The NET is based partially on emission data obtained from state and local agencies, but it is not an official compilation of state emissions data. There are known inconsistencies between the EPA's NET and official state emission inventories. Scorecard's emissions data were derived from a 2001 version of the NET database, which is incrementally modified by the EPA to generate the online NET database, which captures corrections to facility or area criteria emissions data made by companies or state agencies.[92]

Permit and Facility Count Methodology

All of the permit and inspector numbers provided in this report were obtained from state and local air pollution control agency officials. Numbers of permitted facilities must be regarded as approximate, as the total number of permits changes frequently based on facility startups and shutdowns, and modifications. Also, numbers of inspectors do not reflect the number of full-time equivalents devoted solely to conducting on-site inspections of permitted air facilities; instead these are the aggregate numbers of inspectors available to conduct those inspections.

According to our contacts, the amount of time spent conducting on-site inspections (as opposed to other related job duties) ranges anywhere from 10-20 to 100 percent. Inspector numbers represent current staffing as of summer 2006. Some jurisdictions may have added or lost inspectors since then.

Each state agency's organizational and management structure is unique, with varying degrees of centralized versus dispersed enforcement and permitting powers. Moreover, it is critical to note from the outset that each state's permitting of non-Title V sources varies considerably both as to type of permits issued and categories of sources permitted. Accordingly, results may reflect certain jurisdictions' issuing permits to gas stations, while other jurisdictions do not require gas stations to obtain operating air permits. This is consistent with the Clean Air Act's federal implementation structure: section 101(a) of the act states that "air pollution prevention . . . and air pollution control at its source is the primary responsibility of States and local governments."

In order to ensure the completeness of the data used in this report, research began at each of the 10 state's web sites. The goal of this research was to determine who within each agency had access to data on the number of major (Title V), synthetic minor, and minor sources operating under operating permits within the state. In addition, the web sites were consulted to determine who within each agency had access to information concerning inspections of the operating facilities. To begin with, the organizational structure was consulted. For all the states, a generic environmental protection agency exists. Within that agency, duties are divided among different branches, including a branch in charge of air pollution control. This branch was usually further subdivided into offices, usually consisting of an office in charge of permitting and an office in charge of compliance and enforcement.

As a primary resource for information on the number of permits and persons inspecting facilities, the office of permitting was contacted. After framing the questions (i.e., "1. approximately how many: a) Title V (major); and b) non-Title V facilities currently operate under operating permits within the state; and 2) how many persons are available to conduct on-site inspections of those facilities), the person answering the call was asked whether they could direct the caller to the source of such information. In some cases the person answering was able to provide the information. In other cases, the caller was directed to another person within the office and/or directed to the office of compliance and enforcement for further information. In addition, in some cases, responsibility for permitting and enforcement was delegated to district or regional offices. At times, the caller was referred to these sources for the most current and accurate information concerning the approximate number of permitted facilities and the number of persons inspecting these facilities. To ensure that all localized agencies were contacted, the organizational chart at the state website was again consulted. In that case, each of the local agencies was contacted for the information on permits and inspectors. Frequently, the agency representative asked that the request for information be submitted in writing, usually via electronic mail. The sum of all permitted facilities and all persons inspecting those facilities is reported here.

Records concerning both telephone and written correspondence were maintained and are on file with the authors. Information obtained over the telephone was confirmed by sending letters to the individual contacts at each agency. These letters set forth the information that was first provided over the telephone, and asked that any inaccuracies be corrected as soon as possible, but no later than August 25, 2006. The following subsections detail, on a state-by-state basis, how the numbers used in this report were obtained.

California: Primary responsibility for implementing and enforcing the CAA in California rests with the California Air Resources Board ("ARB"). The ARB has delegated its stationary source permitting and enforcement authority to 35 regional authorities known as Air Pollution Control Districts ("APQDs") or Air Quality Management Districts ("AQMDs").[93] The ARB itself informed us that for Title V facilities—the count provided through the EPA's Enforcement and Compliance History Online (ECHO) database—was accurate and up-to-date, but that non-Title V facilities and inspector figures would need to be obtained from the 35 District offices. We contacted each of the 35 District offices; the results reported are the sum of the numbers obtained from each office. The non-Title V facility count does not include 55 gas stations within the Northern Sierra Air Quality Management District or 2,588 gas stations in the Bay Area Air Quality Management District, as neither district includes those facilities in the responsibilities of its inspectors who visit other non-Title V facilities. Similar arrangements may exist in other local air quality management districts in California, so the total count of non-Title V facilities may exceed the number of facilities for which the inspectors reported are actually responsible.

Georgia: The Air Protection Branch of the Georgia Department of Natural Resources, issues permits to stationary sources and enforces those permits. Staff from the Air Protection Branch's Stationary Source Permitting Program provided the total number of permits. The total number of inspectors used in this report came from the Stationary Source Compliance Program.

Illinois: The Illinois Environmental Protection Agency's Bureau of Air, Division of Air Pollution Control is responsible for CAA permitting and enforcement of stationary sources.[94] We were able to obtain permit and inspector numbers from the Division's central office. Illinois EPA groups CAA operating permits into three categories: lifetime permits (for minor sources), federally enforceable state operating permits (synthetic minor sources and sources emitting pollutants within 80 percent of the Title V threshold), and Title V permits. It must be noted that upon receipt of our letter attempting to ensure the accuracy of the information concerning the number of Title V and non-Title V permitted facilities we were given over the telephone, the state did not confirm or deny the number, but instead notified us that in order to receive a "formal" response, we would be required to submit a Freedom of Information Act (FOIA) request.

New Jersey: Stationary sources in New Jersey obtain air permits from the Department of Environmental Protection's Air Quality Permitting Program ("AQPP").[95] The Department has a compliance and enforcement branch that oversees the Air Compliance & Enforcement Program.[96] This office provided us both with the number of inspectors and an Excel spreadsheet that details every permitted facility and its permit classification. The number of facilities for New Jersey that is set forth in the chart reflects those facilities inspected by the state. New Jersey delegates approximately 13,995 minor permitted facilities (such as drycleaners) to individual counties to conduct inspections as they see fit

New York: The Bureau of Stationary Sources within New York's Department of Environmental Conservation was able to provide total numbers for permits and enforcement officials. The number of operating permits issued by the state are divided into three categories: Title V permits, State Facility Permits (primarily synthetic minor permits), and permits found in the Air Facility Registration

(minor sources), and facilities that "cap-by-rule."[97] The number of non-Title V facilities reported for New York does not include approximately 1,715 permitted dry cleaners, which are not inspected by the state, but are instead inspected by third-party inspectors.

North Carolina: The Division of Air Quality within North Carolina's Department of Environment and Natural Resources (DENR) oversees permitting of stationary sources. Staff from the central office was able to provide the total number of permits used in this report. The accuracy of the permitted facility count was ensured by letter to DENR. Authority to inspect permitted facilities has been delegated to 10 local offices spread throughout the state. Seven of those 10 offices have jurisdiction over multiple counties, while three counties (Mecklenburg, Buncombe, and Forsyth) have exclusive authority over stationary sources within their borders. The total number of inspectors in North Carolina was derived by aggregating the number of inspectors provided by each of the 10 local offices. Numbers of inspectors for the local offices were confirmed by letter to each of those offices. The policy for frequency of inspections for non-Title V facilities reported herein reflects the policies adhered to by the seven regional air pollution control programs; inspection frequency within Mecklenburg, Buncombe and Forsyth counties may vary.

Michigan: The Michigan Department of Environmental Quality's Air Quality Division is responsible for permitting stationary sources and enforcing the permits.[98] Staff from the Permit Section of the Air Quality Division provided the number of permits used in this report, while staff from the Enforcement Unit provided the number of inspectors.

Ohio: Ohio EPA's Division of Air Pollution Control is responsible for both permitting and inspecting stationary sources of air pollution.[99] The Division of Air Pollution Control's Permitting Group was able to provide the total numbers for operating permits. The Compliance and Enforcement group within the Division of Air Pollution Control provided the number of inspectors used in this report.

Pennsylvania: The Pennsylvania Department of Environmental Protection's Bureau of Air Quality was able to provide total numbers for operating permits and inspectors. The Bureau of Air Quality's central office provided us with the number of inspectors at each of the Department's six regional offices and 17 district offices. The sum of these numbers is used in this report.

Texas: The Texas Commission on Environmental Quality has separate offices that handle permitting and enforcement. The Office of Permitting, Remediation & Registration's Air Permits Division oversees the permitting,[100] while the Office of Compliance and Enforcement handles inspections.[101]

Endnotes

1 Data concerning total population; number of people living in counties designated in whole or in part as nonattainment under the 8-hour standard; children nine and under; and persons 75 and older were obtained from Census 2000. For more detailed information, please see the Methodology section of this report.

2 Data concerning persons suffering from conditions aggravated by ozone were obtained from the American Lung Association's (ALA) *State of the Air: 2006* Report, *available* at http://lungaction.org/reports/stateoftheair2006.html (select state of interest, then click "Groups at Risk" tab to obtain data) (last visited Aug. 17, 2006). For more detailed information on the ALA data, please see the Methodology section of this report.

3 *See* U.S. Envtl. Prot. Agency, Green Book: 8-Hour Ozone Nonattainment Areas, *available* at http://www.epa.gov/air/oaqps/greenbk/gntc.html (last visited Aug. 31, 2006).

4 The states highlighted in this report are the top ten most populous states that contain areas designated as failing to attain EPA's ozone standard (ozone nonattainment areas).

5 U.S. Envtl. Prot. Agency, Ozone And Your Health, EPA-452/F-99-003 (Sept. 1999), available at http://airnow.gov/index.cfm?action=static.brochure (last visited Aug. 27, 2006) [hereinafter, "EPA, Ozone And Your Health"].

6 U.S. Envtl. Prot. Agency, *Air Emissions Trends – Continued Progress Through 2005*, *available* at http://www.epa.gov/airtrends/2006/econ-emissions.html (last visited Aug. 23, 2006).

7 U.S. Envtl. Prot. Agency, *Air Trends: Ozone, available* at http://www.epa.gov/airtrends/ozone.html (last visited Aug. 23, 2006) [hereinafter, "EPA, *Air Trends: Ozone*"].

8 *Id*. (last visited Sept. 19, 2006). As EPA explains, "[t]he blue band shows the distribution of air pollution levels among the trend sites, displaying the middle 80 percent. The white line represents the average among all the trend sites. Ninety percent of sites have concentrations below the top line, while ten percent of sites have concentrations below the bottom line." U.S. Envtl. Prot. Agency, *Air Trends: How to Interpret the Graphs, available at* http://www.epa.gov/airtrends/interpret.html (last visited Sept. 19, 2006) [hereinafter, "EPA, *Air Trends: How to Interpret the Graphs*].

9 EPA, *Air Trends: Ozone, supra* note 7. As EPA explains, "[t]he blue band shows the distribution of air pollution levels among the trend sites, displaying the middle 80 percent. The white line represents the average among all the trend sites. Ninety percent of sites have concentrations below the top line, while ten percent of sites have concentrations below the bottom line." EPA, *Air Trends: How to Interpret the Graphs, supra* note 8.

10 U.S. Envtl. Prog. Agency, Office Of The Inspector Gen., Epa and States Not Making Sufficient Progress in Reducing Ozone Precursor Emissions in Some Major Metropolitan Areas 12-13, Rep. No. 2004-P-00033 (Sept. 2004), *available at* http://www.epa.gov/oig/reports/2004/20040929-2004-P-00033.pdf (last visited Aug. 29, 2006).

11 *Id*. at 13; *See also* American Lung Association, State of the Air 2006: *National Analysis, available at* http://lungaction.org/reports/sota06_analyses1.html (last visited Aug. 29, 2006).

12 *See, e.g*., U.S. General Accounting Office, Gao/t-rced-87-8, Attainment of Epa's Ozone Standard 15 (Statement of J. Dexter Peach, Assistant Comptroller General; Resources, Community, and Economic Development Division before the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce) (Apr. 27, 1987) *available online at* http://archive.gao.gov/d39t12/134600.pdf (last visited Aug. 8, 2006) [hereinafter, "GAO, Attainment of Epa's Ozone Standard (1987 Testimony)"].

13 U.S. General Accounting Office, Air Pollution: Ozone Attainment Requires Long-term Solutions to Solve Complex Problems 8, GAO/RCED-88-40 (Jan. 1988), *available at* http://archive.gao.gov/d30t5/134947.pdf (last visited Aug. 29, 2006).

14 *See* U.S. Envtl. Prot. Agency, Ground-level Ozone: What is it? Where does it come from?, *available at* http://www.epa.gov/air/urbanair/ozone.what.html (last visited Aug. 22, 2006).

15 *Id*.

16 *Id*.

17 Morton Lippman, *Ozone*, in Environmental Toxicants, 655, 655 (Morton Lippman ed., 2d ed. 2000).

18 *See, e.g*., U.S. Envtl. Prot. Agency, Region 1: New England: *Sources of Hydrocarbon and NOx emissions in New England (2002), available at* http://www.epa.gov/ne/airquality/piechart.html (last visited Aug. 23, 2006).

19 Facility information obtained from Scorecard.org. For more detailed information, please see the Methodology section of this report.

20 U.S Envtl. Prot. Agency, Ozone: Good Up High, Bad Nearby, *What Causes Bad Ozone?, available at* http://www.epa.gov/oar/oaqps/gooduphigh/bad.html#6 (last visited Aug. 23, 2006).

21 42 U.S.C. § 7661 *et seq*. "Major" sources of NOx and VOCs are defined as follows. For ozone nonattainment areas, sources with the potential to emit: 1) 100 tons per year (tpy) or more of VOCs or NOx in areas classified as "marginal" or "moderate"; 2) 50 tpy or more in areas classified as "serious"; 3) 25 tpy or more in areas classified as "severe," and 4) 10 tpy or more in areas classified as "extreme." 40 C.F.R. § 70.2.

22 Title V permits issued by State and local permitting authorities are often called part 70 permits because the federal regulations that establish minimum standards for State permit programs are found at 40 C.F.R. Pt. 70. U.S. Envtl. Prot. Agency, *Air Permits: Basic Facts, available at* http://www.epa.gov/air/oaqps/permits/index.html (last visited Jun. 27, 2006). EPA also issues Title V permits (called "part 71" permits) to sources in Indian country and in other situations, as needed. *Id*.

23 42 U.S.C. § 7661c(c).

24 Arnold W. Reitze, Jr. & Carol S. Holmes, *Inspections Under the Clean Air Act*, 1 Envtl. Law. 29, 36 (1994) (citing Compliance Policy and Planning Branch, Office of Enforcement and Compliance Monitoring, U.S. Envtl. Prot. Agency, *Fundamentals of Compliance Monitoring Inspections*, 3-8 to -10 (Feb. 1989)). Other functions that inspections serve are:

- Identifying environmental problems and providing information on compliance patterns in the regulated community;
- Performing an oversight function when done by EPA and/or the state reviewing the effectiveness of delegated programs;
- Providing data on the adequacy of programs and the need for additional control;
- Promoting compliance through information and technology transfer communicated by inspectors;
- Providing data to support the issuance of permits;
- Providing government agency employees experience and familiarity with industrial processes and facilities;
- Making the source aware of any problems;
- Deterring violations; and
- Determining whether compliance orders have been obeyed. *Id*.

25 Figures obtained through telephone and e-mail communications with State and local air pollution control agencies. For more information, please see the Methodology section of this report.

26 The State and Territorial Air Pollution Program Administrators (Stappa) and the Association of Local Air Pollution Control Officials (Alapco), The Critical Funding Shortfall of State and Local Air Quality Agencies 5 (Feb. 2004), *available at* http://www.4cleanair.org/FundingNeedsOverview.pdf (last visited June 27, 2006).

27 *Id*.

28 *Id*. at 2.

29 *Id.* at 6.

30 *See id*. at 7.

31 The State and Territorial Air Pollution Program Administrators (Stappa) and the Association of Local Air Pollution Control Officials (Alapco), Impact of Proposed Fy 2007 Budget Cuts on State & Local Air Quality Agencies 4 (Mar. 2006), *available at* http://www.4cleanair.org/StateandLocalExamplesofImpactsofCuts.pdf (last visited Aug. 21, 2006). Additional cuts in the President's proposed budget that would impact state and local air quality control programs are: $17 million from the Section 103 fine particulate monitoring program and $2.5 million from regional planning organizations. *Id*.

32 *Id*.

33 *Id*. Among the agencies that predicted the budget cuts would impact their ability to conduct inspections were: Santa Barbara County, California (*id*. at 10); Illinois (*id*. at 22); New York (*id*. at 50); Mecklenburg County, North Carolina (*id*. at 53); Cleveland, Ohio (*id*. at 54); Mahoning-Trumbull Air Pollution Control Agency (Ohio) (*id*. at 55); Ohio Regional Air Pollution and Control Authority (*id*.); and Pennsylvania (*id*. at 59).

34 *Id*. at 10.

35 U.S. Envtl. Prog. Agency, Office of the Inspector Gen., Consolidated Report on Oeca's Oversight of Regional and State Air Enforcement Programs i, Rep. No. E1GAE7-03-0045-8100244 (Sept.1998), *available at* http://www.epa.gov/oig/reports/1998/8100244.pdf (last visited Aug. 29, 2006).

36 *Id*.

37 *Id*.

38 *Id*. at 17-18.

39 *Id*.

40 U.S. Envtl. Prot. Agency, Office of Enforcement and Compliance Assurance, Office of Compliance, A Review of the Compliance Monitoring Strategy 5-6 (July 1999).

41 *Id*. at 10, 16-17.

42 *Id*. States specifically mentioned the following categories as sources they did not believe warranted Level 2 inspection requirements: large gas and oil fired boilers, emergency generators, sources that are able to comply easily without control systems, and sources that are always found to be in compliance when inspected. *Id*.

43 *Id*. at 20.

44 *Id*. at 3-4.

45 U.S. Envtl. Prot. Agency, Clean Air Act Stationary Source Compliance Monitoring Strategy, § I (Apr. 2001), *available at* http://www.epa.gov/compliance/resources/policies/monitoring/cmspolicy.pdf (last visited Aug. 29, 2006) [hereinafter, "EPA, CMS"]. EPA convened a Workgroup, consisting of representatives from OECA Headquarters, the Regions and several States to review the findings of the 1999 review. The 2001 CMS is based on the recommendations of that Workgroup and discussions with the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA-ALAPCO). *Id*.

46 *Id*. at § VI(1).

47 *Id*. at § I(3).

48 *Id*. at § VI(3). States inspect their non-Title V permitted sources according to their own policies—the CMS focuses on Title V major sources and those synthetic minor sources that have the potential to emit (PTE) at or above 80 percent of the Title V major source threshold. *Id*. at § IV. Synthetic minor sources are those that have the potential to emit "major" amounts of air pollutants, but which actually emit amounts under major source thresholds. In order to provide such facilities the opportunity to avoid major source permitting requirements, state permitting agencies can provide enforceable mechanisms limiting their PTE. As seen below, absent federal guidance for the appropriate frequency with which to inspect non-Title V sources, wide variation exists among state policies.

State	CA	GA	IL	MI	NJ	NY	NC	OH	PA	TX
Policy for Frequency of Inspection for non-Title V permitted facilities	35 local agencies; policies range between twice per year and once every 3 years.	Upon complaint	Varies from upon complaint to once every 10 years	Varies from upon complaint to once every 5 years	Once every 10 years	No specific state policy	Attempt once every 2 years, once every 5 years at a minimum	As needed or upon complaint	Once every 5 years	According to a risk-based analysis, which is performed annually

49 EPA, CMS, *supra* note 45, at § VI(3).

50 U.S. Envtl. Prot. Agency, Air Quality Index: A Guide to Air Quality and Your Health, 4, EPA-454/K-03-002 (Aug. 2003), *available at* http://www.epa.gov/airnow/aqibroch/AQI_2003_9-3.pdf (last visited Aug. 27, 2006) [hereinafter, "EPA, AQI: A Guide to Air Quality and Your Health"].

51 U.S. Envtl. Prot. Agency, *Air Quality Guide for Ozone, available at* http://www.airnow.gov/index.cfm?action=static.consumer (last visited Aug. 21, 2006) [hereinafter, "EPA, *Air Quality Guide for Ozone*"].

52 U.S. Envtl. Prot. Agency, *Air Quality Index: A Guide to Air Quality and Your Health, available at* http://www.airnow.gov/index.cfm?action=static.aqi (last visited Aug. 21, 2006) [hereinafter, "EPA, *AQI: A Guide*"]. The AQI is calculated for: ground-level ozone, particle pollution (particulate matter), carbon monoxide, sulfur dioxide and nitrogen dioxide. *Id*.

53 *Id*.

54 *Id*.

55 EPA, *Air Quality Guide for Ozone, supra* note 51.

56 "EPA, AQI: A Guide to Air Quality and Your Health," *supra* note 50.

57 Data for Metropolitan Statistical areas in states covered in this report obtained from U.S. Envtl. Prot. Agency, *Air Trends: Fact Book and Related Information, available at* http://www.epa.gov/airtrends/factbook.html (click on "Number of Days with an Air Quality Index Values Greater than 100 at Trend Sites, 1990-2005, and All Sites in 2005, Ozone Only" hyperlink) (last visited Sept. 19, 2006). "Trend sites" are sites having an adequate record of monitoring data during the trend period. *Id*.

58 EPA, *AQI: A Guide, supra* note 52.

59 EPA, Ozone and Your Health, supra note 3.

60 *Id*.

61 For further information about these population trends, see U.S. Department of Health and Human Services, Centers for Disease Control Prevention, "Summary Health Statistics for U.S. Children: National Health Interview Survey, 2003," (2005) (Series 10, No. 223), 4, *available at* http://www.cdc.gov/nchs/data/series/sr_10/sr10_223.pdf (last visited Sept. 5, 2006).

62 *See* H.R. Rep. No. 101 - 490, at 199 (1990).

63 EPA, Ozone and Your Health, *supra* note 3.

64 Congress directed EPA to establish national ambient air quality standards (NAAQS) "for each air pollutant for which air quality criteria have been issued." 42 U.S.C. § 7409(a)(1), CAA § 109(a)(1). Primary NAAQS are to protect the public health, while "secondary" NAAQS are to "protect the public welfare from any known or anticipated adverse effects". *Id*. at §§(b)(1) & (2). Air quality criteria are to "accurately reflect the latest scientific knowledge" and describe the characteristics and potential health and welfare effects of pollutants. 42 U.S.C. § 7408(a)(2); CAA § 108(a)(2). EPA has issued air quality criteria and established NAAQS for only six of the most common and harmful air pollutants (thus termed the "criteria" pollutants): lead, NO_x, carbon monoxide, sulfur

dioxide, particulate matter – and ozone. EPA has promulgated two NAAQS for particulate matter – one governing "coarse" particulates, or "PM_{10}" (for particulate matter ranging from 2.5 to 10 micrometers in diameter) and one governing "fine" particulates, or "$PM_{2.5}$" (for particulate matter less than 2.5 micrometers in diameter). *See* U.S. Envtl. Prot. Agency, *PM Standards, at* http://www.epa.gov/air/particlepollution/standards.html (last visited July 5, 2006). Fine particulates are believed to post the largest health risks since, because of their small size, they can lodge deeply into the lungs. *See*, e.g., U.S. Envtl. Prot. Agency, *PM_{10} NAAQS Implementation, available at* http://www.epa.gov/ttn/naaqs/pm/pm10_index.html (last visited July 5, 2006).

65 *See, e.g.*, GAO, Attainment of Epa's Ozone Standard (1987 Testimony), *supra* note 12, at 3. Like most major environmental programs, the standards under the Clean Air Act are written by the federal government, but implemented by the States. States wishing to participate – in almost all instances, the vast majority – apply to EPA for a "delegation of authority." 42 U.S.C. §7409. Assuming their applications demonstrate adequate capacity to undertake permit writing and enforcement, EPA grants the delegation, and often provides financial contributions to help States run federally designed programs. The state is then obligated to prepare a "State Implementation Plan," or SIP, for each of the six criteria pollutants. 42 U.S.C. §7410. SIPs for areas that are *non*attainment are subject to the most stringent requirements.

66 *See, e.g.*, GAO, Attainment of Epa's Ozone Standard (1987 Testimony), *supra* note 12, at 3-4.

67 Sanction provisions for ozone non-attainment areas appear at 42 U.S.C. §§7509, 7511(d) (2000). EPA also has enforcement authority under 42 U.S.C. §7413 (2000).

68 GAO, Attainment of Epa's Ozone Standard (1987 Testimony), *supra* note 12, at 15.

69 *Id*. at 16.

70 Areas were classified as "extreme," "severe," "serious," "moderate," and "marginal." 42 U.S.C. §§7501-7515 (2000).

71 42 U.S.C. § 7511(a)(1).

72 44 Fed. Reg. 8202 (Feb. 8, 1979).

73 *See* James E. McCarthy, *Implementation of EPA's 8-Hour Ozone Standard* 2, Cong. Research Serv. RL32345 (2004).

74 *Id*.

75 *Id*.

76 *See Whitman v. American Trucking Associations*, 531 U.S. 457 (2001). The case, brought by a broad coalition of industries and trade associations, challenged EPA's decisions to tighten the ozone NAAQS, as well as its decision to expand the particulate matter NAAQS to cover significantly smaller particles.

77 U.S. Envtl. Prot. Agency, *8-hour Ozone National Ambient Air Quality Standards: Final Rules*, 69 Fed. Reg. 23858 (Apr. 30, 2004); *See also* McCarthy, *supra* note 73, at 1.

78 U.S. Envtl. Prot. Agency, *8-hour Ozone National Ambient Air Quality Standards: Final Rules*, 69 Fed. Reg. 23858 (Apr. 30, 2004). For the total number of counties included in designated nonattainment areas following reclassifications (*see, e.g.*, U.S. Envtl. Prot. Agency, *Air Quality Classifications for 8-hour Ozone National Ambient Air Quality Standards: Final Rule*, 69 Fed. Reg. 56697 (Sept. 22, 2004)), *see* U.S. Envtl. Prot. Agency, Green Book: 8-hour Ozone Nonattainment Areas (as of March 2, 2006), *available at* http://www.epa.gov/air/oaqps/greenbk/gntc.html (last visited Aug. 21, 2006).

79 U.S. Envtl. Prot. Agency, Green Book, *8-Hour Ozone County Map of Attainment and Nonattainment Areas in the U.S., available at* http://www.epa.gov/air/oaqps/greenbk/map8hrnm.html (last visited Aug. 27, 2006).

80 McCarthy, *supra* note 73, at *Summary*.

81 *Id*. at 5. In the 1990 CAA Amendments, Congress specified deadlines for areas to attain the ozone NAAQS, based upon the severity of their degree of nonattainment. 42 U.S.C. § 7511(a). According to the law, areas were to be classified according to severity upon their designation as "nonattainment," and deadlines were set for the appropriate number (ranging from 3-20) of years after November 15, 1990. *Id*., at Table 1. EPA applied those terms to categorize the 8-hour areas that were also in nonattainment of the 1-hour standard, with deadlines stretching from 3 years to 17 years after designation. *See* McCarthy, *supra* note 73, at 5; *See also* U.S. Envtl. Prot. Agency, *8-hour Ozone National Ambient Air Quality Standards: Final Rules*, 69 Fed. Reg. 23858, 23862-63 (Apr. 30, 2004) (to be codified at 40 C.F.R. § 51.903). "Over the years, those that fail to attain the standard by their deadline will be bumped up to the next category with an extension of their deadline. *Thus, ultimately, all these areas can be given until 2021 to reach attainment.*" McCarthy, *supra* note 73, at 5 (emphasis added); *See also* U.S. Envtl. Prot. Agency, *8-hour Ozone National Ambient Air Quality Standards: Final Rules*, 69 Fed. Reg. 23858, 23864 (Apr. 30, 2004) (" . . . EPA will consider bumping up areas subject to the five percent provision on our own initiative where there is evidence that an area is unlikely to attain within the period allowed by their classification.").

82 GAO, Attainment of Epa's Ozone Standard (1987 Testimony), *supra* note 12, at 18.

83 United States Census Bureau, American Factfinder, *available at* http://factfinder.census.gov/home/saff/main.html?_lang=en. Data for specific counties may be obtained by accessing http://factfinder.census.gov/servlet/AdvGeoSearchByListServlet?_lang=en&_command=getPlacenames (select the appropriate year and geography, then select the state and county of interest).

84 Counties designated in whole or in part as failing to attain EPA's 8-hour standard are identified in EPA's Green Book. U.S. Envtl. Prot. Agency, Green Book: 8-hour Ozone Nonattainment Areas, *available at* http://www.epa.gov/air/oaqps/greenbk/o8index.html (last visited Sept. 1, 2006).

85 American Lung Association, State of the Air 2006, *available at* http://lungaction.org/reports/stateoftheair2006.html (select state of interest, then click "Groups at Risk" tab to obtain data, view notes) (last visited Aug. 17, 2006).

86 "Pediatric asthma estimates are for those under 18 years of age and represent the estimated number of people who had asthma in 2003 based on national rates (NHIS) applied to county population estimates (US Census)." *Id*.

87 "Adult asthma estimates are for those 18 years and older and represent the estimated number of people who had asthma during 2003 based on state rates (BRFSS) applied to county population estimates (US Census)." *Id*.

88 "Chronic bronchitis estimates are for adults 18 and over who had been diagnosed with this disease within 2003 based on national rates (NHIS) applied to county population estimates (US Census). Emphysema estimates are for adults 18 and over who have been diagnosed with this disease within their lifetime based on national rates (NHIS) applied to county population estimates (US Census)." *Id*.

89 *Id*.

90 American Lung Association, State of the Air 2006, Introduction, *available at* http://lungaction.org/reports/sota06intro.html (last visited Aug. 17, 2006).

91 Emissions of VOCs by facility *available at* http://www.scorecard.org/env-releases/cap/rank-facilities.tcl?pollutant=voc&fips_state_code=Entire%20United%20States&how_many=100 (last visited Aug. 23, 2006) (select state of interest from drop-down menu).

92 Scorecard.org, *Scorecard's Source of Criteria Air Pollutant Emissions Data, available at* http://www.scorecard.org/env-releases/def/cap_net.html (last visited Aug. 23, 2006).

93 *See* California Air Resources Board, ARB Permits, Certifications, Exemptions and Registrations, *available at* http://www.arb.ca.gov/permits/permits.htm (last visited Sept. 7, 2006).

94 *See* Illinois Environmental Protection Agency, Illinois EPA Organization, Bureau of AiR, *available at* http://www.epa.state.il.us/about/org/bureau-of-air.html (last visited Sept. 7, 2006).

95 *See* New Jersey Department of Environmental Protection, Air Quality Permitting Program, *available at* http://www.nj.gov/dep/aqpp/ (last visited Sept. 7, 2006).

96 *See* New Jersey Department of Environmental Protection, Air Compliance and Enforcement, *available at* http://www.nj.gov/dep/enforcement/air.html (last visited Sept. 7, 2006).

97 Facilities that "cap-by-rule" limit their emissions below a level set forth in NYSDEC Regulations § 201-7.3(e). This regulation lists maximum allowable yearly emissions 50 percent below the Title V major source thresholds. Compliance with the emissions limits set forth in this regulation enables stationary sources to avoid the permit applications and federally enforceable emissions caps that come with designation as a synthetic minor source. In essence, a stationary source with the potential to emit above the Title V major source threshold can either apply for and accept federally enforceable limits just below the threshold, or voluntarily emit well below that threshold and be subject only to state permitting and enforcement.

98 *See* Michigan Department of Environmental Quality, Protecting Michigan's Air, *available at* http://www.michigan.gov/deq/0,1607,7-135-3310---,00.html (last visited Sept. 7, 2006).

99 *See* Ohio Environmental Protection Agency, Division of Air Pollution Control, Vision, Mission & Goals, *available at* http://www.epa.state.oh.us/dapc/general/goals.html (last visited Sept. 7, 2006).

100 *See* Texas Commission on Environmental Quality, Office of Permitting, Remediation and Registration, Air Permits Division, *available a*t http://www.tceq.state.tx.us/about/organization/oprr.html#1 (last visited Sept. 7, 2006).

101 *See* Texas Commission on Environmental Quality, Office of Compliance and Enforcement, *available at* http://www.tceq.state.tx.us/about/organization/oce.html (last visited Sept. 7, 2006).

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