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Ozone Air Quality Standards: EPA's March 2008 Revision

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April 18, 2008

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Summary

EPA Administrator Stephen Johnson signed final changes to the National Ambient Air Quality Standard (NAAQS) for ozone on March 12, 2008; the proposal appeared in the *Federal Register* on March 27. NAAQS are standards for outdoor (ambient) air that are intended to protect public health and welfare from harmful concentrations of pollution. By changing the standard, EPA has concluded that protecting public health and welfare requires lower concentrations of ozone pollution than it previously judged to be safe. This report discusses the standard-setting process, the specifics of the new standard, and issues raised by the Administrator's choice, and it describes the steps that will follow EPA's promulgation.

The ozone standard affects a large percentage of the population: nearly half the U.S. population currently lives in ozone "nonattainment" areas (the term EPA uses for areas that violate the standard), 140 million people in all. As a result of the standard's strengthening, more areas will be affected, and those already considered nonattainment may have to impose more stringent emission controls.

The revision lowers the primary (health-based) and secondary (welfare-based) standards from 0.08 parts per million (ppm) averaged over 8 hours to 0.075 ppm averaged over the same time. Using the most recent three years of monitoring data, 345 counties (54% of all counties with ozone monitors) would violate the new standards. Only 85 counties exceeded the pre-existing standards. Thus, the change in standards will have widespread impacts in areas across the country. (The 345 counties that would exceed the standard are shown in **Figure 2** of this report.)

The revision follows a multi-year review of the science regarding ozone's effects on public health and welfare. The new standards will set in motion a long and complicated implementation process that has far-reaching impacts for public health, for sources of pollution in numerous economic sectors, and for state and local governments. The first step, designation of nonattainment areas is expected to take place in 2010, with the areas so designated then having 3 to 20 years to reach attainment.

The new standards raise a number of issues, including whether the choices for the primary and secondary standards are backed by the available science. Not only are the Administrator's choices weaker than those proposed by his scientific advisers, but the administrative record makes clear that, in part, they were dictated by the White House over the objections of EPA. Whether the standards should lead to stronger federal controls on the sources of pollution is another likely issue. Current federal standards for cars, trucks, power plants, and other pollution sources are not strong enough to bring all areas into attainment, thus requiring local pollution control measures in many cases. EPA, the states, and Congress may also wish to consider whether the current monitoring network is adequate to detect violations of a more stringent standard. Only 639 of the nation's 3,000 counties have ozone monitors in place. With half of those monitors showing violations of the new standards, questions arise as to air quality in unmonitored counties.

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Ozone Air Quality Standards: EPA's March 2008 Revision

Introduction

On March 12, 2008, the EPA Administrator signed revisions to the National Ambient Air Quality Standards (NAAQS) for ozone. The revisions appeared in the March 27, 2008 issue of the *Federal Register*.[1] Because they have widespread implications for public health and for the pollution control measures that will be imposed on sectors of the economy, the revisions (released in proposed form in June 2007) have stirred congressional interest and led many Members of Congress and state and local officials to comment on the Administrator's proposal. The Clean Air and Nuclear Safety subcommittee of the Senate Environment and Public Works Committee held a hearing on the proposal July 11, 2007. The House Oversight and Government Reform Committee plans a hearing April 24, 2008.

This report provides background on NAAQS, the process used to establish them, the pre-existing ozone standard, and EPA's revisions, as well as information regarding the revisions' potential effects.

What Are NAAQS?

As defined in Section 109 of the Clean Air Act, NAAQS are standards that apply to ambient (outdoor) air. The act directs EPA to set both primary and secondary standards. Primary NAAQS are standards, "the attainment and maintenance of which in the judgment of the [EPA] Administrator ... are requisite to protect the public health," with "an adequate margin of safety." Secondary NAAQS are standards necessary to protect public welfare, a broad term that includes damage to crops, vegetation, property, building materials, etc.[2]

NAAQS are at the core of the Clean Air Act, even though they do not directly regulate emissions. In essence, they are standards that define what EPA considers to be clean air. Once a NAAQS has been set, the agency, using monitoring data and other information submitted by the states, identifies areas that exceed the standard and must, therefore, reduce pollutant concentrations to achieve it. After these "nonattainment" areas are identified, state and local governments have three years to produce State Implementation Plans which outline the measures they will implement to reduce the pollution levels and attain the standards. Depending on the severity of

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[1] 73 *Federal Register* 16436.

[2] The Clean Air Act's definition of welfare is found in Section 302(h) of the act.

the pollution, ozone nonattainment areas have anywhere from 3 to 20 years to actually attain the standard.

EPA also acts to control many of the NAAQS pollutants wherever they are emitted, through national standards for products that emit them (particularly mobile sources, such as automobiles) and emission standards for new stationary sources, such as power plants. Thus, establishment or revision of a NAAQS sets in motion a long and complicated implementation process that has far-reaching impacts for public health, for sources of pollution in numerous economic sectors, and for states and local governments.

The pollutants to which NAAQS apply are generally referred to as "criteria" pollutants. The act defines them as pollutants that "endanger public health or welfare," and whose presence in ambient air "results from numerous or diverse mobile or stationary sources."[3] Six pollutants are currently identified as criteria pollutants: ozone, particulates, carbon monoxide, sulfur dioxide, nitrogen oxides, and lead. The EPA Administrator can add to this list if he determines that additional pollutants meet the act's criteria, or delete them if he concludes that they no longer do so.

The act requires the agency to review each NAAQS every five years. That schedule is rarely met, but it often triggers lawsuits that force the agency to undertake a review. In the case of ozone, the previous review of the NAAQS was completed in 1997. The American Lung Association filed suit over EPA's failure to complete a review in 2003, and a consent decree established the schedule EPA ultimately followed.[4]

The NAAQS Process

Reviewing an existing NAAQS is a long process that is described elsewhere in more detail.[5] To summarize briefly, EPA scientists review the scientific literature published since the last NAAQS revision, and summarize it in a report known as a Criteria Document. The review process for ozone identified 1,700 scientific studies on topics as wide-ranging as the physics and chemistry of ozone in the atmosphere; environmental concentrations, patterns, and exposure; dosimetry and animal-to-

[3] Authority to establish NAAQS comes from both Sections 108 and 109 of the act; this definition of criteria pollutants is found in Section 108. The authority and procedures for controlling the sources of criteria pollutants are found throughout Titles I, II, and IV of the act. Pollutants that are less widely emitted are generally classified as "hazardous air pollutants" and are regulated under a different section of the act (Section 112).

[4] The schedule was set by a consent decree that settled a lawsuit filed by the American Lung Association (American Lung Association v. Leavitt, D.D.C., No. 03-778, modified consent decree approved 12/16/04). EPA agreed that it would propose whether to retain or revise the ozone standard by June 20, 2007, and take final action by March 12, 2008.

[5] For a discussion of the process, and of changes to it that EPA is now implementing, see CRS Report RL33807, *Air Quality Standards and Sound Science: What Role for CASAC?*, by James E. McCarthy.

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human extrapolation; toxicology; interactions with co-occurring pollutants; controlled human exposure studies; epidemiology; effects on vegetation and ecosystems; effects on UVB exposures and climate; and effects on man-made materials. A second document that EPA prepares, the Staff Paper, summarizes the information compiled in the Criteria Document and provides the Administrator with options regarding the indicators, averaging times, statistical form, and numerical level (concentration) of the NAAQS.

To ensure that these reviews meet the highest scientific standards, the 1977 amendments to the Clean Air Act required the Administrator to appoint an independent Clean Air Scientific Advisory Committee (CASAC). CASAC has seven members, largely from academia and from private research institutions. In conducting NAAQS reviews, their expertise is supplemented by panels of the nation's leading experts on the health and environmental effects of the specific pollutants that are under review. These panels can be quite large. The ozone review panel, for example, had 23 members. CASAC and the public make suggestions regarding the membership of the panels on specific pollutants, with the final selections made by EPA. The panels review the agency's work during NAAQS-setting and NAAQS-revision, rather than conducting their own independent reviews.

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The Ozone Standard

The ozone standard affects a larger percentage of the population than any of the other NAAQS. Nearly half the U.S. population currently lives in ozone nonattainment areas, 140 million people in all.[6] Since the standard has been strengthened as a result of the current review, more areas will be affected, and those already considered nonattainment may have to impose more stringent emission controls.

The Primary Standard

The pre-existing primary (health-based) standard, promulgated in 1997, was set at 0.08 parts per million (ppm), averaged over an 8-hour period. Allowing for rounding, EPA considered areas with readings as high as 0.084 ppm (84 parts per billion) to have attained the standard.

The review just completed found evidence of health effects, including mortality, at levels of exposure below the 0.08 ppm standard. As a result, both EPA staff and the Clean Air Scientific Advisory Committee (CASAC) recommended strengthening the standard. According to CASAC, "There is no scientific justification for retaining

[6] For information on the nonattainment areas, including maps and population data, see EPA's "Green Book" at [http://www.epa.gov/oar/oaqps/greenbk/index.html].

the current [0.08 ppm] primary 8-hr NAAQS...."[7] The panel unanimously recommended a range of 0.060 to 0.070 ppm for the primary 8-hour standard.

EPA staff also recommended strengthening the standard, in wording not quite so direct. The staff stated, "The overall body of evidence on ozone health effects clearly calls into question the adequacy of the current standard." They recommended "considering a standard level within the range of somewhat below 0.080 parts per million (ppm) to 0.060 ppm."[8]

Based on these recommendations, and his own judgment regarding the strength of the science, the Administrator proposed to tighten the primary standard to a level within the range of 0.070-0.075 ppm in June 2007, and ultimately chose to finalize the standard at 0.075 ppm (75 parts per billion).[9] The revision will add a large number of counties to those showing nonattainment. As shown in **Figure 1**, using 2004-2006 data (the latest available), 85 counties had monitors showing violation of the 0.08 ppm primary standard. **Figure 2** shows what happens when the standard is strengthened to 0.075 ppm, again using 2004-2006 data: under the new standard, 345 counties, more than four times as many, show violations.

EPA notes that nonattainment designations will not actually be made until 2010 at the earliest, and will use data for the period 2006-2008. Given the trend toward cleaner air in recent years, and regulations on both mobile and stationary sources that will be taking effect in the next few years, the agency expects the number of counties exceeding the standard to be less than indicated by these projections. Nevertheless, because a strengthening of the standard will result in some (perhaps a substantial number of) additional areas being designated nonattainment, and will mean that current nonattainment areas may have to adopt additional pollution control measures in order to reach attainment, numerous industry groups are reported to have challenged the scientific conclusions in meetings with Administration officials.[10]

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[7] Letter of Rogene Henderson, Chair, Clean Air Scientific Advisory Committee, to Hon. Stephen L. Johnson, EPA Administrator, October 24, 2006, available at [http://yosemite.epa.gov/sab/sabproduct.nsf/AB290E0DB8B72A33852572120055858F/$File/casac-07-001.pdf].

[8] "Review of National Ambient Air Quality Standards for Ozone Final Staff Paper, Human Exposure and Risk Assessments and Environmental Report," Fact Sheet, at [http://www.epa.gov/ttn/naaqs/standards/ozone/data/2007_01_finalsp_factsheet.pdf].

[9] All of EPA's references to the standard are expressed as parts per million (e.g., 0.075 ppm), but many references in the press convert this to a more readable parts per billion (i.e., 75 parts per billion). In order to avoid confusion when quoting from EPA sources, this report generally uses the more cumbersome parts-per-million form.

[10] "EPA Target of Intensive Lobbying Over Forthcoming Ozone Decision," *Daily Environment Report*, March 10, 2008, p. A-3, and "Energy Industry Presents Case to Preserve Existing Air Quality Standard for Ozone," *Daily Environment Report*, February 6, 2008, p. A-9.

Figure 1. Counties with Monitors Violating the 1997 Eight-Hour Ozone Standard (0.08 parts per million)

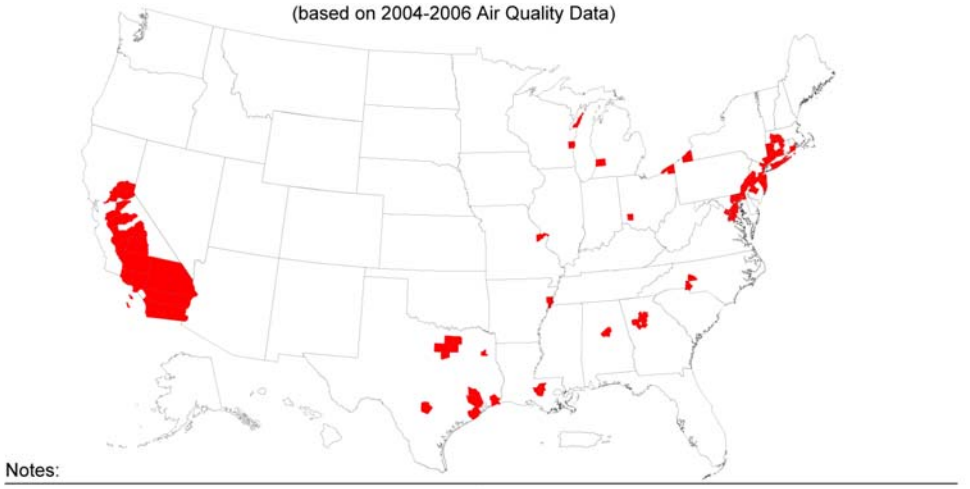
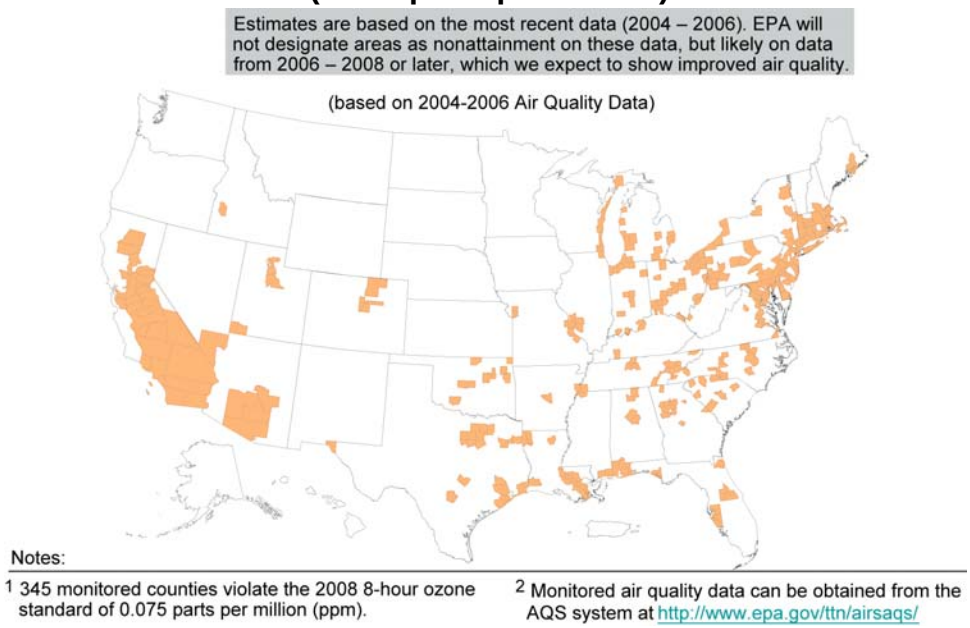


Figure 2. Counties with Monitors Violating the New Eight-Hour Ozone Standard (0.075 parts per million)



Source: U.S. EPA.

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The Secondary Standard

As part of its recent review, EPA also assessed the secondary (public welfare) NAAQS for ozone, which was identical to the previous 0.08 ppm primary standard. Ozone affects both tree growth and crop yields, and the damage from exposure is cumulative over the growing season. In order to provide protection against ozone's adverse impacts, EPA staff recommended a new seasonal (3-month) average for the secondary standard that would cumulate hourly ozone exposures for the daily 12-hour daylight window (termed a "W126 index"). The staff recommended a standard in a range of 7 - 21 parts per million-hours (ppm-hrs). CASAC's ozone panel agreed unanimously that the form of the secondary standard should be changed as the staff suggested, but it did not agree that the upper bound of the range should be as high as 21 ppm-hours.[11] The Administrator's June 2007 proposal was in line with the staff recommendation, 7-21 ppm-hrs, but his final March 2008 choice was to duplicate the new primary standard. He set a secondary standard at 0.075 ppm averaged over 8 hours, rejecting the advice of both CASAC and his staff.

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The secondary standard carries no deadline for attainment and has never been the subject of penalties or sanctions for areas that failed to meet it (unless they also violated a primary standard). Nevertheless, there appears to have been substantial disagreement between EPA and the White House over the form in which this standard should be set. The preamble to the final regulation repeats the arguments for a new form of standard (the W126 index), concluding:

> The CASAC, based on its assessment of the same vegetation effects science, agreed with the Criteria Document and Staff Paper and unanimously concluded that protection of vegetation from the known or anticipated adverse effects of ambient O3 [ozone] "requires a secondary standard that is substantially different from the primary standard in averaging time, level, and form," i.e. not identical to the primary standard for O3 (Henderson, 2007).[12]

The preamble also cites comments the agency received from the National Park Service that "... the NPS supports both the conclusion that a seasonal, cumulative metric is needed to protect vegetation, and that the W126 is a more appropriate metric ...," and it adds "EPA agrees with these comments."[13]

Nevertheless, the agency appears to have lost this argument. The preamble states that:

> On March 11, 2008, the President "concluded that, consistent with Administration policy, added protection should be afforded to public welfare by strengthening the secondary ozone standard and setting it to be identical to the

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[11] Letter of Rogene Henderson, Chair, Clean Air Scientific Advisory Committee, to Hon. Stephen L. Johnson, EPA Administrator, March 26, 2007, p. 3, available at [http://yosemite.epa.gov/sab/sabproduct.nsf/FE915E916333D776852572AC007397B5/$File/casac-07-002.pdf].

[12] 73 *Federal Register* 16498.

[13] Ibid., p. 16499.

> new primary standard, the approach adopted when ozone standards were last promulgated. This policy thus recognizes the Administrator's judgment that the secondary standard needs to be adjusted to provide increased protection to public welfare and avoids setting a standard lower or higher than is necessary."[14]

The statement that the policy "recognizes the Administrator's judgment" is not EPA's wording. It is a direct quotation from the White House Office of Management and Budget.[15]

Controlling Ozone Pollution

Controlling ozone pollution is more complicated than controlling many other pollutants, because ozone is not emitted directly by pollution sources. Rather, it forms in the atmosphere when volatile organic compounds (VOCs) react with nitrogen oxides (NOx) in the presence of sunlight. The ozone concentration is as dependent on the temperature and amount of sunshine as it is on the presence of the precursor gases. Ozone is a summertime pollutant, in general. Other factors being equal, a cool, cloudy summer will produce fewer high ozone readings than a warm, sunny summer.

There are also complicated reactions that affect ozone formation. In general, lower emissions lead to less ozone, particularly lower emissions of VOCs. But under some conditions, *higher* emissions of NOx lead to lower ozone readings. This makes modeling ozone air quality and predicting attainment more difficult and contentious than the modeling of other air pollutants.

Most stationary and mobile sources are considered to be contributors to ozone pollution. Thus, there are literally hundreds of millions of sources of the pollutants of concern and control strategies require implementation of a wide array of measures. Among the sources of VOCs are motor vehicles (about 40% of total emissions), industrial processes, particularly the chemical and petroleum industries, and any use of paints, coatings, and solvents (about 40% for these sources combined). Service stations, pesticide application, dry cleaning, fuel combustion, and open burning are other significant sources of VOCs. Nitrogen oxides come overwhelmingly from motor vehicles and fuel combustion by electric utilities and other industrial sources.

Costs and Benefits of Control

EPA is prohibited from taking cost into account in setting NAAQS, but to comply with an executive order, the agency generally produces a Regulatory Impact

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[14] Ibid., p. 16497.

[15] Letter from Susan E. Dudley, Administrator, Office of Management and Budget, to Stephen L. Johnson, Administrator, U.S. EPA, March 13, 2008, at [http://www.regulations.gov/fdmspublic/component/main?main=DocketDetail&d=EPA-HQ-OAR-2005-0172], item 7178. Note: the date on the letter is apparently incorrect, as the letter was received March 12, 2008.

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Analysis (RIA) analyzing in detail the costs and benefits of new or revised NAAQS standards. The agency released an RIA for the final standards on March 14; the major conclusions regarding benefits and costs were also included in text slides dated March 12 that were posted on the agency's website.[16] The RIA shows a wide range of estimates for benefits, from a low of $2 billion annually to a high of $19 billion annually in 2020. Costs of implementing the standard were estimated to range from $7.6 billion to $8.8 billion annually, also in 2020. The benefit range is so wide that it is difficult to reach any general conclusions regarding whether projected benefits exceed costs or vice versa.

The public health benefits of setting a more stringent ozone standard are the monetized value of such effects as fewer premature deaths, fewer hospital admissions, fewer emergency room visits, fewer asthma attacks, less time lost at work and school, and fewer restricted activity days.[17] An EPA Fact Sheet that accompanied the standards states that the benefits of an 0.075 ppm primary standard might include the avoidance of 260 to 2,300 premature deaths annually in 2020.[18] Other annual benefits in 2020 would include preventing the following:

- 380 cases of chronic bronchitis
- 890 nonfatal heart attacks
- 1,900 hospital and emergency room visits
- 1,000 cases of acute bronchitis
- 11,600 cases of upper and lower respiratory symptoms
- 6,100 cases of aggravated asthma
- 243,000 days when people miss work or school
- 750,000 days when people must restrict their activities.

In the RIA, the agency notes that, "There are significant uncertainties in both cost and benefit estimates."[19] Among the uncertainties are unquantified benefits (the effects of reduced ozone on forest health and agricultural productivity, for example) and unquantified disbenefits (reduced screening of UVB radiation and reduced nitrogen fertilization of forests and cropland). The benefits will also vary, depending on which of the precursor pollutants nonattainment areas choose to control.

The RIA also states, "Of critical importance to understanding these estimates of future costs and benefits is that they [are] not intended to be forecasts of the actual costs and benefits of implementing revised standards."[20] If past experience is any guide, this is likely to mean that costs will not be as great as they are projected to be.

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[16] The RIA is at [http://www.epa.gov/ttn/ecas/ria.html]. The text slides are at [http://www.epa.gov/groundlevelozone/pdfs/2008_03_text_slides.pdf].

[17] For a full discussion of these variables and their monetized values, see Chapter 6 of the RIA at [http://www.epa.gov/ttn/ecas/regdata/RIAs/6-ozoneriachapter6.pdf].

[18] "Final Revisions to the National Ambient Air Quality Standards for Ozone," Fact Sheet, at [http://www.epa.gov/groundlevelozone/pdfs/2008_03_factsheet.pdf], pp. 2-3.

[19] RIA Executive Summary, p. ES-9, at [http://www.epa.gov/ttn/ecas/regdata/RIAs/0-ozoneriaexecsum.pdf].

[20] Ibid.

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In the agency's words, "Technological advances over time will tend to increase the economic feasibility of reducing emissions, and will tend to reduce the costs of reducing emissions."[21] Benefits, meanwhile, will remain difficult to quantify, in part because of the difficulty of quantifying and valuing lives lost prematurely due to exposure to pollution.

Issues

The major issues raised by the new standards concern whether the Administrator has made appropriate choices, i.e., whether his choices for the primary and secondary standards are backed by the scientific studies. The Administrator's choice for the primary standard is weaker than any part of the range proposed by CASAC. The secondary standard does not follow the form that CASAC unanimously recommended.

In explaining the Administrator's choice for the primary standard, the preamble stresses the uncertainty that the Administrator found at lower levels of ozone exposure:

> The Administrator noted that at exposure levels below 0.080 ppm there is only a very limited amount of evidence from clinical studies, indicating effects in some healthy individuals at levels as low as 0.060 ppm. The great majority of the evidence concerning effects below 0.080 ppm is from epidemiological studies. The epidemiological studies do not identify any bright-line threshold level for effects. At the same time, the epidemiological studies are not in and of themselves direct evidence of a causal link between exposure to O_3 and the occurrence of the effects.[22]

Thus, he concluded that within his proposed range of 0.070 to 0.075 ppm, the choice was essentially a policy judgment.

> Taking into account the uncertainties that remain in interpreting the evidence from available controlled human exposure and epidemiological studies at very low levels, the Administrator notes that the likelihood of obtaining benefits to public health with a standard set below 0.075 ppm O3 decreases, while the likelihood of requiring reductions in ambient concentrations that go beyond those that are needed to protect public health increases. The Administrator judges that the appropriate balance to be drawn, based on the entire body of evidence and information available in this review, is a standard set at 0.075.[23]

CASAC, in a letter to the Administrator dated October 24, 2006, appeared to disagree with this conclusion. The letter states:

> Furthermore, we have evidence from recently reported controlled clinical studies of healthy adult human volunteers exposed for 6.6 hours to 0.08, 0.06, or 0.04

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[21] Ibid., p. ES-10.

[22] 73 *Federal Register* 16476, March 27, 2008.

[23] Ibid., p. 16483.

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> ppm ozone, or to filtered air alone during moderate exercise (Adams, 2006). Statistically-significant decrements in lung function were observed at the 0.08 ppm exposure level. Importantly, adverse lung function effects were also observed in some individuals at 0.06 ppm (Adams, 2006). These results indicate that the current ozone standard of 0.08 ppm is not sufficiently health-protective with an adequate margin of safety. It should be noted these findings were observed in healthy volunteers; similar studies in sensitive groups such as asthmatics have yet to be conducted. However, people with asthma, and particularly children, have been found to be more sensitive and to experience larger decrements in lung function in response to ozone exposures than would healthy volunteers.[24]

In past years, the Administrator has generally chosen standards within CASAC's ranges, but not always — a recent example being the NAAQS for particulate matter promulgated in October 2006. That standard is currently being challenged in the D.C. Circuit Court of Appeals.[25] It would not be surprising if the new ozone standard is also challenged.

In setting the secondary standard, as described earlier, the Administrator's choice also disregarded the advice of CASAC, and apparently EPA's staff as well. The preamble contains EPA statements both opposing and supporting the final form of the standard, and it appears to indicate substantial involvement by the White House Office of Management and Budget in the final days before promulgation.

Other issues will undoubtedly be raised as affected industries, state environmental agencies, public interest and environmental groups, and the Congress review what EPA has promulgated, including the potential impacts of the new standards on public health and on the economy. In looking at potential impacts, EPA projected air quality to the year 2020, incorporating the expected reductions in emissions from a slew of federal regulations, including the Clean Air Interstate Rule (CAIR), the Clean Air Visibility Rule, the Tier 2 auto and light truck emission standards, several rules affecting diesel engines, and some state and local measures. Even with these controls, the agency projected that 28 counties in 10 states (counties that include some of the nation's biggest cities) would violate the 0.075 standard in 2020.[26] Furthermore, most nonattainment areas will not be given until 2020 to attain the standards: for most, the deadline will be 2013 or 2016 (based on the degree to which pollutant concentrations exceed the new standard). This suggests a mismatch between the full impact of federal regulations on specific categories of emission sources and the requirement that local areas demonstrate attainment. This mismatch could support a case for stronger federal controls on the sources of ozone precursors or a reexamination of the attainment deadlines.

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[24] Letter of Dr. Rogene Henderson, Chair, CASAC, to EPA Administrator Stephen L. Johnson, October 24, 2006, at [http://yosemite.epa.gov/sab/sabproduct.nsf/AB290E0DB8B72A33852572120055858F/$File/casac-07-001.pdf], pp. 3-4.

[25] For additional information on the particulate NAAQS, see CRS Report RL33254, *Air Quality: EPA's 2006 Changes to the Particulate Matter (PM) Standard*, by Robert Esworthy and James E. McCarthy.

[26] For a map showing the 2020 projections, see EPA's briefing materials at [http://www.epa.gov/groundlevelozone/pdfs/20070621_maps.pdf].

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Another issue arises from a close inspection of EPA's maps: i.e., whether the current monitoring network is adequate to detect violations of a more stringent standard. Only 639 of the nation's 3,000 counties have ozone monitors in place. With 345 of them (54%) showing violations of the new standard, using current data, how confident is the agency that the 2,400 counties without monitors would all be in attainment? For the past three years, the President's budget has requested significant reductions in grants to states and local governments for air quality management, which includes funding for monitoring.[27] Given these reductions, increasing the number of monitors would appear to be a task that the agency views as falling on state and local government resources.

The current monitors are generally found in urban areas, because of the larger population potentially affected, and because most of the sources of ozone precursor emissions are located in such areas. But, as noted earlier, ozone is not emitted directly by polluters. It forms in the atmosphere downwind of emission sources. Thus, rural areas can have high ozone concentrations, unless they are located a substantial distance from any urban area. In addition to the potential health impacts of ozone in rural areas, the controversy over the setting of the secondary ozone NAAQS might suggest a need for additional monitoring in rural areas.

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[27] For additional information, see CRS Report RL34011, *Interior, Environment, and Related Agencies: FY2008 Appropriations*, coordinated by Carol Hardy Vincent.