



Final Revisions to the Ozone and Particulate Matter Air Quality Standards

*P*rotecting public health, the environment, and the quality of life from the detrimental effects of air pollution has been a strong national priority since 1970, when Congress passed the Clean Air Act. Under this authority, the U.S. Environmental Protection Agency (EPA) has established air quality standards—known as National Ambient Air Quality Standards—for six pollutants. Recently EPA completed its review of the current air quality standards for ground-level ozone (commonly known as smog) and particulate matter (or PM). Based on new scientific evidence, EPA has issued final revisions to strengthen both sets of standards. The revised standards will provide additional protection to nearly 125 million Americans, including 35 million children. EPA has also proposed a new program to control regional haze, which is largely caused by particulate matter.



What is an ambient air quality standard?

An ambient air quality standard is a national target for an acceptable concentration of a specific pollutant in air. Under the Clean Air Act, EPA develops two standards for each pollutant of concern:

- A **primary standard** to protect public health. The Clean Air Act mandates that primary standards be based entirely on health-related information, without considering the costs of attaining the standard.
- A **secondary standard** to protect public welfare. Public welfare includes effects on soils, water, crops, vegetation, buildings, property, animals, wildlife, weather, visibility, transportation, and other economic values, as well as personal comfort and well-being.

Why has EPA revised the ozone standards?

Ozone has clear, documented impacts on human health, crops, and ecosystems. EPA first promulgated ozone standards in 1971. These standards were last revised in 1979. EPA reviewed the scientific information for ozone in 1993, but based on studies published through the late 1980s, the Agency concluded that the current ozone standards were adequate to protect human health.

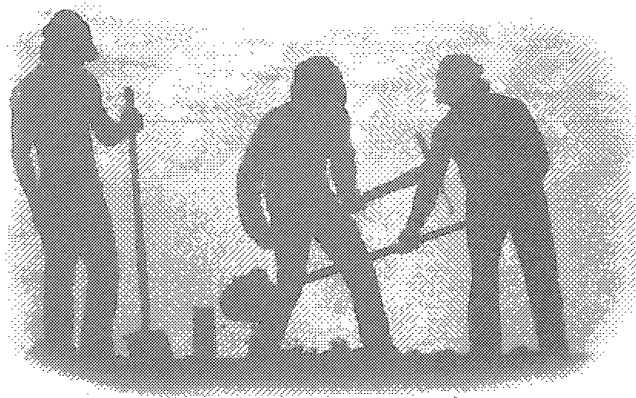
Since that time, however, over 3,000 new studies on ozone have been published. Many of these new studies show that ozone can cause adverse health effects at levels below the current primary standard. For this reason, EPA has revised the primary standard to provide a higher level of protection than the current standard.



What changes were made to the ozone standard?

EPA published revisions to the ozone standards in July 1997. The table on page 4 compares the current and revised standards. Highlights of the changes to the primary standard for ozone include:

- **A change in averaging time.** The new standard is based on averaging air quality measurements over 8-hour blocks of time, instead of the 1-hour blocks of time required by the current standard. Eight-hour averaging is more consistent with the health information that prompted EPA to propose revisions to the standard. Also, by averaging over 8 hours, the standard helps protect people who spend a significant amount of time working or playing outdoors—a group that is particularly vulnerable to the effects of ozone.
- **Strengthening the standard.** EPA has adopted an 8-hour standard with a level of 0.08 ppm to provide greater protection to public health than the current standard.



The new ozone standard would help protect people who spend a significant amount of time working or playing outdoors—a group that is particularly vulnerable to the effects of ozone.

About National Ambient Air Quality Standards

How is an air quality standard expressed?

To account for the fact that the concentration of a pollutant in air varies over time, an air quality standard is expressed as an average concentration over a specific time period (an hour, a day, or a year, for example). The concentration is expressed in parts per million (ppm)¹ or micrograms of pollutant per cubic meter of air ($\mu\text{g}/\text{m}^3$). (For example, the current primary standard for ozone is 0.12 ppm averaged over 1 hour.) The standard also specifies whether the limit applies to a

specific concentration (for example, the fourth-highest in a year) or a number of times the level can be exceeded during the calendar year.

Who is responsible for meeting air quality standards?

States are responsible for preparing and implementing "State Implementation Plans" to achieve and maintain the air quality standards within their borders. As part of these plans, states divide their total area into "Air Quality Control Regions." State and local air pollution control authorities then establish individual require-

ments for controlling air pollution within each region.

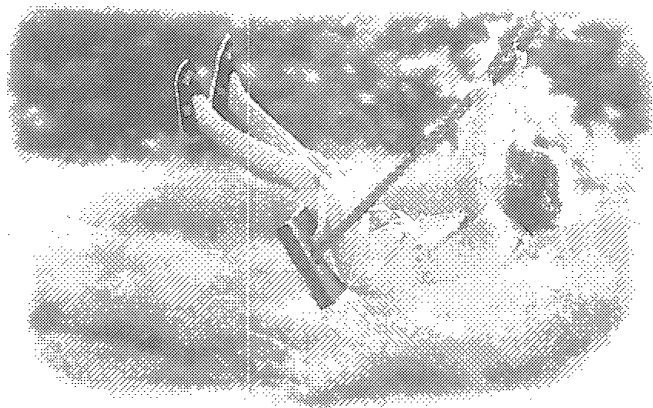
How does EPA ensure that State Implementation Plans are successful?

State Implementation Plans must be approved by EPA. Under these plans, state and local authorities monitor the air quality in each control region. If the air quality in a region falls below any of the air quality standards, EPA designates that region as a "nonattainment area." The area is then required to develop and implement plans to improve its air quality.

¹ One drop of water in a full bathtub is analogous to one part per million.

Why has EPA revised the particulate matter standards?

The particulate matter standards were last revised in 1987. Since that time, many important new studies have been published which show that breathing particulate matter at concentrations allowed by the current primary standard can likely cause significant health effects—including premature death and an increase in respiratory illness. Also, EPA believes that the current secondary standard does not adequately protect visibility (our ability to clearly perceive distance, color, contrast, and detail).



EPA estimates that the new particulate matter standards, along with clean air programs already planned, will reduce premature deaths by about 15,000 a year and serious respiratory problems in children by about 250,000 cases a year.

What changes were made to the particulate matter standards?

EPA published final revisions to the particulate matter standards in July, 1997. The table on page 4 compares the current and revised standards.

The current standards apply to particles up to 10 microns in diameter. (One thousand particles of this size could fit into the period at the end of this sentence.) A review of the scientific data indicate, however, that it is the smaller (or fine) particles—less than 2.5 microns in diameter—that are

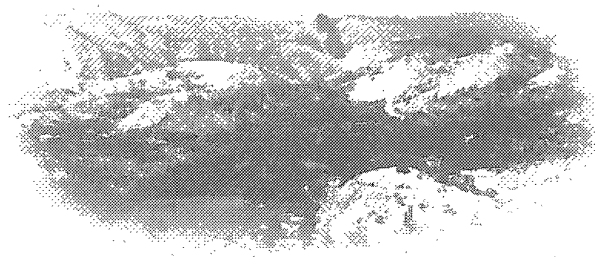
largely responsible for the health effects of greatest concern and for visibility impairment (for example, obscuring scenic views).

Based on this information, EPA has issued final revisions to strengthen the particulate matter standards by keeping the current 10-micron standards and adding new standards that provide more stringent goals for fine particles in air. EPA estimates that the new standards, along with clean air programs already planned, will reduce premature deaths by about 15,000 a year and serious respiratory problems in children by about 250,000 cases a year.

What is EPA's new regional haze program?

Fine particles in air not only can impact human health but, because they scatter and absorb light effectively, also can affect the quality of life by impairing visibility. Impaired visibility in all directions over a large area is called "regional haze."

EPA proposed a new program to control regional haze in July 1997. This program will help achieve a national visibility goal that Congress established when it amended the Clean Air Act in 1977. This goal calls for improving current visibility and preventing future visibility problems due to pollution in several national parks and wilderness areas. EPA is soliciting comments on the proposed regional haze program and expects to finalize it in 1998.



How can I learn more about National Ambient Air Quality Standards?

More information about ozone and particulate matter and related programs can be found on the Internet at EPA's Office of Air Quality Planning and Standards home page: <http://www.epa.gov/oar/oaqps/>

Current and Revised Standards for Ozone and Particulate Matter

Pollutant	Current Primary Standard ^a		Revised Primary Standard ^a	
Ozone	1-Hour 0.12 ppm	To attain this standard, the daily maximum 1-hour average concentration measured by a continuous ambient air monitor must not exceed 0.12 ppm more than once per year, averaged over 3 consecutive years.	8-Hour 0.08 ppm	To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average of continuous ambient air monitoring data ^b over each year must not exceed 0.08 ppm.
Particulate Matter Up to 10 Microns in Diameter (PM ₁₀)	Annual 50 µg/m ³	To attain this standard, the arithmetic average of the 24-hour samples for a period of 1 year, averaged over 3 consecutive years, must not exceed 50 µg/m ³ .	Annual 50 µg/m ³	Same as existing standard for PM ₁₀ .
	24-hour 150 µg/m ³	To attain this standard, the concentration of samples taken for 24-hour periods at each monitor within an area must not exceed 150 µg/m ³ , more than once per year, averaged over 3 years.	24-hour 150 µg/m ³	To attain this standard, the 99th percentile ^c of the distribution of the 24-hour concentrations for a period of 1 year, averaged over 3 years, must not exceed 150 µg/m ³ at each monitor within an area.
Particulate Matter Up to 2.5 Microns in Diameter (PM _{2.5})	No current standard.		Annual 15 µg/m ³	To attain this standard, the 3-year average of the annual arithmetic mean of the 24-hour concentrations from single or multiple population-oriented monitors ^d must not exceed 15.0 µg/m ³ .
	No current standard.		24-hour 65 µg/m ³	To attain this standard, the 98th percentile of the distribution of the 24-hour concentrations for a period of 1 year, averaged over 3 years, must not exceed 65 µg/m ³ at each monitor within an area.

^a The current and revised secondary standards for ozone and particulate matter are the same as the primary standards described here.

^b The new approach of focusing on actual monitored concentrations rather than the number of days on which the standard is exceeded (regardless of the magnitude of the exceedance) better accounts for the effects on public health.

^c The revised 24-hour PM₁₀ standard is very similar to the current standard. However, by using the 99th percentile concentration approach, the revised standard better accounts for the effects on public health and inherently com-

pensates for missing data. In this way, it reduces or eliminates the need for complex procedures that now are needed to adjust for missing samples. Thus, the revised approach for the 24-hour PM₁₀ standard simplifies the data handling requirements.

^d The focus on population-oriented monitors stems from the health information that formed the basis for the annual PM_{2.5} standard. This information relates area-wide health statistics to area-wide air quality as measured by one or more monitors.

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