

**FACT SHEET**  
**PROPOSED REVISIONS TO THE NATIONAL AMBIENT AIR QUALITY**  
**STANDARDS FOR SULFUR DIOXIDE**

**SUMMARY OF ACTION**

- On November 16, 2009, EPA proposed to strengthen the National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO<sub>2</sub>). The proposed changes would improve public health protection. People with asthma, children and the elderly are especially susceptible to the health problems associated with breathing SO<sub>2</sub>.
- EPA is proposing to revise the primary SO<sub>2</sub> standard, designed to protect public health, to a level of between 50 and 100 parts per billion (ppb) measured over 1-hour. The existing primary standards were 140 ppb measured over 24-hours, and 30 ppb measured over an entire year. The Agency also is taking comment on alternative levels for the 1-hour standard up to 150 ppb.
- Evaluation of the scientific information and the risks posed by breathing SO<sub>2</sub> indicate that a 1-hour standard would better protect public health by reducing people's exposure to high short-term (five minutes to 24 hours) concentrations of SO<sub>2</sub>.
- EPA estimates that the revised standards would yield health benefits valued between \$16 billion and \$100 billion. Those benefits would include reduced hospital admissions, emergency room visits, work days lost, cases of aggravated asthma and chronic bronchitis, among others.
- EPA anticipates that a new 1-hour standard in the proposed range would continue to prevent SO<sub>2</sub> concentrations from exceeding the current 24-hour and annual health-based standards. EPA also recognizes that there is little health evidence to suggest an association between long-term exposure to SO<sub>2</sub> and public health effects. Therefore, EPA is proposing to revoke both the current primary SO<sub>2</sub> standards.
- The proposal also includes a new "form" for the SO<sub>2</sub> standard. The form is the air quality statistic that is compared to the level of the standard to determine if an area meets the standard.
- EPA is also proposing changes to the ambient air monitoring and reporting requirements for SO<sub>2</sub>. These proposed requirements are expected to result in a minimum of 348 SO<sub>2</sub> monitoring sites. EPA estimates that at least one-third of the SO<sub>2</sub> monitors already in operation may meet the proposed siting requirements.

- State, local, and tribal air monitoring agencies, under this proposal, would report both the 1-hour and maximum five minute averaged SO<sub>2</sub> data available in each hour of the day. This means that two SO<sub>2</sub> concentration values would be reported for each hour.
- As part of this notice, EPA is also proposing an approach for implementing the proposed 1-hour SO<sub>2</sub> standard.
- The proposal also would change the Air Quality Index to reflect the revised SO<sub>2</sub> standards.
- EPA will accept comments for 60 days after the proposed rule is published in the Federal Register. The Agency will hold a public hearing on the proposed rule January 5, 2010 in Atlanta. EPA will issue a final rule by June 2, 2010.
- The proposed changes would not affect the secondary SO<sub>2</sub> NAAQS, set to protect public welfare. EPA is considering the need for changes to the secondary standard under a separate review.

## **SO<sub>2</sub> AND PUBLIC HEALTH**

- Current scientific evidence links short-term exposure to SO<sub>2</sub>, ranging from five minutes to 24 hours, with a range of adverse respiratory effects including narrowing of the airways that can cause difficulty breathing (bronchoconstriction) and increased asthma symptoms. These effects are particularly important for asthmatics at elevated ventilation rates (e.g., while exercising or playing.)
- Studies also show an association between short-term SO<sub>2</sub> exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.
- EPA's National Ambient Air Quality Standard for SO<sub>2</sub> is designed to protect against exposure to the entire group of sulfur oxides (SO<sub>x</sub>). SO<sub>2</sub> is the component of greatest concern and is used as the indicator for the larger group of gaseous sulfur oxides. Other gaseous sulfur oxides (e.g., SO<sub>3</sub>) are found in the atmosphere at concentrations much lower than SO<sub>2</sub>.
- Emissions that lead to high concentrations of SO<sub>2</sub> generally also lead to the formation of other SO<sub>x</sub>. Control measures that reduce SO<sub>2</sub> can generally be expected to reduce people's exposures to all gaseous SO<sub>x</sub>. Reducing SO<sub>2</sub> emissions are expected to have the important co-benefit of reducing the formation of fine sulfate particles, which pose significant public health threats.
- SO<sub>x</sub> can react with other compounds in the atmosphere to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can

cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. EPA's NAAQS for particulate matter are designed to provide protection against these health effects.

## **IMPLEMENTING THE PROPOSED SO<sub>2</sub> STANDARDS**

- EPA is also outlining the Clean Air Act requirements that states and tribes must address to implement a new or revised SO<sub>2</sub> air quality standard.
- The Agency is proposing a schedule for implementing the proposed new standard.
- EPA will sign the final primary national air quality standard for SO<sub>2</sub> by June 2, 2010. If EPA promulgates a new standard for SO<sub>2</sub>, the Agency expects to identify or "designate" areas as meeting or not meeting the standard (or as unclassifiable) in 2012, within two years of the effective date of the standard. In the event of insufficient information, the Clean Air Act provides that EPA can take an additional year to designate areas.

## **DETERMINING COMPLIANCE**

- EPA is also proposing a new "form" for the standard. The form is the air quality statistic that is compared to the level of the standard to determine if an area meets the standard.
- For the new 1-hour SO<sub>2</sub> standard, EPA is proposing that the form be a 3-year average of the 4<sup>th</sup> highest daily maximum 1-hour average concentration in a year, or its equivalent (a 3-year average of the 99<sup>th</sup> percentile of the annual distribution of daily maximum 1-hour average concentrations).
- The 99<sup>th</sup> percentile and the 4<sup>th</sup> highest daily maximum in a year will be the same in a year if all days are monitored; the percentile form would account for days that lack monitoring data.

## **IMPLEMENTING THE PROPOSED SO<sub>2</sub> MONITORING NETWORK**

- EPA is proposing specific minimum requirements to guide where SO<sub>2</sub> monitors should be placed. At least 348 SO<sub>2</sub> monitoring sites nationwide would be required by this proposal.
- The proposal would establish two categories of required monitors in the revised SO<sub>2</sub> network:
  - Monitors that are required to be placed in Core Based Statistical Areas (CBSAs) based on population size and SO<sub>2</sub> emissions.

- Monitors to be located within a state based on that state's contribution to national SO<sub>2</sub> emissions. States will determine the specific location of these monitors within state boundaries (which can be inside or outside of CBSAs), with EPA approval.
- At the end of 2008, there were 488 SO<sub>2</sub> monitors in the network. EPA estimates that at least one-third of the SO<sub>2</sub> monitors in this existing network may meet the proposed siting requirements. States may, with EPA approval, relocate the existing monitors to meet the new siting requirements.
- EPA is proposing to require that all new SO<sub>2</sub> monitors be operational by January 1, 2013.
- EPA also is proposing changes to data reporting requirements. State and local agencies would be required to report 2 values for every hour of monitoring conducted:
  - The 1-hour averaged SO<sub>2</sub> concentration
  - The maximum five minute concentration every hour
- EPA Regional Administrators would have the authority to require additional monitoring in certain circumstances, such as in areas impacted by major industrial point sources or a combination of sources that are not already monitored.

## **BACKGROUND**

- The Clean Air Act requires EPA to set national ambient air quality standards for "criteria pollutants." Currently, sulfur oxides and five other major pollutants are criteria pollutants. The others are ozone, lead, carbon monoxide, nitrogen oxides, and particulate matter. The law also requires EPA to review the standards periodically and revise them if appropriate to ensure that they provide the requisite amount of health and environmental protection and to update those standards as necessary.
- Sulfur dioxide is one of a group of highly reactive gasses known as "oxides of sulfur." The largest sources of SO<sub>2</sub> emissions are from fossil fuel combustion at power plants (66 percent) and other industrial facilities (29 percent). Smaller sources of SO<sub>2</sub> emissions include industrial processes such as extracting metal from ore, and the burning of high-sulfur fuels by locomotives, large ships, and non-road equipment. SO<sub>2</sub> is linked with a number of adverse effects on the respiratory system.

- EPA first set NAAQS standards for SO<sub>2</sub> in 1971. EPA set a 24-hour primary standard at 140 ppb and an annual average standard at 30 ppb (to protect health). EPA also set a 3-hour average secondary standard at 500 ppb (to protect the public welfare).
- The last review of the SO<sub>2</sub> NAAQS was completed in 1996 and the Agency chose not to revise the standards.
- In the last review, EPA also considered, but did not set, a five-minute SO<sub>2</sub> NAAQS to protect asthmatics at elevated ventilation rates from bronchoconstriction and other respiratory symptoms associated with 5-10 minute peak concentrations of SO<sub>2</sub>.
- The decision not to set a five-minute standard in 1996 was challenged successfully by the American Lung Association and remanded back to EPA in 1998; no formal action with regard to the remand has been taken until this proposal.
- Under a judicial consent decree, EPA must complete this review of the primary SO<sub>2</sub> standard by June 2, 2010. The current review focuses only on the primary SO<sub>2</sub> standard. EPA will address the secondary standard for SO<sub>2</sub> as part of a separate proposal.
- Currently, there are several areas designated as being in nonattainment with the primary SO<sub>2</sub> NAAQS, although none of them currently exceed the NAAQS for regulatory purposes. However, if the SO<sub>2</sub> NAAQS is revised as a result of this review, some additional areas could be classified as nonattainment.
- All of these proposed changes are consistent with the advice and recommendations of EPA's principal independent science advisors on National Ambient Air Quality Standards: the Clean Air Act Scientific Advisory Committee.

## HOW TO COMMENT

- EPA will accept comment on the proposal for 60 days after publication in the Federal Register. Comments, identified by Docket ID No. EPA-HQ-OAR-2007-0352, may be submitted by one of the following methods:
  - [www.regulations.gov](http://www.regulations.gov): follow the on-line instructions for submitting comments.
  - E-mail: Comments may be sent by electronic mail (e-mail) to [a-and-r-Docket@epa.gov](mailto:a-and-r-Docket@epa.gov), Attention Docket ID No. EPA-HQ-OAR-2007-0352.

- Fax: Fax your comments to: 202-566-1741, Attention Docket ID. No. EPA-HQ-OAR-2007-0352.
- Mail: Send your comments to: Air and Radiation Docket and Information Center, Environmental Protection Agency, Mail Code: 6102T, 1200 Pennsylvania Ave., NW, Washington, DC, 20460, Attention Docket ID No. EPA-HQ-OAR-2007-0352.
- Hand Delivery or Courier: Deliver your comments to: EPA Docket Center, 1301 Constitution Ave., NW, Room 3334, Washington, D.C. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information

### **FOR MORE INFORMATION**

- To download a copy of the final rules, go to EPA's Web site at: <http://www.epa.gov/air/sulfurdioxide>
- Today's proposed rule and other background information are also available either electronically at <http://www.regulations.gov>, EPA's electronic public docket and comment system, or in hardcopy at the EPA Docket Center's Public Reading Room.
- The Public Reading Room is located in the EPA Headquarters, Room Number 3334 in the EPA West Building, located at 1301 Constitution Avenue, NW, Washington, DC. Hours of operation are 8:30 a.m. to 4:30 p.m. eastern standard time, Monday through Friday, excluding Federal holidays.
- Visitors are required to show photographic identification, pass through a metal detector, and sign the EPA visitor log. All visitor materials will be processed through an X-ray machine as well. Visitors will be provided a badge that must be visible at all times.

Materials for this proposed action can be accessed using Docket ID No. EPA-HQ-OAR-2007-0352.