New 1-Hr Air Quality Standards Pose Implementation Challenges

This article addresses the challenges the ‘new’ 1-hr air quality standards present to industry, particularly to those involved in generation of electricity, who are also subject to several other new regulations under the U.S. Clean Air Act.

In 2010, the U.S. Environmental Protection Agency (EPA) set two new National Ambient Air Quality Standards (NAAQS) in quick succession, both with one-hour (1-hr) averaging times. On February 9, EPA promulgated a NAAQS for nitrogen dioxide (NO₂) that limited the three-year average of the 98th percentile of the maximum daily 1-hr NO₂ concentration each year to 100 parts per billion (ppb). Then, a little more than four months later, the agency set a NAAQS for sulfur dioxide (SO₂) that limited the three-year average of the 99th percentile of the maximum daily 1-hr SO₂ concentration each year to 75 ppb. These standards are both very stringent and will pose a significant challenge for both the states charged with implementing them and those who the states regulate to ensure that the NAAQS are met.

Lack of Appropriate Implementation Rules and Guidance

The lack of appropriate rules—or even guidance—describing how these NAAQS are to be implemented has posed significant challenges to those they affect. Although the NAAQS themselves specify requirements for ambient monitoring, other important implementation issues are ignored or are addressed only in the rules’ preambles. For example, neither of the rules addresses key questions related to permitting of new or modified major sources. In addition, vital issues concerning the basis for designations of areas as attainment, nonattainment, or unclassifiable for the SO₂ are addressed only in what EPA characterizes as nonbinding statements in the rule’s preamble. This is also the case for what EPA itself acknowledges is a nontraditional approach for the initial State Implementation Plans (SIPs) that states must submit for all areas within three years after EPA promulgates a new NAAQS. The U.S. Court of Appeals for the District of Columbia Circuit has recently held that these preamble statements do not represent final action by EPA, confirming they do not provide clear direction on implementation. Eschewing rules in favor of guidance to address these important implementation matters, EPA has issued a series of guidance documents that have required revision as EPA is confronted with the inadequacies of its initial efforts. Had EPA instead taken the approach of seeking public comment on
proposed rules prior to implementation of the standards, the problems with the agency’s initial approaches might have been discovered before implementation proceeded. Instead, clarity on implementation requirements is still lacking.

For example, in the case of the NO2 NAAQS, EPA’s earliest guidance followed publication of that rule in the Federal Register by almost two months. That guidance stated that all permit applications for new or modified major sources—even pending ones—were required to demonstrate compliance with the new NO2 NAAQS. A virtual moratorium on new source permits was ensured as a variety of large and small sources seeking permits were predicted to cause violations of the 1-hr NO2 NAAQS. As a result, EPA issued further guidance three months later “so that permits [could] be issued.” That guidance also proved inadequate to allow permitting to move forward. In one well-publicized case involving permitting of a state-of-the-art natural gas-fired power plant, Gina McCarthy, EPA’s Assistant Administrator for the Office of Air and Radiation, acknowledged, “EPA and applicants seeking . . . permits to construct stationary sources of air pollution have experienced some unforeseen challenges with the preparation and review of information to predict the impact of proposed sources on hourly NO2 concentrations.” Shortly thereafter, EPA provided still more guidance that added greater flexibility to the modeling that was required to support permitting. Modeling of 1-hr NO2 concentrations still remains problematic, however.

Initial guidance on implementation of the SO2 NAAQS that addressed new source permitting was also issued two months after the rule’s publication, and has similarly proved problematic. Guidance that expanded on the approaches to designations and SIPs that were first raised in the preamble to the rule followed. Then, on April 12, 2012, EPA sent letters to states and tribes indicating that the agency was shifting away from the implementation approach that it had signaled in the June 2010 preamble to the SO2 NAAQS and in its guidance. EPA subsequently released a draft “white paper” discussing other possible implementation approaches for comment, leaving sources uncertain about the requirements they may face or the timing of such requirements.

Inadequate Modeling Tools

As these guidance documents were pursued, it became apparent that appropriate tools are not
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available to implement either of the 1-hr NAAQS. In particular, EPA has not identified models and modeling techniques that provide realistic estimates of the relationship between emissions and hourly-average concentrations of these pollutants in ambient air. Although EPA has approved an air quality dispersion model, AERMOD, for addressing both NO2 and SO2 that theoretically could be applied when implementing these NAAQS, EPA has modified AERMOD since its initial approval and the model’s subsequent appropriateness for assessing compliance with the 1-hr standards has not been demonstrated.

Moreover, even the evaluation of AERMOD, as it was initially approved, is inconsistent with the way that EPA expects the model to be used. For example, the model was evaluated using actual source emission rates, which are variable. For regulatory compliance modeling, however, EPA specifies the highly unrealistic assumption that a source operates continuously at its maximum allowable or permitted rate. Furthermore, AERMOD fails to characterize the chemistry of NO2 formation in ambient air accurately and performs poorly at low wind speeds, leading in both cases to excessively high predictions of hourly pollutant concentrations. The lack of tools to provide realistic estimates of ambient air quality means that sources of NO2 and SO2, such as those owned and operated by electric generating companies, fear that they will be unable to permit new sources and will be subject to controls that are neither necessary nor appropriate to provide for attainment of these new NAAQS.

Electric Generators Face Multiple Regulatory Requirements

Electric generating companies not only face the challenge of implementing the 1-hr NO2 and SO2 NAAQS, they also face several other new regulatory programs that will affect their allowable emissions. The Cross-State Air Pollution Rule (CSAPR) will limit allowable emissions of SO2 and nitrogen oxides, a precursor of NO2, from many power plants. The Mercury and Air Toxics Rule (MATS) will affect power plant SO2 emissions. The timing for emission reductions required by each of these rules differs and—as for the 1-hr NAAQS—remains uncertain. EPA’s new greenhouse gas regulations, which call into question the future viability of coal as a fuel, add yet another layer of regulatory complexity. Electric generating companies must take all of these regulations into account as they plan their future operations. They must decide whether, and if so, how and when, to reduce emissions from individual plants or whether and when to shut down a plant. These decisions are even more complicated in light of concerns over the possibility of unnecessary control requirements purportedly aimed at attaining the 1-hr NAAQS.

Conclusion

In short, implementation of the new 1-hr NAAQS is challenging for everyone. Given the limited time and inadequate tools to develop appropriate implementation strategies, industries are concerned that they may face unnecessary and potentially unattainable emissions limits on existing sources due to these standards. Moreover, the 1-hr NAAQS pose significant obstacles to expanding existing sources or building new ones in this country. The challenges are compounded for electric generating companies. They must take these standards and several other new regulatory programs into account as they make plans for meeting the country’s need for power at a reasonable price.

References

1. 75 Fed. Reg. 6474 (Feb. 9, 2010).
2. 75 Fed. Reg. 35520 (June 22, 2010).