

## Notice Regarding Modeling for New Hourly NO<sub>2</sub> NAAQS

On January 22, 2010, EPA announced a new hourly NO<sub>2</sub> standard of 100 ppb based on the 3-year average of the 98<sup>th</sup>-percentile of the annual distribution of daily maximum 1-hour concentrations. The final rule for the new hourly NAAQS was published in the Federal Register on February 9, 2010, and the standard will be effective on April 12, 2010.

The Air Quality Modeling Group (AQMG) has received several inquiries regarding the use of the AERMOD model in relation to the new hourly NO<sub>2</sub> standard; specifically, how AERMOD can be applied to calculate NO<sub>2</sub> impacts for comparison to the new standard. A summary of the procedures that can be used to calculate the NO<sub>2</sub> design value for comparison to the 1-hour NAAQS is presented below. At this time, AQMG is not considering modifying AERMOD to accommodate the form of the new 1-hour NO<sub>2</sub> standard, but will be developing a more generic AERMOD post-processor to address this need. The AERMOD post-processor will also have the capability of calculating the design values for other criteria pollutants, as well as generating statistics that may meet a wider range of current and future needs. While the generic AERMOD post-processor is being developed, AQMG will develop a more limited AERMOD NO<sub>2</sub> post-processor for use on an interim basis. A note will be posted under “Recent Additions” on the SCRAM webpage when the NO<sub>2</sub> post-processor is available.

Section 8.3.1.2 of the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W) provides guidance on the length of the meteorological data record for dispersion modeling, stating that “[T]he use of 5 years of NWS meteorological data or at least 1 year of site specific data is required.” Appendix W also states that “one year or more (including partial years), up to five years, of site specific data” are preferred for use in air quality analyses. However, since modeled results for NO<sub>2</sub> are averaged across the number of years modeled for comparison to the new hourly standard, the meteorological data period should include complete years of data to avoid introducing a seasonal bias to the averaged impacts. While the 1-hour NAAQS for NO<sub>2</sub> is defined in terms of the 3-year average for monitored design values to determine attainment of the NAAQS, this definition does not preempt the Appendix W requirement for use of 5 years of NWS data, and the 5-year average serves as an unbiased estimate of the 3-year average for purposes of modeling demonstrations of compliance with the NAAQS. Other issues or questions that may arise regarding dispersion modeling in relation to the new hourly NO<sub>2</sub> standard will be addressed as needed during implementation of the new NAAQS.

Procedures for calculating the NO<sub>2</sub> design value for comparison to the 1-hour NAAQS:

1. Run AERMOD for the selected meteorological data period, retaining hourly concentrations at each receptor for each hour within the modeled period using the hourly POSTFILE option (Note: PLOTFILES will not provide the required data). The concentrations used in the calculations should represent contributions from all modeled sources. When 5 years of NWS data are used, data processing may be easier if each year is run separately.
2. From hourly AERMOD POSTFILE output (every hour of the modeled period), for each receptor, determine the maximum 1-hour concentration for each day of the data period.

3. At each receptor, for each year modeled, determine the 8<sup>th</sup>-highest daily 1-hour maximum concentration from the distribution of 365 or 366 daily 1-hour maximum concentrations. The 8<sup>th</sup>-highest concentration is representative of the 98<sup>th</sup>-percentile concentration from the distribution of daily 1-hour maximum values.
4. At each receptor, average the 8<sup>th</sup>-highest daily 1-hour maximum concentrations across the modeled years.
5. The highest of the average 8<sup>th</sup>-highest (98<sup>th</sup>-percentile) concentrations across all receptors, based on the length of the meteorological data period, represents the modeled 1-hour NO<sub>2</sub> design value based on the form of the standard. Since AERMOD concentrations are in  $\mu\text{g}/\text{m}^3$ , and the standard is expressed in ppb, the user will need to convert from  $\mu\text{g}/\text{m}^3$  to ppb. The relationship for the annual NO<sub>2</sub> standard, 53 ppb = 100  $\mu\text{g}/\text{m}^3$ , provides a basis for this conversion.