

support EPA's determination that attainment of the 1-hour ozone NAAQS will be achieved in 2005. One of these WOE analyses involved the use of a relative reduction factor (derived from the local model results) to determine if any additional NO_x and VOC emissions reductions are needed to attain. We used the photochemical grid model in a relative sense to determine if the response of ozone concentrations to controls was adequate to predict a future design value below the level of the NAAQS. Inherent in the base design value is the level and form of the NAAQS which allows exceedances in the future.

In contrast to the claims in the adverse comments, EPA did not rely on "proportional" rollback as defined in section 14.0 of 40 CFR part 51, appendix W which defines "rollback" as "a simple model that assumes that if emissions from each source affecting a given receptor are decreased by the same percentage, ambient air quality concentrations decrease proportionately." The prohibition regarding proportional modeling in section 6.2.1.e of appendix W (*i.e.*, "Proportional (rollback/forward) modeling is not an acceptable procedure for evaluating ozone control strategies") applies to the use of a rollback method which is empirically/mathematically derived and independent of model estimates or observed air quality and emissions changes as the sole method for evaluating control strategies. A true proportional rollback model does not rely on any photochemical grid modeling, and it assumes, for example, that a 20 percent decrease in NO_x emissions results in a proportional (*i.e.*, 20 percent) decrease in ozone concentrations. In this case, EPA used a locally derived relative reduction factor as determined by the photochemical grid model to estimate a future design value.

Other comments on the 1999 Guidance are not germane to the Washington area.

The comments alleged flaws in the two techniques for determining the magnitude of additional emission reductions. With respect to comments on these two techniques for determining the magnitude of additional emission reductions contained in the 1999 Guidance, EPA believes these comments do not apply in the case of EPA's analysis of the attainment demonstration for the Washington area.

The first allegation is that these techniques allow averaging the three highest design values across a nonattainment area whereas EPA's modeling guidance requires that

attainment be demonstrated at each site. The alleged effect of this averaging technique is that lower air quality concentrations are averaged against higher concentrations thus reducing the total emission reduction needed to attain at the highest site.

The second allegation concerns the assumption that the contribution of VOC versus NO_x emissions to ozone concentrations are the same from site to site in contrast the UAM model which considers the contribution of VOC versus NO_x emissions varies from site to site.

The 1999 Guidance provided a two-step method for evaluating the air quality modeling results. The first step is an assessment of whether attainment is demonstrated by a showing that a future year design value will be 0.124 ppm or less. In the event that the predicted attainment year design value is above the standard, the second step of the 1999 Guidance provides two techniques for identifying additional emission reductions, that were not modeled, and which at a minimum provide an estimated attainment year design value at the level of the standard. The first technique is the use of a "relative reduction factor (RRF)" analysis to estimate a future design value.⁷ We used this analytical method to demonstrate that the Washington area will attain the standard. Attainment can be demonstrated by showing that the future year design value will be 0.124 ppm or less. Modeling predicts the peak ozone values in the attainment year, but it cannot predict the future design value for that year due to the limited number of days that can reasonably be modeled. The RRF analysis, however, provides an estimate of future design value based on the principle that a control strategy that reduces ozone peaks will similarly reduce design values. The RRF analysis has two steps. First, the state derives the RRF from the modeled reduction in ozone peaks between the base year and the attainment year. Second, the state applies the RRF to the design value for the base year to estimate the future design value in the attainment year. EPA has concluded that for the Washington area the RRF analysis demonstrates a future year design value of 119.6 ppb which is less than 124 ppb. Using the 1999 Guidance, EPA never needed to go beyond the RRF technique to determine that the Washington area will attain the ozone standard. Therefore, the other comments regarding the techniques for determining the magnitude of such additional reductions are not germane to

this rulemaking and are not addressed in this document.

EPA's treatment of over-prediction of ozone levels, of modeled exceedances and downward adjustment of results.

As another element of EPA's WOE analysis, we evaluated the photochemical grid modeling for the Washington area. We analyzed the severity of the episodes modeled for the Washington area and have concluded that these would be adequate for determining the emission reductions needed for attainment in the Washington area. When the emission inventory with the control strategy is modeled, peak ozone concentration is reduced by approximately 22 ppb from the modeled peak concentrations in the 1991 base cases. When the average modeled peak ozone reduction from the base year modeling to the attainment year modeling (22 ppb) is subtracted from the peak measured concentration for July 16 (137 ppb) and July 19 (132 ppb), the resulting concentrations are 115 ppb and 110 ppb respectively. However, when the modeled ozone reduction is applied to the peak monitored level on July 20 (178 ppb), the resulting concentration is 156 ppb. When the day-specific reduction of peak modeled ozone concentration from the base year modeling to the attainment year modeling is subtracted from the peak measured concentrations on July 16th, July 19th, and July 20th, the result is 120 ppb, 103 ppb, and 158 ppb respectively. Both methods (average, day-specific) resulted in two of the three days showing values below the ozone standard indicating attainment for these days. However, both methods resulted in values above the standard for July 20th.⁸

EPA has evaluated the ozone formation potential of the July 20, 1991, episode day and determined that it is 13th most severe day out of approximately the last 50 years with an average reoccurrence of once every 4–5 years; this type of day is not likely to occur often enough to be a major causative factor for nonattainment because the standard allows up to three monitored exceedances in any three year period. Because modeling for the Washington area showed some peak concentrations above 124 ppb, EPA conducted the RRF analysis which is

⁸ The details of this analysis and the method and calculation details by which EPA determined how much the model over-predicts monitored ozone concentrations is explained in "First Amendment to Technical Support Document for Approval and Promulgation of Air Quality Implementation Plans; District of Columbia, Maryland, and Virginia; Post-1996 Rate-of-Progress Plan for the Metropolitan Washington, DC Nonattainment Area" dated April 10, 2003.

⁷ 1999 Guidance at 3–4.