

accounted for and relied on. Modeling results for 1999 were then compared with modeling results for 2007 (only two strategy days, July 8 and July 11, are used for 2007, because these are the only two days for which 2007 boundary conditions are available) to estimate changes between 1999 and 2007.

The average predicted change in ozone levels between 1999 and 2007 was determined for each 9-cell block of surface cells containing and surrounding each Rhode Island monitor (*i.e.*, the cell containing the monitor and the 8 surrounding cells). The average predicted change in ozone level was then divided by the 1999 average modeled concentration, in order to calculate the percent ozone reduction between 1999 and 2007. The percent ozone reduction for each monitoring location in Rhode Island are presented in the state's submittal.

### 3. Predicted Ozone Design Values for 2007

The third step was to determine a 2007 ozone design value for each Rhode Island ozone monitoring station location. This was accomplished by reducing the 1997 ozone design value by the percent ozone reduction predicted for each monitoring location derived in step 2, above. If the resulting design value dropped below the one-hour ozone standard, it is reasonable to assume that the monitor can attain the one-hour ozone standard by 2007. Rhode Island showed in their submittal that the predicted 2007 design values for all monitors in Rhode Island are all below the one-hour ozone NAAQS, except for one day at the East Providence monitor. As discussed in detail below, additional reduction in emissions will bring this monitor's predicted design value below the standard by 2007 as well.

For the West Greenwich monitor (the monitor currently with the highest design value), there was a reduction in ozone levels of 24 percent for the July 8 episode and a reduction in ozone levels of 13 percent at the West Greenwich monitor for the July 11 episode. For both episodes, the future adjusted design value for the West Greenwich monitor is predicted to be below the one-hour ozone standard (0.105 ppm for July 8 and 0.124 ppm for July 11.)

It should also be noted that Rhode Island DEM performed this same analysis for all of the ozone monitors in Massachusetts, New Hampshire and Maine that are also in the CALGRID modeling domain (*i.e.*, the areas downwind of Rhode Island that may be affected by pollution transport from

Rhode Island on ozone conducive days). The results from this analysis, which are contained in the submittal, show that all of these monitors are predicted to have ozone values below the one-hour standard by 2007. This is consistent with the EPA-approved attainment demonstrations for both New Hampshire (67 FR 72574; 12/6/02) and Massachusetts for both the Eastern (67 FR 72576; 12/6/02) and Western Massachusetts (66 FR 665; 1/3/01) serious ozone nonattainment area.

### 4. Predicted Ozone Design Values for 2007 With the Tier 2/Gasoline Sulfur Program

As previously noted, the CALGRID runs for 2007 included the benefits of the NO<sub>x</sub> SIP call as well as other CAA measures, but did not account for the Tier 2/Gasoline Sulfur program. The Tier 2/Gasoline Sulfur program consists of emission reductions due to more protective tailpipe emissions standards for all passenger vehicles, including sport utility vehicles (SUVs), minivans, vans and pick-up trucks, as well as lower standards for sulfur in gasoline. These new standards require passenger vehicles to be 77 to 95 percent cleaner than those on the road today and to reduce the sulfur content of gasoline by up to 90 percent. This program, which does not achieve emission reductions until 2004 and beyond, was not included in the CALGRID modeling analysis discussed above.

Rhode Island DEM, however, has looked at the EPA modeling performed in 1999<sup>12</sup> to assess the effectiveness of the Tier 2/Gasoline Sulfur. For three episodes in the summer of 1995, EPA performed two sets of modeling runs: one run with 2007 CAA emission files including emission reductions associated with Tier 2/Gasoline Sulfur program and a second run that did not include Tier 2/Gasoline Sulfur program emission reductions. In both cases, the CAA emission files included EPA's NO<sub>x</sub> SIP Call emission reductions. After the modeling runs were completed, EPA used the modeling results in a relative manner to estimate the percent ozone reduction associated with the Tier 2/Gasoline Sulfur program.

Rhode Island DEM included the predicted ozone design values for the 2007 CAA run and the 2007 Tier 2 run for each county in the Rhode Island nonattainment area. As shown in their submittal, the benefit at all ozone monitors in Rhode Island is at least an additional 0.001 ppm, over what

CALGRID predicted. The improvement at the East Providence monitor is 1%. The Tier 2 modeling performed by EPA showed all 2007 design values for Rhode Island less than the one-hour standard. This combined with the results of the CALGRID analysis add to the weight-of-evidence.

Rhode Island DEM believes it is reasonable to conclude that the design value at the East Providence monitor for 2007 will be reduced by approximately 1 percent once the Tier 2/Gasoline Sulfur program is implemented, which will result in attainment of the one-hour standard at that monitor and throughout Rhode Island.

### 5. Conclusions From the Future Air Quality Design Value Analysis

Through this additional analysis, Rhode Island DEM has demonstrated that substantial ozone reductions can be expected to occur after the implementation of a number of control strategies that are in place both within and upwind of the New England Domain. Those strategies include EPA's NO<sub>x</sub> SIP Call as well as EPA's Tier 2/Gasoline Sulfur program. Therefore, EPA believes it is reasonable to conclude that the Rhode Island nonattainment area will attain the one-hour ozone standard by 2007. While the absolute modeling results do not demonstrate attainment, the modeling results are useful in demonstrating a relative reduction in ozone levels sufficient to demonstrate attainment in 2007.

### 6. Additional Evidence To Support Attainment in Rhode Island

In addition to the ozone design value analysis performed by the Rhode Island DEM, EPA performed an additional design value analysis using a slightly different method. EPA used the CALGRID modeling in a relative sense to estimate a future design value. EPA compared base case CALGRID runs to future case CALGRID runs to estimate the improvement in ozone air quality levels between the base and future cases. Four strategy days (August 15 and 17 1987; July 8, 1988 and July 11, 1988)<sup>13</sup> are used in this analysis, which compared the improvement in modeled air quality between the base and future modeling cases. The following procedure is applied. First, base case CALGRID runs are examined to discern the maximum one-hour ozone concentration modeled in Rhode Island. The four strategy days are all examined.

<sup>12</sup> See "Technical Support Document for the Tier 2/Gasoline Sulfur Ozone Modeling Analyses," EPA-420-R-99-031, December 1999.

<sup>13</sup> The June 22, 1988 strategy day is not used because of problems re-analyzing the base case model run for this episode.