5.0 Meeting Reasonable Further Progress Requirements

The Phase 2 Ozone Implementation Rule[1] includes EPA's interpretation of the CAA requirement that nonattainment areas demonstrate reasonable further progress (RFP) towards attaining the ozone NAAQS. For moderate 8-hour ozone nonattainment areas, such as Greater Connecticut and Southwest Connecticut, with attainment dates at least five years after designation, the rule requires a demonstration that areas will achieve at least a 15% emission reduction between 2002 and 2008. The 15% reduction requirement can be satisfied with any combination of VOC and NO_X reductions. Additional reductions are also required to achieve attainment beyond 2008.

In order to demonstrate RFP, a region must show that its projected emissions, termed controlled inventories, of NO_X and VOC will be less than or equal to the target levels set for the end of the RFP period, or "milestone year." For the 2002-2008 RFP period, the "target inventories" of emissions are the maximum quantity of anthropogenic emissions permissible during the 2008 milestone year. This section describes the methodology and calculations used to establish the 2008 target inventories for both the Greater Connecticut and Southwest Connecticut areas. It also demonstrates that both areas will meet RFP requirements because projected NO_X and VOC emissions will be less than the calculated target levels.

5.1 Methodology and Calculations for Determining Emission Target Levels

Procedures for determining emissions levels for the 2008 RFP targets are specified by EPA in Appendix A to the Preamble of the Phase 2 rule[2]. EPA provided additional guidance in a memorandum issued in August 2006[3]. The following methodology description and calculations comport with those procedures.

5.2 Calculation of 2008 Target Levels

EPA's RFP methodology specifies the steps involved in calculating 2008 emission target levels that satisfy the 15% RFP emission reduction requirement.

Step 1: Develop 2002 Base Year RFP Inventory

The 2002 RFP inventory is comprised of all anthropogenic sources of VOC and NO_X for a typical ozone season weekday in 2002, including all control programs in place at that time. The 2002 baseline RFP inventory, which is identical to the 2002 Base Year Inventory presented in Section 4.1.3, is summarized in Tables 5.2.1 and 5.2.2 for each of Connecticut's nonattainment areas.

[1] 70 FR 71612.
[2] 70 FR 71696.
[3] "8-Hour Ozone National Ambient Air Quality Standards (NAAQS) Implementation – Reasonable Further Progress (RFP)"; Memorandum from William T. Harnett (EPA OAQPS) to Regional Air Division Directors; August 15, 2006; See: http://www.epa.gov/air/ozonepollution/SIPToolkit/documents/rfp_20060815.pdf.

Table 5.2.1
Greater Connecticut's 2002 Reasonable Further Progress Inventory
(tons / summer day)

Source Category	VOC	NO_X
Stationary Point	4.6	19.0
Stationary Area	75.5	6.4
On - Road Mobile	45.1	89.3
Non - Road Mobile	56.2	30.8
Total Anthropogenic	**181.4**	**145.5**

Table 5.2.2
Southwest Connecticut's 2002 Reasonable Further Progress Inventory
(tons / summer day)

Source Category	VOC	NO_X
Stationary Point	11.3	37.7
Stationary Area	84.1	7.2
On - Road Mobile	48.3	102.7
Non - Road Mobile	66.0	38.7
Total Anthropogenic	**209.7**	**186.3**

Step 2: Develop 2002 and 2008 Adjusted RFP Inventories

The CAA prohibits the use of emission reductions from some control measures that could otherwise contribute towards meeting the 15% RFP requirements. The reductions needed to satisfy RFP must be calculated from an emissions baseline that excludes the effect of the reductions in ozone precursors resulting from the following on-road mobile source control programs:

1) Federal Motor Vehicle Control Program (FMVCP) tailpipe and evaporative standards applicable as of January 1, 1990; and
2) Federal regulations limiting the Reid Vapor Pressure (RVP) of gasoline in ozone nonattainment areas applicable as of June 15, 1990.

Therefore, the 2002 baseline must be adjusted by subtracting the VOC and NO_X reductions that result from these two programs between 2002 and 2008.

In order to calculate the non-creditable emission reductions, adjusted on-road mobile source sector inventories must be developed for both 2002 and 2008. EPA's RFP methodology specifies that these inventories be developed using the same set of MOBILE6.2 inputs, except for the model run year (i.e., 2002 and 2008). Required inputs are summarized as follows:

1) 1990 Inspection and Maintenance Program;
2) Gasoline RVP = 9.0 pounds per square inch;
3) No post-1990 CAA measures;
4) 2002 vehicle activity inputs;
5) 2002 vehicle miles traveled; and
6) Model run year of either 2002 or 2008.

The MOBILE6.2 input files are included in Appendix 5A. The resulting 2002 and 2008 adjusted RFP inventories are summarized in Tables 5.2.3 and 5.2.4 for the Greater Connecticut and Southwest Connecticut areas, respectively. Note that the 2002 and 2008 adjusted RFP inventories are identical for all source categories except for on-road mobile sources.

Step 3: Calculate Non-creditable Emission Reductions

The post-1990 emission reductions that are not creditable for RFP purposes are simply the difference between the 2002 and 2008 adjusted RFP inventories. These non-creditable VOC and NO_X reductions are included in the last column of Tables 5.2.3 and 5.2.4.

Table 5.2.3
Greater Connecticut 2002 and 2008 Adjusted RFP Inventories and Non-Creditable Reductions
(tons / summer day)

	VOC			NO_X		
Source Category	**2002**	**2008**	**Non Creditable**	**2002**	**2008**	**Non Creditable**
Stationary Point	4.6	4.6	0.0	19.0	19.0	0.0
Stationary Area	75.5	75.5	0.0	6.4	6.4	0.0
On–Road Mobile	76.1	71.8	4.3	106.4	97.2	9.3
Non-Road Mobile	56.2	56.2	0.0	30.8	30.8	0.0
Total	209.9	205.7	**4.3**	162.6	153.4	**9.3**

Table 5.2.4
Southwest Connecticut 2002 and 2008 Adjusted RFP Inventories and Non-Creditable Reductions
(tons / summer day)

	VOC			NO_X		
Source Category	**2002**	**2008**	**Non Creditable**	**2002**	**2008**	**Non Creditable**
Stationary Point	11.3	11.3	0.0	11.3	11.3	0.0
Stationary Area	84.1	84.1	0.0	81.8	81.8	0.0
On–Road Mobile	80.2	75.7	4.5	121.7	110.0	11.7
Non-Road Mobile	66.0	66.0	0.0	66.0	66.0	0.0
Total	239.2	234.7	**4.5**	280.7	269.0	**11.7**

Step 4: Calculate 2008 Emission Target Levels

EPA's RFP methodology specifies that the required 15% RFP reduction can come from any combination of VOC and NO_X reductions occurring between 2002 and 2008, the total of which meets or exceeds the 15% requirement. CTDEP has elected to establish 2008 emission target levels based on a 10% reduction in VOC emissions and a 5% reduction in NO_X emissions. Expressed in equation form, corresponding VOC and NO_X 2008 target levels are:

2008 VOC RFP Target Level = (2002 RFP Base Year VOC Emissions – Non-creditable emission reductions between 2002 and 2008) * (100% - 10% VOC reduction)

2008 NOx RFP Target Level = (2002 RFP Base Year NO_X Emissions – Non-creditable emission reductions between 2002 and 2008) * (100% - 5% VOC reduction)

Tables 5.2.5 and 5.2.6 show the calculations and resulting 2008 VOC and NO_X RFP target emission levels for Greater Connecticut and Southwest Connecticut, respectively.

Table 5.2.5:
Greater Connecticut
Calculation of 2008 Target Levels
(tons / summer day)

Step-By-Step Description	VOC	NO_X
2002 RFP Inventory (a)	181.4	145.5
Non-creditable emissions reduction (b)	4.3	9.3
2002 Adjusted Base Year Inventory (c) = (a-b)	177.1	136.3
Selected % Reduction (d)	10%	5%
Required RFP Reduction (e) = (c * d)	17.7	6.8
2008 Target Level (f) = (c – e)	**159.4**	**129.5**

Table 5.2.6
Southwest Connecticut
Calculation of 2008 Target Levels
(tons / summer day)

Step-By-Step Description	VOC	NO_X
2002 RFP Inventory (a)	209.7	186.3
Non-creditable emissions reduction (b)	4.5	11.7
2002 Adjusted Base Year Inventory (c) = (a-b)	205.2	174.6
Selected % Reduction (d)	10%	5%
Required RFP Reduction (e) = (c * d)	20.5	8.7
2008 Target Level (f) = (c – e)	**184.6**	**165.9**

5.3 Compliance with 2008 RFP Requirements

In order to comply with RFP requirements, projected emissions of VOC and NO_X must be less than or equal to the target emission levels calculated for the 2008 milestone year. Tables 5.3.1

and 5.3.2 compare 2008 projected emission levels (from Section 4.3.3) to calculated target levels (determined in Section 5.2) for the Greater Connecticut and Southwest Connecticut areas, respectively.

Projected 2008 emissions in both areas are significantly less than the required RFP target levels corresponding to a total of 15% reduction in VOC and/or NO_X emissions. For Greater Connecticut, the combined reduction of VOC and NO_X emissions is projected to be 37.2%, more than double the required 15% reduction. Similarly for Southwest Connecticut, the projected combined VOC and NO_X reduction of 37.8% is also more than double the RFP requirement for 2008.

Table 5.3.1
Greater Connecticut
Demonstration of Reasonable Further Progress
Comparison of 2008 Projected and Target Level Emissions
(tons / summer day)

Description	Anthropogenic VOC	Anthropogenic NO_X
2008 Reasonable Further Progress Target Levels (Portion of Required 15% VOC+ NO_X RFP)	159.4 (10%)	129.5 (5%)
2008 Projected Emissions (% Reduction Projected to be Achieved)	149.3 (15.7%)	107.0 (21.5%)
Combined VOC + NO_X Reduction	37.2%	
Excess Reduction Beyond 15% Requirement	22.2%	

Table 5.3.2
Southwest Connecticut
Demonstration of Reasonable Further Progress
Comparison of 2008 Projected and Target Level Emissions
(tons / summer day)

Description	Anthropogenic VOC	Anthropogenic NO_X
2008 Reasonable Further Progress Target Levels (Portion of Required 15% VOC+ NO_X RFP)	184.6 (10%)	165.9 (5%)
2008 Projected Emissions (% Reduction Projected to be Achieved)	167.6 (18.3%)	140.5 (19.5%)
Combined VOC + NO_X Reduction	37.8%	
Excess Reduction Beyond 15% Requirement	22.8%	

5.4 RFP Contingency Requirements

Under CAA section 172(c)(9), 8-hour ozone nonattainment areas are required to include contingency measures in the SIP, to be implemented without further action by the State or by EPA, in the event the area fails to meet RFP requirements. The contingency measures for the 2008 RFP demonstration must be sufficient to provide any combination of VOC and/or NO_X emission reductions, the total of which will be equivalent to 3% of the 2002 adjusted base year inventory. A minimum of 0.3% VOC reduction must be included.

As depicted in Tables 5.3.1 and 5.3.2, control programs that have been adopted in each of Connecticut's 8-hour ozone nonattainment areas are projected to provide combined VOC and NO_X reductions that exceed the RFP requirement by more than 20% relative to the 2002 adjusted base year inventory. This surplus of emission reductions in 2008 more than covers the additional 3% reduction required by the RFP contingency requirement. Furthermore, the excess VOC reductions of 5.7% in Greater Connecticut and 8.3% in Southwest Connecticut (see Tables 5.3.1 and 5.3.2) are sufficient to cover the requirement that at least 0.3% of the contingency come from VOC reductions. As summarized previously in Table 4.3.2, a significant portion of projected emission reductions through 2008 result from federal new engine and fuel standards for on-road and non-road mobile sources. Those reductions are projected to increase substantially in the years beyond 2008, ensuring continued improvement in ozone air quality.