

Region III Plan Summary

Reasonable Further Progress Plan, Contingency Measures, Motor Vehicle Emissions Budgets for the Baltimore 1997 8-Hour Ozone Serious Nonattainment Area

Title: Reasonable Further Progress Plan, Contingency Measures, Motor Vehicle Emissions Budgets for the Baltimore 1997 8-Hour Ozone Serious Nonattainment Area

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EPA Effective date: August 31, 2016

State Submittal Date: July 22, 2013

Affected Areas: The Baltimore Area includes Baltimore City and Anne Arundel, Baltimore City, Carroll, Harford, and Howard Counties, which are all in Maryland.

Summary of the Plan

The revision consists of the serious nonattainment area reasonable further progress (RFP) plan for the Baltimore nonattainment area for the 1997 8-hour national ambient air quality standard (NAAQS). The SIP revision includes 2011 and 2012 RFP milestones, contingency measures for failure to meet RFP, and updates to the 2002 base year inventory and the 2008 reasonable RFP plan previously approved by EPA. EPA is also approving the transportation conformity motor vehicle emissions budgets (MVEBs) associated with this revision. On July 22, 2013, the Maryland Department of the Environment (MDE) submitted the “Baltimore Serious Nonattainment Area 0.08 ppm 8-Hour Ozone State Implementation Plan Demonstrating Rate of Progress for 2008, 2011 and 2012 Revision to 2002 Base Year Emissions; and Serious Area Attainment Demonstration, SIP Number: 13-07” as a SIP revision.

The SIP revision submittal included updates to portions of Maryland’s previously approved SIP for the 1997 8-hour ozone NAAQS, including the approved 2002 base year emissions inventory and 2008 RFP plan. The SIP revision also included RFP for 2011 and 2012, an attainment demonstration, contingency measures for RFP and attainment, a reasonably available control measures (RACM) determination, and 2012 MVEBs. After EPA made a determination on May 26, 2015 that Baltimore had attained the 1997 8-hour ozone NAAQS, Maryland withdrew from EPA consideration on October 20, 2015 portions of the July 22, 2013 serious area SIP submittal including the attainment demonstration, contingency measures for attainment, and the RACM analysis. Therefore, those elements are not addressed in this rulemaking action. In this rulemaking, EPA is approving of the remainder of the July 22, 2013 submittal as a revision to the Maryland SIP, because the measures strengthen the Maryland SIP.

A summary of the approved and updated Baltimore Area 2002 base year VOC and NO_x emissions inventories are included in Table 1. Please note that the updates to the onroad and nonroad emissions result in a lower total base year emissions inventory for VOCs, and a higher total for NO_x.

Table 1. Comparison of SIP Approved Versus Updated Baltimore Area 2002 Base Year VOC and NO_x Emissions (Ozone Season Tons per Day (tpd))

Emission Source Category	VOC		NO _x	
	SIP Approved	Updated	SIP Approved	Updated
Point	13.88	13.88	111.88	111.89
Stationary Area	116.81	116.81	8.18	8.18
Nonroad Mobile	70.22	59.61	40.96	49.18
Onroad Mobile	70.57	72.48	177.06	202.22
Total (excluding Biogenic Emissions)	271.48	262.77*	338.08	371.47
Biogenic Emissions	223.20	223.20	0	0

*Note: The 2002 updated data is pulled from Table 5-1 in the Serious Area Plan. With that table, MDE states, "Small discrepancies may result due to rounding."

Adjusted Base Year Inventory, 2008 RFP Target Levels, and Determination of 2008 RFP

The Baltimore Area was originally classified as moderate for the 1997 8-hour ozone NAAQS. As such, the CAA requires a 15 percent (%) reduction in ozone precursor emissions over an initial 6-year period. In the Phase 2 Rule (70 FR 71612, November 29, 2005), EPA interpreted this requirement for areas that were also designated nonattainment and classified as moderate or higher for the 1-hour ozone standard. In the Phase 2 Rule, EPA provided that an area classified as moderate or higher that has the same boundaries as an area, or is entirely composed of several areas or portions of areas, for which EPA fully approved a 15% plan for the 1-hour NAAQS, is considered to have met the requirements of section 182(b)(1) of the CAA for the 8-hour NAAQS. In this situation, a moderate nonattainment area is subject to RFP under section 172(c)(2) of the CAA and shall submit, no later than 3 years after designation for the 8-hour NAAQS, a SIP revision that meets the requirements of 40 CFR 51.910(b)(2). The RFP SIP revision must provide for a 15% emission reduction (either NO_x and/or VOC) accounting for any growth that occurs during the 6-year period following the baseline emissions inventory year, that is, 2002-2008.

The Baltimore Area was classified as severe under the 1-hour ozone standard, and had the same boundary as the Baltimore Area under the 1997 8-hour ozone standard. On July 12, 1995, Maryland submitted a 15% Plan SIP revision for the Baltimore Area. On February 2, 2000, EPA approved Maryland's 15% plan for the Baltimore severe 1-hour ozone nonattainment area. 65 FR 5252. Therefore, according to the Phase 2 Rule, the RFP plan for the Baltimore Area may use either NO_x or VOC emissions reductions (or both) to achieve the 15% emission reduction requirement.

Adjusted Base Year Inventory, 2008 RFP Target Levels

Maryland sets out its calculations for the adjusted base year inventory and 2008 RFP target levels in Section 5 of Maryland's Serious Area Plan. EPA previously approved 2008 RFP for the Baltimore Area. See 75 FR 31709 (June 4, 2010). EPA required MDE to update the 2008 target levels so that they could be used to calculate the 2011 and 2012 target levels in the Serious Area Plan. In the TSD prepared for this rulemaking action, EPA reviewed the 2008 target levels calculations in the Serious Area Plan, summarized in Table 2, and determined that they were done correctly and are approvable.

Table 2. Baltimore Area 2008 RFP Target Level Calculations (Ozone Season tpd)

Description		Formula	VOC	NO _x
A	2002 Adjusted Base Year Inventory Relative To 2008		258.69	369.69
B	RFP Ratio		0.0800	0.0700
C	Emissions Reductions Required Between 2002 & 2008	A * B	20.70	25.88
D	Target Level for 2008	A - C	238.00	343.81

Projected 2008 Inventories and Determination of RFP

Maryland describes its methods used for developing its 2008 projected VOC and NO_x inventories in Section 4 and Appendix A of the Serious Area Plan. Projected controlled 2008 emissions for the Baltimore Area are summarized in Table 4-5 of the Serious Area Plan, and are presented in Table 3. EPA reviewed the procedures Maryland used to develop its projected inventories and found them to be reasonable. For more information, please see the Baltimore Serious Area Emissions Inventory TSD.

Table 3. Baltimore Area 2008 Projected Controlled VOC and NO_x Emissions (Ozone Season tpd)

Source Category	VOC Emissions	NO _x Emissions
Point	15.63	122.64
Area	108.17	8.43
Non-road	44.04	42.85
Mobile	50.12	125.69
Total	217.96	299.62

To determine if 2008 RFP is met in the Baltimore Area, the total projected controlled emissions must be compared to the 2008 target levels. As shown in Table 4, the Serious Area Plan demonstrates that sufficient emission reductions occurred between 2002 and 2008 to meet the 2008 RFP target levels.

Table 4. Comparison of the 2008 RFP Measure Target Levels versus Projected Controlled Emissions in the Baltimore Area (Ozone Season tpd)

Description		VOC Emissions	NO _x Emissions
A	Total 2008 Projected Controlled Emissions	217.96	299.62
B	Target Level for 2008	238.00	343.81
RFP is met if A < B		Yes	Yes

2011 and 2012 RFP Target Levels and Determination of RFP

In the TSD prepared for this rulemaking action, EPA reviewed the 2011 and 2012 target levels calculations in the Serious Area Plan, summarized in Table 5, and determined that they were done correctly and are approvable.

Table 5. Baltimore Area 2011 & 2012 RFP Target Level Calculations (Ozone Season tpd)

2011 Target				
Description		Formula	VOC	NO _x
A	2008 Adjusted Base Year Inventory Relative To 2011		237.71	343.81
B	RFP Ratio		0.0600	0.0300
C	Emissions Reductions Required Between 2008 & 2011	A * B	14.28	10.31
D	Target Level for 2011	A - C	223.72	333.49
2012 Target				
Description		Formula	VOC	NO _x
A	2011 Adjusted Base Year Inventory Relative To 2012		223.73	333.32
B	RFP Ratio		0.0150	0.0150
C	Emissions Reductions Required Between 2011 & 2012	A * B	3.36	5.00
D	Target Level for 2012	A - C	220.38	328.49

Projected 2011 and 2012 Inventories and Determination of RFP

Projected controlled 2011 and 2012 emissions for the Baltimore Area are summarized in the Serious Area Plan, in Tables 4-6 and 4-7, respectively. That data is presented in Table 6.

Table 6. Baltimore Area 2011 and 2012 Projected Controlled VOC & NO_x Emissions (Ozone Season tpd)

Source Category	2011		2012	
	VOC Emissions	NO _x Emissions	VOC Emission	NO _x Emissions
Point	16.79	95.21	17.19	94.79
Area	106.07	8.54	106.79	8.56
Non-road	38.26	38.12	35.69	36.05
Mobile	44.54	104.62	40.23	93.47
Total	205.65	246.48	199.90	232.88

As shown in Table 7, the Serious Area Plan demonstrates that sufficient emission reductions occurred between 2008 and 2011 and between 2011 and 2012 to meet the 2011 and 2012 RFP target levels. Therefore, the Serious Area Plan demonstrates 2011 and 2012 RFP in the Baltimore Area.

Table 7. Comparison of the 2011 and 2012 RFP Measure Target Levels versus Projected Controlled Emissions in the Baltimore Area (Ozone Season tpd)

2011 RFP			
Description		VOC Emissions	NO _x Emissions
A	Total 2011 Projected Controlled Emissions	205.65	246.48
B	Target Level for 2011	223.72	333.49
RFP is met if A < B		Yes	Yes
2012 RFP			
Description		VOC Emissions	NO _x Emissions
A	Total 2012 Projected Controlled Emissions	199.90	232.88
B	Target Level for 2012	220.38	328.49
RFP is met if A < B		Yes	Yes

Table 8 summarizes the emission reductions achieved by each measure, as calculated by Maryland in the Serious Area Plan.

Table 8. Summary of RFP Emission Reductions (tpd)

Control Measure	2008		2011		2012	
	VOC	NO _x	VOC	NO _x	VOC	NO _x
Mobile Onroad						
MOVES model	52.86	158.43	62.23	181.35	66.59	192.33
Area						
OTC - Consumer Products Phase 1	3.70	0.00	3.77	0.00	3.79	0.00
OTC - Consumer Products Phase 2	0.00	0.00	0.46	0.00	0.46	0.00
OTC - AIM	6.03	0.00	6.19	0.00	6.19	0.00
OTC - PFC Phase 1	6.71	0.00	8.31	0.00	8.35	0.00
OTC - PFC Phase 2	0.00	0.00	0.60	0.00	0.60	0.00
OTC - Industrial Adhesives	0.00	0.00	2.63	0.00	2.64	0.00
Total Area reductions	16.44	0.00	21.96	0.00	22.03	0.00
Nonroad						
Nonroad Model	17.85	8.12	26.33	14.55	29.83	17.30
Railroads (Tier 2)	0.00	1.18	0.00	1.58	0.00	1.67
Point						
Healthy Air Act (HAA)	0.00	0.00	0.00	31.86	0.00	37.18
Total	87.14	167.73	110.51	229.35	118.45	248.48

Projected emissions for both VOC and NO_x are well below the RFP target levels, as shown in Table 9. Therefore, the Serious Area Plan demonstrated more than sufficient emission reductions to meet RFP for 2008, 2011, and 2012, and the RFP plan is approvable.

Table 9. Comparison of RFP Targets and Projected Controlled Emissions for the Baltimore Area (tpd)

Description		2008		2011		2012	
		VOC	NO _x	VOC	NO _x	VOC	NO _x
A	Projected Controlled Emissions	217.96	299.62	205.65	246.48	199.90	232.88
B	Target Level	238.00	343.81	223.72	333.49	220.38	328.49
RFP is met if A < B		Yes	Yes	Yes	Yes	Yes	Yes

Contingency Measures for Failure to Meet RFP

EPA's May 26, 2015 determination that the Baltimore Area attained the 1997 8-hour ozone NAAQS suspends certain planning requirements, including contingency measures, for the 1997 8-hour ozone NAAQS for as long as the area continues to meet that NAAQS. Considering the most recent ambient air quality monitoring data, the Baltimore Area continues to meet the 1997 8-hour NAAQS. Therefore, no contingency measures are required. EPA is proposing to approve the RFP contingency measures along with the serious area RFP plan containing in the Serious Area Plan, as SIP strengthening measures, as requested by MDE.

See Tables 10 and 11 for contingency target level calculations and EPA's evaluation of the 2012 RFP contingency measure requirement.

Table 10. 2012 RFP Contingency Measure Target Level Calculations

Description		Formula	VOC	NO _x
A	2011 Target Level		223.73	333.49
B	FMVCP/RVP Reductions Between 2011 And 2012		0.00	0.18
C	2011 Adjusted Base Year Inventory Relative To 2012	A - B	223.73	333.32
D	RFP Ratio		0.0150	0.0150
E	Emissions Reductions Required Between 2011 & 2012	C * D	3.36	5.00
F	RFP Target Level for 2012	C - E	220.38	328.49
G	Contingency, 1.5% VOC & NO _x	0.015 * C	3.36	5.00
H	2012 Contingency Target Level	F - G	217.02	323.49

Table 11. Comparison of the 2012 RFP Contingency Measure Target Levels versus Projected Controlled Emissions (tpd)

Description		VOC	NO _x
A	Projected Controlled Emissions	199.90	232.88
B	Contingency Target Level	217.02	323.49
Contingency Requirement is met if A < B		Yes	Yes

As shown in Table 11, the Serious Area Plan achieved more than enough emission reductions to meet the contingency measure requirement for the 2012 milestone year for the Baltimore Area.

Motor Vehicle Emissions Budgets

The MVEBs which EPA has determined to be adequate are identical to the projected controlled 2012 on-road mobile source emissions for the Baltimore Area in the Serious Area Plan. In addition to the budgets being adequate for transportation conformity purposes, EPA found the procedures Maryland used to develop the MVEBs to be reasonable. Because the 2012 RFP MVEBs are adequate for transportation conformity purposes and the methods MDE used to develop them are correct, the 2012 RFP MVEBs are approvable.

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