

Region 3 Plan Summary
Metropolitan Baltimore Ozone Nonattainment Area

Title: Post-1996 Rate of Progress (ROP) Plan for the Metropolitan Baltimore Ozone Nonattainment Area

Federal Register Dates: August 6, 2001, 66 FR 40947 (proposed rule); September 26, 2001, 66 FR 49108 (final rule)

EPA Approval/Effective date: October 26, 2001

State Submittal Dates: December 24, 1997; additional revisions submitted on April 24, 1998, August 18, 1998, December 21, 1999, December 28, 2000, and July 2, 2001.

Affected Areas: Anne Arundel, Baltimore, Carroll, Harford, and Howard Counties; Baltimore City

Summary of the Plan: On December 24, 1997, Maryland submitted a SIP revision for the Phase I plans for the Baltimore nonattainment area containing the first 9 percent ROP demonstration for the 1999 milestone year and corrections to the 1990 base year emissions inventory. The April 24, 1998 and August 18, 1998 submittals contain the ROP demonstrations for milestone years 2002 and 2005 for both areas. The December 21, 1999 submittal revises the motor vehicle emissions budgets (MVEBs) for the Baltimore nonattainment area for the ROP milestone years 2002 and 2005. The December 28, 2000 submittal revises the Baltimore ROP demonstrations for the milestone years 2002 and 2005. EPA requested additional technical support documentation from Maryland, which the State submitted on July 2, 2001. This information includes:

- (1) rule effectiveness adjustments to several stationary source control measures;
- (2) adjustments to the VOC and NO_x target levels for 1999, 2002 and 2005 to account for the application of rule effectiveness on certain stationary source control measures; and
- (3) revisions to the emission reduction benefits from Maryland's auto body refinishing rule, NO_x RACT rule, NO_x budget rule and NO_x SIP Call rule. The revised emission reduction benefits reflect the final state-adopted regulations for these control programs.

Emission Inventories:

Table 1: Baltimore Area VOC Target Levels in Tons Per Day

	1999	2002	2005
1990 Base Year Inventory	523.3	523.3	523.3
(Minus biogenic emissions)	(-180.0)	(-180.0)	(-180.0)

1990 Rate of Progress Base Year Inventory	343.3	343.3	343.3
(Minus non-creditable FMVCP/RVP)	(- 44.5)	(-48.0)	(-49.2)
1990 Adjusted Base Year Inventory	298.8	295.3	294.1
ROP Percentage Reduction	*.15%	*2.5%	*3.5%
ROP Emission Reductions	.45	7.38	10.29
Fleet Turnover Correction	0.0	3.5	1.2
Target Level from Previous Milestone Year	253.3	252.85	241.97
(Minus Emission Reduction Requirement)	(-.45)	(-7.38)	(-10.29)
(Minus Fleet Turnover Correction)	(-0.0)	(-3.5)	(-1.2)
Target Level	252.85	241.97	230.48

Table 2: Baltimore Area NOx Target Levels in Tons Per Day

	1999	2002	2005
1990 Base Year Inventory	467.9	467.9	467.9
(Minus non-creditable FMVCP/RVP)	(-32.3)	(-35.0)	(-35.4)
1990 Adjusted Base Year Inventory	435.6	432.9	432.5
ROP Percentage Reduction	*8.85%	*6.5%	*5.5%
ROP Emission Reductions	38.55	28.14	23.79
Fleet Turnover Correction	32.3	2.7	0.4
Target Level from Previous Milestone Year	467.9	397.05	366.21
(Minus Emission Reduction Requirement)	(-38.55)	(-28.14)	(-23.79)
(Minus Fleet Turnover Correction)	(-32.3)	(-2.7)	(-0.4)
Target Level	397.05	366.21	342.02

Table 3: Baltimore Projected (Uncontrolled) VOC Emissions in Tons Per Day

Source Category	1990 VOC Baseline	1999 VOC Projected	2002 VOC Projected	2005 VOC Projected
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Point	42.0	48.1	51.4	54.2
Mobile	134.2	108.7	105.3	106.1
Nonroad	44.7	50.9	53.37	55.76
Area	122.4	128.7	130.5	132.2
Total	343.3	336.4	340.57	348.26

Table 4: Baltimore Projected (Uncontrolled) NOx Emissions in Tons Per Day

Source Category	1990 NOx Baseline	1999 NOx Projected	2002 NOx Projected	2005 NOx Projected
Point	223.2	240.6	247.5	251.9
Mobile	159.5	157.1	169.6	173.8
Nonroad	71.5	82.0	86.65	91.84
Area	13.7	14.8	15.1	15.4
Total	467.9	494.50	518.85	532.94

Control Measures/Regulations Included As Part of the Plan (tons per day)and Expected Emissions Reductions

Control Measure	1999 VOC Reduction	1999 NOx Reduction	2002 VOC Reduction	2002 NOx Reduction	2005 VOC Reduction	2005 NOx Reduction
Open Burning	2.91	0.61	2.91	0.61	2.91	0.61
AIM Coatings	5.49		5.52		5.55	
Consumer Products	2.72		2.78		2.83	
Autobody Refinishing	7.48		7.79		8.07	
Surface Cleaning/degreasing	5.79		5.78		5.76	
Landfills	0.1		0.24		0.27	
VOC RACT - Expandable polystyrene	0.09		0.09		.10	

Control Measure	1999 VOC Reduction	1999 NO _x Reduction	2002 VOC Reduction	2002 NO _x Reduction	2005 VOC Reduction	2005 NO _x Reduction
VOC RACT - Yeast facilities	0.75		0.81		0.87	
VOC RACT - Commercial Bakeries	0.68		0.71		0.72	
VOC RACT - Screen Printing	0.18		0.19		0.2	
Flexographic and rotogravure printers	0.86		0.88		0.9	
Lithographic printers	2.46		2.61		2.66	
Federal Air Toxics	0.5		0.5		0.5	
State Air Toxics	0.88		0.88		0.96	
Enhanced Rule Compliance	4.7		4.9		5.1	
Nonroad Heavy Duty Diesel		4.7		10.96		16.13
Nonroad Small Gas Engines	6.1	(-0.3)	9.69	(-0.37)	17.51	(-0.45)
Marine engine standards			0.86	(-0.01)	1.79	(-0.07)
Locomotive Engines				2.42		4.2
NO _x RACT		4.83		4.93		5.01
NO _x Point Sources - Phases II and III		87.2		109.74		128.2
Gasoline Vapor Recovery	8.1		9.0		10.0	
Mobile Source control programs ¹	33.8	32.8	51.2	56.7	57.4	69.5

¹Mobile source control programs include the total amount of emission reductions associated with enhanced I/M, Tier 1 emission standards, reformulated gasoline, NLEV, and highway heavy duty engine standards. EPA's MOBILE5b emissions model was used to generate the combined emission reductions from these programs.

Control Measure	1999 VOC Reduction	1999 NO _x Reduction	2002 VOC Reduction	2002 NO _x Reduction	2005 VOC Reduction	2005 NO _x Reduction
Total	83.6	129.9	107.3	184.98	124.1	223.1

VOC Reductions from Air Toxics Sources in the Baltimore Area in Tons Per Day

Company	Emission Reduction by 2005
American Cyanamid	0.006
Quebecor	0.98
Sweetheart Cup	0.12
Vista	0.05

Mobile Source Emission Reductions in the Baltimore Area in Tons Per Day

	1999	2002	2005
VOC	33.8	51.2	57.4
NO_x	32.8	56.7	69.5

Baltimore Area ROP Demonstration in Tons Per Day

	1999 VOC	1999 NO _x	2002 VOC	2002 NO _x	2005 VOC	2005 NO _x
Projected Uncontrolled Emissions (includes growth)(refer to tables 3 and 4)	336.4	494.5	340.6	518.9	348.3	532.9
Reductions From Creditable Emission Control Measures (refer to table 7)	83.6	129.9	107.3	184.98	124.1	223.1
Emissions Level Obtained (uncontrolled emissions minus emission reductions)	252.8	364.6	233.3	333.9	224.2	309.8
Projected Target Levels (refer to tables 1 and 2)	252.85	397.05	241.97	366.21	230.48	342.02

	1999 VOC	1999 NOx	2002 VOC	2002 NOx	2005 VOC	2005 NOx
Surplus Emission Reductions (target levels minus emissions obtained)	.05	32.45	8.67	32.31	6.28	32.22

Motor Vehicle Emissions Budget (tons per day)

	VOC	NOx
1999	69.8	115.7
2002	54.0	112.6
2005	48.6	104.1

Contingency Measures:

The three percent contingency requirement is based on the adjusted base year inventory for the area. States must be able to demonstrate at least a three percent contingency for all ROP milestone years, in this case for 1999, 2002 and 2005. The contingency requirement in the Baltimore nonattainment area is based on the VOC adjusted base year inventory (refer to Table 2 of this document) for each of the ROP milestone years:

1999 adjusted base year inventory (298.8 tpd) x 3% = 8.96 tpd

2002 adjusted base year inventory (295.3 tpd) x 3% = 8.86 tpd

2005 adjusted base year inventory (294.1 tpd) x 3% = 8.82 tpd

In the Baltimore ROP demonstration, Maryland outlines its approach for using already implemented control measures for contingency purposes. The EPA encourages the early implementation of required control measures and of contingency measures as a means of guarding against failure to meet a milestone or to attain. EPA allows for the substitution of NOx emission reductions for VOC in contingency plans, provided NOx reductions are necessary for attainment. Contingency measures could provide for less than three percent in VOC reductions as long as some of the measures are for VOC and the area would have the difference, up to three percent, in NOx reductions. With the inclusion of NOx control measures in the Baltimore ROP plan, Maryland has adopted more emission control programs than is necessary to demonstrate ROP. These extra or surplus emission reductions are shown above.

Maryland's plan for the Baltimore nonattainment area shows an adequate amount of emission

reductions have occurred beyond those required for ROP, and therefore, any surplus emission reductions can be considered as early implementation of contingency measures. Maryland has also adopted control measures that are not required in the nonattainment area by the Act, including the open burning ban, enhanced rule compliance, NLEV and the OTC NO_x MOU program. Surplus emission reductions associated with these measures can be used as the early implementation of contingency measures.

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