

**DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF AIR AND WASTE MANAGEMENT**

Statutory Authority: 7 Delaware Code, Section 901(b) and 903(e)(2)a (7 Del.C. §901(b) §903(e)(2)a)
7 DE Admin. Code 3553

FINAL

Secretary's Order No.: 2012-A-0002

Proposed Revision to Delaware's 2008 State Implementation Plan For Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard - Attainment Demonstration

Date of Issuance: January 17, 2012

Effective Date of the Amendment: February 11, 2012

Under the authority vested in the Secretary of the Department of Natural Resources and Environmental Control ("Department" or "DNREC") the following findings, reasons and conclusions are entered as an Order of the Secretary in the above-referenced rulemaking proceeding.

Background and Procedural History

This Order considers the proposed revision to the Delaware 2008 State Implementation Plan (SIP) for Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard. The purpose of this proposed revision is to (1) replace the on-road mobile emissions budget in the 2008 PM_{2.5} SIP with a budget that is based on the MOVES model; (2) demonstrate that the MOVES based mobile source budget is consistent with attainment of the PM_{2.5} NAAQS; and (3) demonstrate that the contingency requirements of the Clean Air Act (CAA) are met. The Department published its initial proposed revision to the aforementioned Delaware SIP in the December 1, 2011 *Delaware Register of Regulations*, and held a public hearing on December 28, 2011. It should be noted that no public comment was received by the Department with regard to this proposed promulgation, and no members of the public attended the hearing held by the Department in this matter.

On March 2, 2010, the U.S. Environmental Protection Agency ("EPA") published a notice in the Federal Register concerning the approval of utilization of the Motor Vehicle Emissions Simulator ("MOVES") model as a tool for calculation of on-road emissions. That EPA notice also established the beginning of a two-year transportation conformity grace period, which is scheduled to end on March 2, 2012. Subsequent to that date, MOVES is required to be used for new regional emissions analyses for transportation conformity. In consideration of the aforementioned MOVES requirement (and, due to the ability of the MOVES model to predict more accurate mobile emissions), the Department proposes to amend its current State Implementation Plan with a revised on-road mobile emissions budget which utilizes the MOVES model. With the adoption of this amended SIP, the Department will be able to more accurately calculate the on-road sector's portion of particulate matter and oxides of nitrogen emissions in New Castle County. This proposed action will also address the compatibility issue with future regional emissions analyses for transportation conformity for the annual PM_{2.5} standard.

The Department's presiding hearing officer, Lisa A. Vest, prepared a Hearing Officer's Report dated January 5, 2012 (Report). The Report recommends certain findings and the adoption of the proposed revisions to Delaware's 2008 State Implementation Plan, as attached to the Report as Appendix A.

Findings and Discussion

I find that the proposed revision to Delaware's aforementioned SIP is well-supported by the record developed by the Department, and I adopt the Report to the extent it is consistent with this Order. The Department's experts developed the record and drafted the proposed SIP revision.

I find that the Department's experts in the Division of Air Quality fully developed the record to support adoption of the proposed revision to the Delaware 2008 State Implementation Plan (SIP) for Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard. With the adoption of this Order, Delaware will (1) replace the on-road mobile emissions budget in the 2008 PM_{2.5} SIP with a budget that is based on the MOVES model; (2) demonstrate that the MOVES based mobile source budget is consistent with attainment of the PM_{2.5} NAAQS; and (3) demonstrate that the contingency requirements of the Clean Air Act (CAA) are met.

In conclusion, the following findings and conclusions are entered:

- 1.) The Department has jurisdiction under its statutory authority to issue an Order adopting this proposed SIP revision as final;
- 2.) The Department provided adequate public notice of the proposed SIP revision, and provided the public with an

adequate opportunity to comment on the proposed SIP revision, including at the public hearing held on December 28, 2011;

3.) The Department held a public hearing on December 28, 2011 in order to consider public comment before making any final decision;

4.) The Department's Hearing Officer's Report, including its recommended record and the recommended SIP revision, as set forth in Appendix A, is adopted to provide additional reasons and findings for this Order;

5.) The recommended revision to Delaware's 2008 State Implementation Plan (SIP) for Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard should be adopted as final, because Delaware will be able to (1) replace the on-road mobile emissions budget in the 2008 PM_{2.5} SIP with a budget that is based on the MOVES model; (2) demonstrate that the MOVES based mobile source budget is consistent with attainment of the PM_{2.5} NAAQS; (3) demonstrate that the contingency requirements of the Clean Air Act (CAA) are met; and, lastly, because (4) the revision is well supported by documents in the record;

6.) The Department shall submit this Order approving the final revision to Delaware's 2008 State Implementation Plan (SIP) for Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard to the *Delaware Register of Regulations* for publication in its next available issue, and provide such other notice as the law and regulation require and the Department determines is appropriate.

Collin P. O'Mara, Secretary

Proposed Revision to Delaware's 2008 State Implementation Plan For Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard - Attainment Demonstration

October 2011

Section 1. Introduction

In April, 2008 Delaware submitted to the EPA its "*State Implementation Plan for Attainment of the PM_{2.5} Annual National Ambient Air Quality Standard - Attainment Demonstration*" (the "2008 PM_{2.5} SIP").¹ The 2008 PM_{2.5} SIP set out to accomplish four primary goals:

- Demonstrate that with all existing and proposed controls, all of Delaware's PM_{2.5} monitors will show attainment in 2009.
- Demonstrate that the entire Philadelphia-Wilmington, PA-NJ-DE non-attainment area will attain the annual PM_{2.5} NAAQS in 2009.
- Establish Delaware's 2009 mobile source budgets for transportation conformity determinations under Regulation No. 1132, Transportation Conformity.
- Treat emission reduction credits (ERCs) banked under 7 **DE Admin. Code** 1134, Emissions Banking and Trading Program, as "emitted." As such, the future use of these credits is consistent with, and will not interfere with any calculation or provision of this SIP.

This SIP revision is related to the PM_{2.5} and NO_x on-road mobile source budgets that were established in the 2008 PM_{2.5} SIP. Those SIP budgets were established using EPA's MOBILE6.2 model.² However, effective March 2012³ a new on-road mobile emissions model – Motor Vehicle Emissions Simulator (MOVES) – is required to be used in all planning and transportation conformity determinations.

The purpose of this SIP revision is to 1) replace the on-road mobile emissions budget in the 2008 PM_{2.5} SIP with a budget that is based on the MOVES model, 2) demonstrate that the MOVES based mobile source budget is consistent with attainment of the PM_{2.5} NAAQS by 2010, and 3) demonstrate that the contingency requirements of the Clean Air Act (CAA) are met. No other changes or revisions to the 2008 PM_{2.5} SIP are proposed.

Note that this SIP revision impacts only PM_{2.5} and NO_x emissions and calculations. While sulfur dioxide (SO₂) is a pollutant of concern relative to PM_{2.5} it is not a pollutant of concern for mobile budgets, and therefore no SO₂ changes are proposed as part of this SIP revision. The treatment of SO₂ emissions in the 2008 PM_{2.5} SIP is unchanged.

Questions or comments regarding this SIP revision should be addressed to Phil Wheeler, M.S. Project Leader for Transportation Conformity, Planning Branch, Division of Air Quality, Delaware Department of Natural Resources and Environmental Control, at philip.wheeler@state.de.us.

1. http://www.awm.delaware.gov/Info/Regs/Documents/DE_PM25_SIP_AD_fnl.pdf

2. Details of the MOBILE6 budget calculations are included in Section 8.2 of the 2008 PM_{2.5} SIP.

3. EPA has proposed to extend this date by one year; to March 2013.

Section 2. Revised On-Road Mobile Source Budgets

This SIP revision establishes on-road mobile emissions budget for New Castle County for PM_{2.5} and NO_x. When approved by the EPA, all subsequent PM_{2.5} conformity analyses will test future on-road mobile emissions calculated for transportation plans in New Castle County with this new budget.

- 2.1 EPA's MOVES model was used to quantify PM_{2.5} and NO_x emission from on-road mobile sources. These emissions are shown in Table 2-1 below. The associated 2012 MOVES input and output files are included in Appendix A of this SIP revision.

Table 2-1 On-Road Mobile Emission Budget (Tons per Year (tpy))

County	Emissions Budget	
	NO _x	PM _{2.5}
New Castle	6,273	199

- 2.2 This SIP revision establishes the emission levels identified in Table 2-1 as the on-road mobile emissions budget for New Castle County for PM_{2.5} and NO_x.

Section 3. Demonstration that 2009 MOVES based On-Road Mobile Source Emissions are Consistent with Attainment of the PM_{2.5} NAAQS by 2010

Delaware demonstrated attainment of the annual PM_{2.5} NAAQS in its 2008 PM_{2.5} SIP by showing that Projected 2009 Emissions (i.e., the 2009 emission levels after the implementation of all state and federal control requirements) were less than the Attainment Targets (i.e., the emission levels needed for attainment based on modeling). This same methodology is used below to demonstrate that the MOVES based mobile budgets presented in Section 2 above are consistent with attainment of the PM_{2.5} NAAQS.

- 3.1 Community Multi-scale Air Quality Model (CMAQ) modeling was conducted in the 2008 PM_{2.5} SIP to demonstrate that Delaware and the entire Philadelphia based non-attainment area would attain the PM_{2.5} NAAQS in 2010⁴. CMAQ modeling demonstrated that the Delaware emission levels shown in Table 3-1 are the levels that are necessary for, and consistent with attainment of the annual PM_{2.5} NAAQS. These emission levels reflect the level of emissions needed for attainment, and are therefore referred to as the "2009 Attainment Target."^{5, 6}

Table 3-1 2009 Attainment Target (tpy)

County	NO _x	PM _{2.5}
Kent	8,554	1,185
New Castle	23,048	3,249
Sussex	18,001	3,581
Statewide Total	49,603	8,015

- 3.2 Attainment year (i.e., 2009) emission levels were projected in the 2008 PM_{2.5} SIP based on final and enforceable State and Federal emission control requirements.⁷ These projected 2009 emission levels, which are referred to as the "Delaware Projected 2009 Emissions," are shown in Table 3-2.

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4. A detailed discussion of the CMAQ modeling and modeling results can be found in Section 6 of the 2008 PM_{2.5} SIP.
5. Although New Castle County is the only nonattainment county, emission levels of all three counties are used in the attainment demonstration. This is discussed in Sections 3 and 4 of this SIP revision.
6. A detailed discussion of the emission inventories associated with the Attainment Target can be found in Section 5 of the 2008 PM_{2.5} SIP.
7. A detailed discussion of Delaware's projected 2009 emission levels can be found in Section 4 of the 2008 PM_{2.5} SIP.

Table 3-2 Delaware Projected 2009 Emissions (tpy)

County	NOx	PM _{2.5}
Kent	7,799	989
New Castle	21,807	3,015
Sussex	11,591	2,571
Statewide Total	41,197	6,575

3.3 Table 3-3 compares the 2009 mobile emissions calculated using MOBILE6 and MOVES. The associated 2009 MOBILE6 and MOVES input and output files are included in Appendix B of this SIP revision.

Table 3-3 2009 MOBILE6, MOVES and Increase due to MOVES (tpy)

County	2009 Mobile6		2009 MOVES		MOVES Increase	
	NOx	PM _{2.5}	NOx	PM _{2.5}	NOx	PM _{2.5}
Kent	1,922	32	3,488	109	1,566	77
New Castle	4,904	87	8,448	257	3,544	170
Sussex	2,707	41	4,764	147	2,057	106
Totals	9,533	160	16,700	513	7,167	353

3.4 Adding the “MOVES Increase” emissions from Table 3-3 to the “Delaware Projected 2009 Emissions” from Table 3-2 yields a projected Delaware 2009 Emission level that reflects the use of the MOVES model instead of the MOBILE6 model. This revised emissions projection is shown in Table 3-4, and is referred to as the “Revised Delaware Projected 2009 Emissions.”

Table 3-4 Revised Delaware Projected 2009 Emissions (tpy)

County	NOx	PM _{2.5}
Kent	9,365	1,066
New Castle	25,351	3,185
Sussex	13,648	2,677
Statewide Total	48,364	6,928

3.5 The “Revised Delaware Projected 2009 Emissions” (i.e., Table 3-4) are demonstrated to be consistent with attainment if they are equal to or lower than the “2009 Attainment Target” (i.e., Table 3-1). The “Revised Delaware Projected 2009 emissions” are compared to the “Attainment Target” in Table 3-5 below.

Table 3-5 Shortfall and Surplus by County and Statewide (tpy)

County	Attainment Target		Revised Delaware Projected 2009 Emissions		Surplus/Shortfall	
	NOx	PM _{2.5}	NOx	PM _{2.5}	NOx	PM _{2.5}
Kent	8,554	1,185	9,365	1,066	-811	119
New Castle	23,048	3,249	25,351	3,185	-2,303	64
Sussex	18,001	3,581	13,648	2,677	4,353	904
Statewide	49,603	8,015	48,364	6,928	1,239	1,087

This comparison shows that there is a 64 tpy PM_{2.5} surplus in New Castle County, and a 2,303 tpy NOx shortfall for New Castle County. This demonstrates that, relative to direct PM_{2.5}, the MOVES based mobile budgets are consistent with attainment. These results also indicate that NOx requires further analysis.

3.6 Because of the regional nature of secondarily-formed sulfate and nitrate, and the broad modeling domain of the CMAQ modeling, which included all of Delaware, emission reductions from Kent and Sussex counties will contribute to attainment within New Castle County and the Philadelphia based non-attainment area. Kent and Sussex counties are within the State of Delaware, contiguous to New Castle County, and are less than 200 kilometers away. EPA's PM_{2.5} Implementation Rule specifically provides for the consideration of in-state NO_x and SO₂ reductions in their SIPs from sources up to 200 kilometers away from the non-attainment area boundaries.⁸

Consistent with this EPA rule, emissions from Kent and Sussex Counties were analyzed. Using the same methodology as above, statewide emissions are calculated and presented in Table 3-5. These results indicate that while there is a 2009 NO_x shortfall of 2,303 tpy in New Castle County, there is a statewide NO_x surplus of 1,239 tpy. The analysis demonstrates that the 2009 MOVES based emission shown in Table 3-3 do not impair Delaware's ability to meet its SIP emissions targets or meeting EPA's National Ambient Air Quality Standards for particulate matter.⁹

Section 4. Demonstration that the Contingency Measure Requirements of the CAA are Met

Contingency measures are additional control measures to be implemented in the event that an area fails to either meet "reasonable further progress" or attain the standards by its attainment date. The quantity of emission reductions needed to satisfy contingency requirements is an amount equal to one year's worth of required reductions.

Delaware demonstrated that the contingency requirements of the CAA were met in Section 9 of its 2008 PM_{2.5} SIP by showing that the Delaware control measures have reduced NO_x and primary PM_{2.5} by more than is necessary to attain compliance with the PM_{2.5} NAAQS. This same methodology is used below to demonstrate that the "*Revised Delaware Projected 2009 Emissions*" in Table 3-4 are low enough to satisfy contingency requirements.

4.1 Quantification of the contingency requirement is discussed in detail in Section 9.1 of the 2008 PM_{2.5} SIP. The contingency requirement for NO_x and PM_{2.5} is presented in Table 9-3 of the 2008 PM_{2.5} SIP, and shown below in Table 4-1.

Table 4-1 Contingency Requirement (tpy)

County	NO _x	PM _{2.5}
New Castle	1,100	26

4.2 Demonstration that contingency requirement is met is shown if the "*Revised Delaware Projected 2009 Emissions*" shown in Table 3-4 are lower than the "*Attainment Target*" shown in Table 3-1 by at least the amount of the amount of the contingency requirement shown in Table 4-1. Table 3-5 shows this calculation. Table 3-5 shows that a 64 tpy reduction of PM_{2.5} emissions are above and beyond that necessary for attainment. Since 64 tpy is greater than the contingency requirement of 26 tpy PM_{2.5}, the contingency requirement is demonstrated relative to the pollutant primary PM_{2.5}. Table 3-5 also indicates that NO_x requires further analysis.

4.3 Because of the regional nature of secondarily-formed sulfate and nitrate, and the broad modeling domain of the CMAQ modeling, which included all of Delaware, emission reductions from Kent and Sussex counties will contribute to attainment within New Castle County and the Philadelphia based non-attainment area. Kent and Sussex counties are within the State of Delaware, contiguous to New Castle County, and are less than 200 kilometers away. EPA's PM_{2.5} Implementation Rule specifically provides for the consideration of in-state NO_x and SO₂ reductions in their SIPs from sources up to 200 kilometers away from the non-attainment area boundaries.

Consistent with this EPA rule, emissions from Kent and Sussex Counties were analyzed. Using the same methodology as above, statewide emissions are calculated and presented in Table 3-5. This indicates that while there is a 2009 NO_x shortfall of 2,303 tpy in New Castle County, there is a statewide NO_x surplus of 1,239 tpy. Since 1,239 tpy is greater than the contingency requirement of 1,100 tpy NO_x, the contingency requirement is demonstrated as met relative to the pollutant NO_x.

8. PM_{2.5} Implementation Rule, April 25, 2007 (72 FR 20586 at 20636)

9. Note that this is similar to the approach used in the 2008 PM_{2.5} SIP to address SO₂ emissions. See Section 5 (page 65) of the 2008 PM_{2.5} SIP.

Section 5. Summary

The analysis in Section 3 and Section 4 above demonstrates that 2009 MOVES based emission levels in table 3-3 are consistent with attainment and the contingency requirements of the CAA. This SIP revision is anticipated to be approved by the EPA in 2012. Because the 2012 based mobile budgets established in Section 2 of this SIP revision are less than the 2009 MOVES based emission levels shown in Table 3-3, Section 3 and Section 4 above also demonstrate that mobile budgets established in Section 2 are consistent with attainment and contingency requirements of the CAA.

Appendix A. 2012 MOVES input and output files

Appendix B. 2009 MOVES and 2009 MOBILE6 Input and Output Files

Appendices A and B may be viewed by request to Philip Wheeler, Division of Air Quality during normal business hours at the Division's office at 655 South Bay Road, Suite 5N, Dover, Delaware, Delaware, 19901. Appointments can be made by calling 302/739-9402.

They also can be viewed on the Division of Air Quality website at:

<http://www.dnrec.delaware.gov/whs/awm/Info/Regs/Pages/AQMPlansRegs.aspx>.

15 DE Reg. 1171 (02/01/12) (Final)