

Region III Plan Summary
Pennsylvania Portion of the Philadelphia-Wilmington, Pennsylvania-New Jersey-Delaware
1997 Fine Particulate Matter Nonattainment Area

Title: Attainment Demonstration of the 1997 Fine Particulate Matter for the Philadelphia Portion of the Pennsylvania-New Jersey-Delaware Nonattainment Area

Federal Register Dates: November 2, 2011, 76 FR 67640 (Proposed Rule); August 28, 2012, 77 FR 51930 (Final Rule). **Revised:** February 15, 2013, 78 FR 11122 (Proposed Rule); April 3, 2013 (78 FR 19991).

EPA Effective date: September 27, 2012; Revised, effective April 3, 2013.

State Submittal Date: April 12, 2010

Affected Area: Philadelphia Area (Bucks, Chester, Delaware, Montgomery, and Philadelphia Counties)

Summary of the Plan

On April 12, 2010, the Pennsylvania Department of Environmental Protection (PADEP) submitted a State Implementation Plan (SIP) revision to demonstrate attainment of the 1997 annual fine particulate matter (PM_{2.5}) national ambient air quality standard (NAAQS) for the Pennsylvania portion of the Philadelphia-Wilmington, Pennsylvania-New Jersey-Delaware (PA-NJ-DE) nonattainment area (Philadelphia Area). This plan (herein called the “attainment plan”) includes Philadelphia Area’s attainment demonstration and motor vehicle emission budgets (MVEBs) used for transportation conformity purposes. The attainment demonstration includes an analysis of reasonably available control measures (RACM) and reasonably available control technology (RACT), a base year emissions inventory, and contingency measures. The requirement for a reasonable further progress (RFP) plan is not required because Pennsylvania projected that attainment of the 1997 PM_{2.5} NAAQS would have occurred in the Philadelphia Area by the attainment date, April 2010.

Emission Inventories

The emissions inventory for the base year, 2002, was developed in accordance with EPA guidance, “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards and Regional Haze Regulations, EPA-454/R-05-001, August 2005, updated November 2005.” Table 1 summarizes the emissions for 2002.

Table 1. 2002 Annual Emissions (Tons per Year)

Philadelphia area 2002	PM_{2.5}	PM₁₀	SO₂	NO_x	VOC	NH₃
Stationary Point Sources	2139	3430	23745	22124	8183	256
Area Sources	10020	55224	13153	13029	59227	4821
Highway Vehicle Sources	1033	1492	1920	63476	33974	2614
Nonroad Sources	1535	1611	1640	21619	21589	14
Total	14727	61758	40459	120248	122973	7705

Modeling

In the April 12, 2010 SIP revision, the photochemical grid model used projected emissions for 2009, including emission changes due to regulations Philadelphia and its neighboring states were planning to implement and expected growth by 2009. Meteorological conditions from 2002, the same as the base year modeling, were used in the projection modeling for 2009. Using the base case meteorology allows the effect of changes in states' emissions to be determined without being influenced by yearly fluctuations in meteorology and is consistent with EPA guidance.

The conceptual model (describes how weather patterns affect the formation and transport of PM_{2.5}, accounting for emissions and photochemistry) for the Philadelphia Area's attainment plan is described in a document prepared by the Northeast States for Coordinated Air-Use Management (NESCAUM) final report entitled, "The Nature of the Fine Particle and Regional Haze Air Quality Problems in the MANE-VU Region: A Conceptual Description (2006)." This document is consistent with EPA's guidance and was prepared for use by the Ozone Transport Commission (OTC) member states which provides the conceptual description of PM_{2.5} issues in the OTC states. The OTC is a multi-state organization consisting of the States of Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Northern Virginia. By agreement of OTC, the New York State Department of Environmental Conservation (NYSEC) ran the Community Multi-scale Air Quality Model (CMAQ) for the states in the northeast Ozone Transport Region (OTR) which includes Philadelphia.

The attainment test for PM_{2.5} is referred to as the Speciated Modeled Attainment Test (SMAT). In the Philadelphia Area's April 12, 2010 SIP revision, the SMAT results demonstrated that the projected annual arithmetic mean PM_{2.5} concentration calculated at each Federal Reference Method (FRM) monitor attained the annual PM_{2.5} NAAQS. Specifically, all calculations are less than 15µg/m³.

In summary, the basic photochemical grid modeling, presented in the Philadelphia Area attainment plan, used the methods recommended in EPA's modeling guidance. When EPA's attainment test is applied to the modeling results, the 2009 annual-average PM_{2.5} design value is predicted to be 13.5µg/m³ in the Philadelphia Area. Therefore, based on EPA's modeled

attainment test, the Philadelphia Area reached attainment of the annual average PM_{2.5} standard in 2009 before the attainment date of April 5, 2010.

RACM/RACT Analysis

On August 3, 2012, Michael L. Krancer, Secretary of PADEP sent a letter to Shawn M. Garvin, Regional Administrator of EPA Region III withdrawing the analysis of RACM/RACT which had been included in the April 12, 2010 attainment plan since the requirement for the RACM/RACT analysis was suspended by the May 16, 2012 (77 FR 28782) clean data determination pursuant to 40 CFR 51.1004(c).

Contingency Measures

EPA determined on May 16, 2012 (77 FR 28782) that the Philadelphia Area attained by its required attainment date in accordance with section 179(c)(9) of the CAA, no contingency measures for failure to attain by this date need to be implemented, and further EPA action respecting nonattainment contingency measures is unnecessary. Furthermore, as set forth in the PM_{2.5} Implementation Rule, areas that attained the NAAQS by the attainment date are considered to have satisfied the requirement to show RFP, and as such do not need to implement contingency measures to make further progress to attainment. EPA has determined that the Philadelphia Area attained by the attainment date, therefore the contingency measures submitted by Pennsylvania are no longer necessary for the Philadelphia Area to meet RFP requirements or to attain the 1997 annual PM_{2.5} NAAQS by the attainment date.

Motor Vehicle Emissions Budgets (Revised 4/3/2013)

The motor vehicle emissions budgets (MVEBs) for the 2009 attainment year are calculated using the MOVES2010 model, which is EPA's current model for determining transportation conformity analyses. MOVES2010 replaces the MOBILE6.2 model. The new data has allowed EPA to better understand on-road mobile source emissions and their contribution to emissions inventories as well as the effectiveness of different control strategies. Pennsylvania DEP utilized MOVES2010a to provide emissions rates for emissions of PM_{2.5} as well as for precursor emissions. The precursors for PM_{2.5} include volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur dioxide (SO₂) and ammonia (NH₃). The approved attainment demonstration is based on NO_x being the only significant PM_{2.5} precursor from on-road sources; therefore, the attainment demonstration and this SIP revision establish budgets for NO_x and PM_{2.5}.

The MVEBs for 2009 attainment year for the Philadelphia Area are 1,907.5 tons per year for PM_{2.5} direct and 57,218.3 tons per year for NO_x. Even though the emissions results produced by MOVES2010a are greater than those previously calculated using MOBILE6.2, these higher emissions are a result of improvements in the MOVES model rather than from unanticipated growth or changes in control measures. The MOVES results are more accurate estimates of the emissions that actually occurred in 2002 and 2009, rather than an indication that emissions are

increasing. More importantly, the Philadelphia Area attained the 1997 PM2.5 NAAQS in 2009 and continues to attain that NAAQS now with emissions that are being released from all sources.

EPA Region III Contact: Rose Quinto (3AP30), U.S. EPA Region III
1650 Arch Street, Philadelphia, PA 19103-2029
(215) 814-2182; quinto.rose@epa.gov