6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R03-OAR-2020-0157; FRL-10010-42-Region 3]

Air Plan Approval; Pennsylvania; Allegheny County Area Attainment Plan for the 2012 Fine Particulate Matter National Ambient Air Quality Standard

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to approve elements of a state implementation plan (SIP) revision submitted by the Pennsylvania Department of Environmental Protection (PADEP) on behalf of the Allegheny County Health Department (ACHD) to address Clean Air Act (CAA or "the Act") requirements for the 2012 annual fine particulate matter ($PM_{2.5}$) national ambient air quality standards (NAAQS or "standards") in the Allegheny County Moderate $PM_{2.5}$ nonattainment area ("Allegheny County area"). The SIP revision contains the "Attainment Demonstration for the Allegheny County, PA $PM_{2.5}$ Nonattainment Area, 2012 NAAQS," submitted on September 30, 2019 (also referred to as "the Allegheny County $PM_{2.5}$ Plan" or simply "the plan"). EPA is proposing to fully approve the following elements of the Allegheny County $PM_{2.5}$ Plan: The base year emissions inventory, the particulate matter precursor contribution demonstration, the reasonably available control measures/reasonably available control technology (RACM/RACT) demonstration, the attainment demonstration, the air quality modeling demonstration supporting attainment by the attainment deadline, the reasonable further progress (RFP) demonstration, and the a demonstration of interim quantitative milestones to ensure timely attainment. EPA is proposing to conditionally approve

the following elements of this Allegheny County $PM_{2.5}$ Plan SIP revision: The contingency measures and the motor vehicle emission budget (MVEB) elements of the plan. PADEP commits, on behalf of ACHD, to submit a supplemental SIP revision to remedy those portions of the plan for which EPA is proposing conditional approval within twelve months of EPA's final conditional approval action. This action is being taken under the CAA.

DATES: Written comments must be received on or before **[insert date 30 days after date of publication in the Federal Register]**.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-R03-OAR-2020-0157 at https://www.regulations.gov, or via email to spielberger.susan@epa.gov. For comments submitted at Regulations.gov, follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from Regulations.gov. For either manner of submission, EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be confidential business information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). For additional submission methods, please contact the person identified in the **For Further Information Contact** section. For the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit https://www.epa.gov/dockets/commenting-epa-dockets.

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SUPPLEMENTARY INFORMATION: Throughout this document, "we," "us," and "our" refer to EPA.

Table of Contents

I. Background

Under section 109 of the CAA, EPA has established NAAQS for certain pervasive air pollutants (referred to as "criteria pollutants") and conducts periodic reviews of the NAAQS to determine whether they should be revised or whether new NAAQS should be established. EPA sets the NAAQS for criteria pollutants at levels required to protect public health and welfare. "Primary" NAAQS are those determined by EPA as requisite to protect human health, while "secondary" NAAQS are those determined by EPA as requisite to protect the public welfare from any known or anticipated adverse effects of the NAAQS pollutant.[1] Particulate matter is one of the criteria pollutants for which EPA has established health-based standards. The CAA requires states to submit regulations that control particulate matter emissions.

Particulate matter includes particles with diameters that are generally 2.5 microns or smaller (referred to as $PM_{2.5}$) and particles with diameters that are generally 10 microns or smaller (or PM_{10}). Particulate matter has deleterious effects on the environment, both to human health and to plants and wildlife. The effects on human health include premature mortality, aggravation of respiratory and cardiovascular disease, and decreased lung function. Some individuals, such as

[1] *See* CAA section 109(b).

older adults and people with lung or heart disease, are particularly sensitive to $PM_{2.5}$ exposure. Impacts on the environment include impairment of visibility, as well as damage to vegetation and ecosystems.[2] Sources can directly emit $PM_{2.5}$ into the atmosphere, in the form of a solid or a liquid particle (i.e., "direct $PM_{2.5}$" or "primary $PM_{2.5}$"). $PM_{2.5}$ can also form as a result of chemical reactions in the atmosphere of precursor pollutants emitted from sources (i.e. "secondary $PM_{2.5}$"). Such secondary $PM_{2.5}$ precursor pollutants include nitrogen oxides (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOC), and ammonia.[3]

On July 18, 1997, EPA revised the particulate matter NAAQS to establish new primary and secondary annual and 24-hour standards for $PM_{2.5}$.[4] The annual standard was set at 15.0 micrograms per cubic meter ($\mu g/m^3$), based on a 3-year average of annual mean $PM_{2.5}$ concentrations. The 24-hour (daily) standard was set at 65 $\mu g/m^3$ based on the 3-year average of the annual 98th percentile values of 24-hour $PM_{2.5}$ concentrations at each population-oriented monitor within an area.[5]

On October 17, 2006,[6] EPA revisited the particulate matter NAAQS, retaining the annual average $PM_{2.5}$ NAAQS at 15 $\mu g/m^3$, but revising the 24-hour $PM_{2.5}$ NAAQS to 35 $\mu g/m^3$ (based on a 3-year average of the annual 98th percentile values of 24-hour concentrations).[7] On January 15, 2013, EPA finalized the 2012 $PM_{2.5}$ NAAQS, which revised the annual standard to 12.0 $\mu g/m^3$ based on a 3-year average of annual mean $PM_{2.5}$ concentrations, but retained the current 24-hour standard of 35 $\mu g/m^3$ based on a 3-year average of the 98th percentile of 24-hour

[2] *See* 78 FR 3086, 3088 (January 15, 2013).
[3] *See* EPA, Air Quality Criteria for Particulate Matter, No. EPA/600/P-99/002aF and EPA/600/P-99/002bF, October 2004.
[4] 62 FR 38652 (July 18, 1997).
[5] In this action, EPA set primary and secondary standards at the same level for both the 24-hour and the annual $PM_{2.5}$ standards.
[6] *See* 71 FR 61144.
[7] Under 40 CFR part 50, the primary and secondary 2006 24-hour $PM_{2.5}$ NAAQS are attained when the annual arithmetic mean concentration (as determined in accordance with 40 CFR part 50, appendix N) is less than or equal to 35 $\mu g/m^3$ at all relevant monitoring sites in the subject area, averaged over a 3-year period.

concentrations.[8]

Following promulgation of a new or revised NAAQS, EPA is required by CAA section 107(d) to designate areas throughout the nation as attaining or not attaining the NAAQS. EPA designated and classified the Allegheny County area as "Moderate" nonattainment for the 2012 annual $PM_{2.5}$ standards based on ambient monitoring data that showed the area was above 12.0 $\mu g/m^3$ for the 2011-2013 monitoring period.[9] Based on monitoring data for the 2011-2013 period, the $PM_{2.5}$ annual design values for the Liberty monitor [AIRS ID 42-00300064] were 13.4 $\mu g/m^3$.

The Allegheny County 2012 $PM_{2.5}$ nonattainment area lies in southwestern Pennsylvania and in 2018 had a population of 1,218,452 persons. Pittsburgh is the largest city in Allegheny County, which also contains the Cities of Clairton, Duquesne, and McKeesport. In total, the County has 130 self-governing municipalities. Allegheny County has complex, mountainous terrain cut by numerous river valleys, which can work to trap locally generated air pollutants. Within the County, some river valleys lie at less than 720 feet in elevation above mean sea level (MSL), while adjacent hilltops can be greater than 1250 feet – with frequently large temperature differences between the hilltop and valley floor (e.g. 2 to 7 °F) during clear, light-wind, nighttime conditions. The combination of higher elevation mountainous terrain and river valleys, in conjunction with cool weather, traps locally generated pollution and makes the area prone to atmospheric inversions that impair $PM_{2.5}$ dispersion, sometimes for multiple days, particularly during winter. The Liberty monitor sits above the east bank of the Monongahela River at an elevation of 1,100 feet, immediately downwind of the highest emitting $PM_{2.5}$ stationary source in the area, the U.S. Steel Clairton Coke Works, which lies in the river valley at an elevation 300 feet below the monitor. As a result, the monitored $PM_{2.5}$ values at the Liberty monitor are

[8] *See* 78 FR 3086.
[9] *See* 80 FR 2206 (January 15, 2015).

sometimes far higher than those of other monitors in the surrounding region.

ACHD has the primary responsibility for developing a plan to attain the 2012 annual $PM_{2.5}$ NAAQS in this area, working in conjunction with the PADEP in preparing the Allegheny County $PM_{2.5}$ Plan. Under Pennsylvania law, authority for regulating sources in the area is split between the County and Pennsylvania, with ACHD having primary responsibility for regulating stationary sources in the area.

II. Clean Air Act Plan Requirements for Areas Designated Moderate Nonattainment for the $PM_{2.5}$ NAAQS

A January 4, 2013, U.S. Court of Appeals for the District of Columbia Circuit decision[10] stated that EPA must implement $PM_{2.5}$ NAAQS pursuant to title I, part D, subpart 4 of the CAA, which contains provisions specifically concerning PM_{10} nonattainment areas. With respect to the statutory requirements for attainment plans for the 2012 annual $PM_{2.5}$ NAAQS, general CAA nonattainment area planning requirements are found in part D, subpart 1, and planning requirements specific to areas designated Moderate for particulate matter are found in subpart 4 of part D.

EPA has a longstanding general guidance document interpreting the 1990 amendments to the CAA, referred to as the General Preamble for the Implementation of title I of the Clean Air Act of 1990 (or the "General Preamble").[11] The General Preamble addresses the relationship between the requirements of CAA part D, subpart 1 and subpart 4, and provides recommendations to states for meeting certain statutory requirements for particulate matter attainment plans. As explained in the General Preamble, requirements specific to Moderate area attainment plan SIP submissions for particulate matter NAAQS are set forth in subpart 4 of part D, title I of the CAA. However, such SIP submissions must also meet the general attainment planning provisions in subpart 1 of part D, title I of

[10] *Natural Resources Defense Council v. EPA*, 706 F. 3d 428 (D.C. Cir. 2013).
[11] *See* General Preamble, 57 FR 13498 (April 16, 1992).

the CAA, to the extent these provisions "are not otherwise subsumed by, or integrally related to," the more specific subpart 4 requirements.[12]

To implement the $PM_{2.5}$ NAAQS, EPA also promulgated the "Fine Particulate Matter National Ambient Air Quality Standard: State Implementation Plan Requirements; Final Rule" (or the "$PM_{2.5}$ SIP Requirements Rule").[13] The $PM_{2.5}$ SIP Requirements Rule provides additional regulatory requirements and guidance applicable to attainment plan submissions for the $PM_{2.5}$ NAAQS, including the 2012 annual $PM_{2.5}$ NAAQS that is the subject of this action. The $PM_{2.5}$ SIP Requirements Rule also clarifies how states should meet the statutory SIP requirements that apply to areas designated nonattainment for any $PM_{2.5}$ NAAQS under both subparts 1 and 4.

The CAA subpart 1 statutory requirements for attainment plans include: i) the section 172(c)(1) requirements for RACM/RACT and attainment demonstrations; ii) the section 172(c)(2) requirement to demonstrate RFP; iii) the section 172(c)(3) requirement for preparation of emissions inventories; iv) the section 172(c)(5) requirements for adoption of a nonattainment new source review (NNSR) permitting program; and v) the section 172(c)(9) requirement to adopt contingency measures.

Requirements specific to Moderate $PM_{2.5}$ nonattainment areas under CAA subpart 4 include: i) the section 189(a)(1)(A) and 189(e) NNSR permit program requirements; ii) the section 189(a)(1)(B) requirements for attainment demonstrations; iii) the section 189(a)(1)(C) requirements for RACM; and iv) the section 189(c) requirements for RFP and QMs. Under CAA subpart 4, states with Moderate $PM_{2.5}$ nonattainment areas must provide for attainment in the area as expeditiously as practicable (but no later than December 31, 2021) for the 2012 $PM_{2.5}$ annual NAAQS. In addition, under CAA subpart 4, direct $PM_{2.5}$ (and all precursors to the formation of $PM_{2.5}$) are subject to

[12] *See* 57 FR 13538, April 16, 1992.
[13] *See* 81 FR 58010, August 24, 2016.

control unless EPA approves a demonstration from the state establishing that a given precursor does not contribute significantly to $PM_{2.5}$ levels that exceed the $PM_{2.5}$ NAAQS in the area.[14]

III. Review of the Allegheny County $PM_{2.5}$ Plan

A. Emissions Inventories for the Base Year and Attainment Year

1. Requirements for Emissions Inventories

CAA section 172(c)(3) requires that each SIP include a "comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in [the] area ..." By requiring an accounting of actual emissions from all sources of the relevant pollutants in the area, this section provides for the base year inventory to include all emissions that contribute to the formation of a particular NAAQS pollutant. For the 2012 $PM_{2.5}$ NAAQS, this includes emissions of direct $PM_{2.5}$ as well as the main chemical precursors to the formation of secondary $PM_{2.5,}$ including NO_x, SO_2, VOCs, and ammonia (NH_3). Primary $PM_{2.5}$ is comprised of both condensable and filterable particulate matter components.

EPA $PM_{2.5}$ requirements rule establishes that "the base year inventory for the nonattainment area: a) be required to represent one of the 3 years used for designations or another technically appropriate year; b) include actual emissions of all sources within the nonattainment area; c) be annual total or average-season-day emissions in accordance with the NAAQS violation; d) include direct $PM_{2.5}$ (filterable and condensable) as well as all scientific $PM_{2.5}$ precursors…"[15]

A state must include in its SIP submission documentation explaining how the emissions data were calculated. In estimating mobile source emissions, a state should use the latest emissions models and planning assumptions available at the time it develops the SIP

[14] *See* 40 CFR 51.1006 and 51.1009.
[15] 81 FR 58027-58033, August 24, 2016.

submission.[16] States are also required to use EPA's "Compilation of Air Pollutant Emission Factors" (AP-42)[17] road dust method for calculating re-entrained road dust emissions from paved roads.[18] MOVES is EPA's state-of-the-art tool for estimating emissions from on-road mobile sources. At the time ACHD prepared the SIP, MOVES2014a was the latest available version of the MOVES model, which included new data, emission standards, and functional improvements and features over prior versions of the model.[19] EPA subsequently released an updated MOVES model (MOVES2014b) in August 2018, which better estimates non-road mobile emissions compared to MOVES2014a. However, MOVES2014b was not available at the time ACHD began working on emission inventories in support of this plan, and EPA does not consider MOVES2014b a new model for SIP and transportation conformity purposes.[20]

In addition to the base year inventory submitted to meet the requirements of CAA section 172(c)(3), the State must also submit future "baseline inventories" for the projected attainment year and each RFP milestone year, and any other year of significance for meeting applicable CAA requirements.[21] By "baseline inventories" (also referred to as "projected baseline inventories"), we mean projected emissions inventories for future years that account for, among other things, the ongoing effects of economic growth and adopted emissions control requirements. The SIP submission should include documentation to explain how the state calculated the emissions

[16] *See* EPA's "Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes," (EPA-420-B-14-008; July 2014), p. 6.
[17] EPA released an update to AP-42 in January 2011 that revised the equation for estimating paved road dust emissions based on an updated data regression that included new emission tests results.
[18] *See* 76 FR 6328 (February 4, 2011).
[19] *See* EPA guidance document "Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes" (EPA-420-B-14-008; July 2014).
[20] *See* EPA guidance document "EPA Releases MOVES2014b Mobile Source Emissions Model: Questions and Answers," (EPA-420-F-18-014; August 2018), available at: *https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100V7H1.pdf*.
[21] *See* 40 CFR 51.1007(a), 51.1008(b), and 51.1009(f). *See also* U.S. EPA, "Emissions Inventory Guidance for Implementation of Ozone [and Particulate Matter] National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," available at: *https://www.epa.gov/sites/production/files/2017-07/documents/ei_guidance_may_2017_final_rev.pdf*.

projections.

2. Emissions Inventories in the Allegheny County $PM_{2.5}$ Plan

The Allegheny County $PM_{2.5}$ nonattainment area emissions inventory has both small and medium city typical emission sources and is home to several large industrial sources of $PM_{2.5}$ pollution. The Monongahela River Valley contains the U.S. Steel Corporation's Mon Valley Works, which includes the largest coke manufacturing plant in the United States (the U.S. Steel Clairton Coke Works) as well as the Irvin and Edgar Thomson steel works. The area is also home (or nearby to) to several steel manufacturing facilities, coal fired electric generating facilities, and other manufacturing and industrial facilities.

As specified by EPA's $PM_{2.5}$ Implementation Rule, pollutants inventoried for the Allegheny County $PM_{2.5}$ area include primary (direct) $PM_{2.5}$ along with precursors SO_2, NO_x, VOC, and NH_3. Particulate emissions are also transported into the Allegheny County area from surrounding counties in southwestern Pennsylvania, as well as surrounding, upwind states. EPA's Emissions Inventory Guidance for $PM_{2.5}$ specifies that PM_{10} should also be included because PM_{10} emissions are often used as the basis for calculating $PM_{2.5}$.[22]

The 2021 inventory is a projection of the 2011 base year inventory, which accounts for expected growth trends for each source category, as well as emission reductions from adopted and implemented control measures. This projection inventory also factors in stationary source shutdowns occurring since the base year. Local projections were focused on $PM_{2.5}$ and precursor reductions from stationary point source emissions, while regional projections were based on reductions from all sectors as incorporated into the Mid-Atlantic Regional Air Management

[22] *See* U.S. EPA, "Emissions Inventory Guidance for Implementation of Ozone [and Particulate Matter] National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," available at: *https://www.epa.gov/sites/production/files/2017-07/documents/ei_guidance_may_2017_final_rev.pdf*

Association (MARAMA) inventories. ACHD staff worked with PADEP to develop the base year and projection emissions inventories for the Allegheny County $PM_{2.5}$ nonattainment area.

The base 2011 and future projection 2021 emissions inventories for the Allegheny County $PM_{2.5}$ area used in this demonstration are found in Section 4 (Emissions Inventories) of the Commonwealth's September 30, 2019 SIP revision, with detailed emissions inventories found in Appendix D (Emissions Inventories) of the SIP revision. Documentation of the regional inventory development is included in Appendix E (Emissions Inventory Documentation) of the SIP revision, and emissions inputs used for the modeling are described in Section 5 (Modeling Demonstration) and Appendix F (Modeling Protocols). Table 1 provides a summary of the 2011 base year emission inventory for the Allegheny County area in tons per year (tpy) of direct $PM_{2.5}$ and $PM_{2.5}$ precursors and also a summary of the 2021 projected emissions inventory.

Table 1 – Base Year and Projected Attainment Year Emission Inventories for Allegheny County (tons per year)

2011 Base Year Emission Inventory for Allegheny County, by Sector (tons per year)

Allegheny County (2011)	$PM_{2.5}$ (total)	$PM_{2.5}$ (filterable)	$PM_{2.5}$ (condensable)	PM_{10}	SO_2	NO_x	VOC	NH_3
Point Sources	2,503	1,338	1,164	2,987	13,460	11,128	1,169	207
Area Sources	2,491	2,011	480	4,683	1,528	6,979	11,200	621
Non-road Mobile Sources	361	361	0	378	11	3,921	3,780	5
Highway Mobile Sources	450	450	0	984	78	13,259	7,383	304
Fires	24	24	0	29	2	5	64	4
Biogenic Sources	0	0	0	0	0	166	5,876	0
Total	5,829	4,185	1,644	9,061	15,080	35,460	29,972	1,141

2021 Projected Emission Inventory for Allegheny County, by Sector (tons per year)

Allegheny County (2021)	$PM_{2.5}$ (total)	$PM_{2.5}$ (filter)	$PM_{2.5}$ (condensable)	PM_{10}	SO_2	NO_x	VOC	NH_3
Point Sources	2,256	1,256	999	2,722	5,921	7,928	1,534	202
Area Sources	2,708	2,226	472	5,486	1,079	6,664	10,221	615
Non-road Mobile Sources	234	234	0	248	5	2,212	2,752	6
Highway Mobile Sources	266	266	0	722	31	5,708	3,479	209
Fires	24	24	0	29	2	5	64	4
Biogenic Sources	0	0	0	0	0	168	5,876	0
Total	5,488	4,007	1,471	9,207	7,039	22,684	23,926	1,037

3. EPA's Evaluation and Proposed Action on the Emission Inventories

The emission inventories in the Allegheny County area $PM_{2.5}$ plan are based on the most current and accurate information available to PADEP and ACHD at the time the attainment plan was developed and used the most recently available tools and planning assumptions. The emission inventories in the attainment plan comprehensively address all source categories in the Allegheny County $PM_{2.5}$ nonattainment area and were developed consistent with EPA's emission inventory preparation guidance. The selection of 2011 for use as a base year emissions inventory is one of the three years (2011-2013) used for purposes of designation of the area and the 2021 projection emissions inventory corresponds to the moderate area attainment deadline, in accordance with EPA's SIP requirements rule. The inventories model direct $PM_{2.5}$ (including the filterable and condensable components), as well as $PM_{2.5}$ precursor emissions. For these reasons, we are proposing to approve the 2011 base year emissions inventory in the Allegheny County $PM_{2.5}$ Plan as meeting the requirements of CAA section 172(c)(3). We are also proposing to find that the 2021 projected inventory in the plan is an adequate basis for the determination of RACM, RFP, and for demonstrating attainment in the Allegheny County $PM_{2.5}$ Plan. For further

information on our review of the emission inventories supporting this plan, refer to EPA's Technical Support Document (TSD) for Emission Inventories prepared in support of this action, which is available in the docket.

B. Particulate Matter Precursor Demonstration

1. $PM_{2.5}$ Precursor Requirements

The provisions of subpart 4 of part D, title I of the CAA do not define the term "precursor" for purposes of $PM_{2.5}$, nor does subpart 4 explicitly require the control of any specifically identified PM precursor. However, the definition of "air pollutant" in CAA section 302(g) "includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used."

In the $PM_{2.5}$ SIP Requirements Rule, EPA recognized that treatment of $PM_{2.5}$ precursors is an important issue in developing a $PM_{2.5}$ attainment plan.[23] Therein, EPA identified SO_2, NO_x, VOC, and NH_3 as precursors to formation of $PM_{2.5}$. Accordingly, the attainment plan requirements of subpart 4 apply to emissions of all four precursor pollutants and direct $PM_{2.5}$ from all types of stationary, area, and mobile sources, except as otherwise provided in the Act (*e.g.*, in CAA section 189(e)).

Section 189(e) of the CAA requires that the control requirements for major stationary sources of direct PM_{10} (which includes $PM_{2.5}$) also apply to major stationary sources of PM_{10} precursors, except where the Administrator determines that such sources do not contribute significantly to PM_{10} levels that exceed the standard in the area. Section 189(e) contains the only expressed exception to the control requirements under subpart 4 for sources of $PM_{2.5}$ precursor

[23] *See* section III of EPA's $PM_{2.5}$ SIP Requirements Rule (81 FR 58017, August 24, 2016).

emissions. Although section 189(e) explicitly addresses only major stationary sources, EPA interprets the Act as authorizing it to also determine, under appropriate circumstances, that regulation of specific $PM_{2.5}$ precursors from other sources in a given nonattainment area is not necessary.

Under the $PM_{2.5}$ SIP Requirements Rule, a state may elect to submit to EPA a "comprehensive precursor demonstration" for a specific nonattainment area to show that emissions of a particular precursor from all existing sources located in the nonattainment area do not contribute significantly to $PM_{2.5}$ levels that exceed the standard in the area.[24] Such a comprehensive precursor demonstration must include a concentration-based contribution analysis (*i.e.,* evaluation of the contribution of a particular precursor to $PM_{2.5}$ levels in the area) and may also include a sensitivity-based contribution analysis (*i.e.,* evaluation of the sensitivity of $PM_{2.5}$ levels in the area to a decrease in emissions of the precursor). If EPA determines that the contribution of the precursor to $PM_{2.5}$ levels in the area is not significant and approves the demonstration, the state is not required to control emissions of the relevant precursor from existing sources in the current attainment plan.[25]

EPA issued $PM_{2.5}$ Precursor Demonstration Guidance ("Precursor Guidance") to provide recommendations to states for conducting an optional, comprehensive precursor demonstration as part of an attainment plan SIP submission.[26] Section 1.1.1 of the Precursor Guidance describes the steps for performing a precursor demonstration. First, a concentration-based analysis should be performed to determine whether all emissions of the relevant precursor contribute significantly

[24] *See* 40 CFR 51.1006(a)(1).
[25] Id.
[26] *See* EPA Office of Air Quality Planning and Standards, "Fine Particulate Matter ($PM_{2.5}$) Precursor Demonstration Guidance," [EPA-454/R-19-004, May 30, 2019] https://www.epa.gov/pm-pollution/pm25-precursor-demonstration-guidance.

to total $PM_{2.5}$ concentrations. If the concentration-based analysis does not support a finding of insignificant contribution, then a sensitivity analysis may be conducted to evaluate, through air quality modeling, the effect of reducing emissions of the precursor (by a certain percentage) from either all existing emission sources of the precursor or only existing major stationary sources of the precursor, on $PM_{2.5}$ levels in the area.

Section 2.2 of the Precursor Guidance recommends the use of 0.2 $\mu g/m^3$ for the annual $PM_{2.5}$ NAAQS and 1.5 $\mu g/m^3$ for the 24-hour $PM_{2.5}$ NAAQS as thresholds below which ambient air quality impacts could be considered "insignificant" (*i.e.*, impacts that do not "contribute" to $PM_{2.5}$ concentrations that exceed the NAAQS). When considering whether a precursor contributes significantly to $PM_{2.5}$ levels which exceed the NAAQS in the area, a state may also consider additional factors based on the specific circumstances of the area. As to air quality impacts that exceed the 0.2 $\mu g/m^3$ annual or 1.5 $\mu g/m^3$ 24-hour contribution thresholds, states may provide additional support for a conclusion that a particular precursor does not contribute significantly to ambient $PM_{2.5}$ levels that exceed the NAAQS. States may consider other information, such as the amount by which the impacts exceed the recommended contribution threshold; the severity of nonattainment at relevant monitors and/or grid cell locations in the area; anticipated growth or loss of sources; analyses of speciation data and precursor emission inventories; and air quality trends.[27]

2. Precursor Demonstration in the Allegheny County $PM_{2.5}$ Plan

The Allegheny County $PM_{2.5}$ Plan includes a comprehensive precursor demonstration, which evaluates the impact of the precursors VOC and NH_3 to nonattainment of the $PM_{2.5}$ NAAQS in Allegheny County. The concentration-based analysis indicates that all precursors

[27] Id. at p. 17.

show ambient monitored levels above the thresholds for significant contribution.[28] Therefore, a sensitivity analysis was performed using Comprehensive Air Quality Model with extensions (CAMx).[29] CAMx is a Eulerian photochemical grid model that simulates a wide variety of inert and chemically active pollutants, including ozone, particulate matter, inorganic and organic $PM_{2.5}/PM_{10}$, and mercury and other toxics. For the sensitivity analysis, a total of three CAMx runs were used to evaluate $PM_{2.5}$ sensitivity to reductions of NH_3 and VOC emissions in Allegheny County: A base case and two sensitivity-case runs. For one sensitivity-case run, anthropogenic emissions of VOC in Allegheny County were reduced by 50%. For the other sensitivity-case run, anthropogenic emissions of NH_3 were reduced by 50%. For both runs, the 50% reductions were applied to both point and area source anthropogenic emissions with all other emissions held constant. EPA's Modeled Attainment Test Software (MATS) was then used to model design values at monitoring sites in Allegheny County with and without the 50% reduction in VOC and NH_3. Table 2 shows the projected annual and 24-hour reductions in $PM_{2.5}$ design values (DVs) at the monitoring sites in the nonattainment area based on the reductions for VOC and NH_3. Additional information regarding the sensitivity analysis can be found in Appendix I.4 (Precursor Insignificance Demonstration) of the Allegheny County $PM_{2.5}$ Plan.

Table 2 – Sensitivity Test Reductions in Design Values (DVs) at Allegheny County Area Monitors

Monitoring Site	AQS ID	Annual Basis		24-Hour Basis	
		Reduction in DV with 50% less VOC ($\mu g/m^3$)	Reduction in DV with 50% less NH_3 ($\mu g/m^3$)	Reduction in DV with 50% less VOC ($\mu g/m^3$)	Reduction in DV with 50% less NH_3 ($\mu g/m^3$)
Avalon	42-003-0002	0.01	0.20	0.0	0.1

[28] For additional information on the concentration-based analysis, see Appendix C of the Allegheny County $PM_{2.5}$ Plan.

[29] CAMx is a photochemical grid model that simulates a wide variety of inert and chemically active pollutants, including ozone, particulate matter, inorganic and organic $PM_{2.5}/PM_{10}$, and mercury and other toxics.

Monitoring Site	AQS ID	Annual Basis		24-Hour Basis	
Lawrenceville	42-003-0008	0.00	0.23	0.0	0.0
Liberty	42-003-0064	0.00	0.15	0.0	0.8
South Fayette	42-003-0067	0.00	0.10	0.0	0.1
North Park	42-003-0093	0.00	0.17	0.1	0.9
Harrison	42-003-1008	0.00	0.13	0.0	0.0
North Braddock	42-003-1301	0.00	0.21	0.0	0.4
Clairton	42-003-3007	0.00	0.13	0.0	0.0

As can be seen in Table 2, the modeled decreases in design values due to a 50% reduction in VOC and NH_3 at the Liberty monitor are both below the significance thresholds of 0.2 µg/m^3 for the annual $PM_{2.5}$ NAAQS and 1.5 µg/m^3 for the 24-hour $PM_{2.5}$ NAAQS. Therefore, ACHD determined that VOC and NH_3 are both insignificant contributors to nonattainment in Allegheny County and excluded both precursors from additional analysis in the Allegheny County $PM_{2.5}$ Plan.

3. EPA's Evaluation and Proposed Action on the Precursor Demonstration

EPA has reviewed the comprehensive precursor demonstration included in the Allegheny County $PM_{2.5}$ Plan and is proposing to find that it meets the requirements of the $PM_{2.5}$ SIP Requirements Rule and EPA's Precursor Guidance. The comprehensive precursor demonstration includes a sensitivity analysis that indicates that the estimated impacts of a 50% reduction in point and area source anthropogenic emissions of VOC and NH_3 are below the significance thresholds of 0.2 µg/m^3 for the annual $PM_{2.5}$ NAAQS and 1.5 µg/m^3 for the 24-hour $PM_{2.5}$ NAAQS at the Liberty monitor, which has consistently been the highest reading $PM_{2.5}$ monitor in Allegheny County and the only monitor in the County not meeting the 2012 annual $PM_{2.5}$ NAAQS. Since the estimated impacts at the Liberty monitor are below the significance threshold, it can be concluded, for purposes of the precursor demonstration, that the precursors VOC and NH_3 do not significantly contribute to nonattainment of the $PM_{2.5}$ NAAQS in Allegheny County. Therefore,

pursuant to 40 CFR 51.1006, EPA is proposing to find that Allegheny County is not required to control emissions of VOC or NH_3 from existing sources in the Allegheny County $PM_{2.5}$ Plan.

C. Reasonably Available Control Measures (RACM)/Reasonably Available Control Technology (RACT)

1. Requirements for RACM/RACT

CAA section 172(c)(1) requires that each attainment plan "provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national ambient air quality standards." Section 189(a)(1)(C) of the CAA requires that states with areas classified as moderate nonattainment for $PM_{2.5}$ have attainment plan provisions to assure that RACM and RACT are implemented no later than four years after designation of the area. EPA reads CAA sections 172(c)(1) and 189(a)(1)(C) together to require that attainment plans for moderate nonattainment areas must provide for the implementation of RACM and RACT for existing sources of $PM_{2.5}$ and $PM_{2.5}$ precursors in the nonattainment area as expeditiously as practicable but no later than four years after designation.[30]

The preamble to the $PM_{2.5}$ SIP Requirements Rule defines RACM as "any technologically and economically feasible measure that can be implemented in whole or in part within four years after the effective date of designation of a $PM_{2.5}$ nonattainment area," including RACT.[31] The preamble also recommends steps for evaluating control measures as part of a RACM/RACT analysis.[32] In short, a RACM/RACT analysis is a process for states to identify emission sources, evaluate potential emission controls, and impose those control measures and technologies that are

[30] *See* 81 FR 58010 and 58034, August 24, 2016.
[31] See 81 FR 58010-58035 and 58043, August 24, 2016, as well as 40 CFR 51.1009(a)(4)(i)(A).
[32] *See* 81 FR 58010-58035 and 58046, August 24, 2016.

reasonable and necessary to bring the area into attainment as expeditiously as practicable, but no later than the statutory attainment date for the area.

Pursuant to the preamble of the $PM_{2.5}$ SIP Requirements Rule, in the case of a moderate area that can demonstrate it can attain by the statutory attainment date without implementing all reasonably available control measures (i.e. RACM/RACT and additional reasonable measures), the state would not be required to adopt certain otherwise reasonable measures if the state demonstrates that collectively such measures would not enable the area to attain the standard at least one year earlier (i.e. "advance the attainment date" by one year).[33] The attainment date for the Allegheny County nonattainment area is December 31, 2021.

2. RACM Analysis in the Allegheny County $PM_{2.5}$ Plan

A summary of ACHD's RACM analysis is provided in Section 6 of the Allegheny County $PM_{2.5}$ Plan and a detailed analysis is provided in Appendix J. Based on the insignificance findings for VOC and NH_3, ACHD did not evaluate options for the control of VOC and NH_3 in their RACM analysis. ACHD's RACM analysis examines options for the control of primary $PM_{2.5}$ and precursors SO_2 and NO_x in the Allegheny County nonattainment area for the following source categories: Area sources, non-road mobile sources, on-road mobile sources, and some small point sources.

For each source category, ACHD evaluated RACM alternatives through the following process: 1) examine source category emissions in the nonattainment area; 2) determine technologically feasible control technologies or measures for each source category; and, 3) for each technologically feasible control technology or measure, examine the control efficiency by pollutant, the estimated emission reductions by pollutant, the estimated cost per ton of pollutant

[33] *See* 81 FR 58018, August 24, 2016.

reduced, and the date by which the technology or measure could be reasonably implemented.

a. RACM Measures Evaluation

Table 3 lists the RACM measures in the Allegheny County $PM_{2.5}$ Plan. These measures are discussed in more detail in Appendix J of the Allegheny County $PM_{2.5}$ Plan, which is located in the docket for this rulemaking.

Table 3 – Summary of RACM Alternatives Evaluated for Allegheny County

Source Category Group	Existing Controls/Programs	RACM Alternative(s)	Notes
Agriculture	None	None identified	Small source of emissions; mostly NH_3 emissions, NH_3 is an insignificant precursor in the nonattainment area
Commercial Cooking	None	1. Charbroiler catalytic oxidizers for chain-driven broilers 2. HEPA filters for under-fired boilers	1. Small emission reductions county-wide 2. Full implementation could take five years from promulgation
Cremation	None	None identified	Small source of emissions county-wide; permit restrictions are BACT
Fuel Combustion (Industrial and Commercial)	Federal standards for boilers and engines	Low-NO_x burners	Full implementation could take five years from promulgation
Fuel Combustion (Residential)	Sulfur limit for home heating oil	None identified	Small source of emissions compared to commercial and industrial fuel combustion
Fuel Combustion (Residential Wood)	1. Fireplace insert program 2. Prohibition of non-phase 2 outdoor wood-fired boilers (OWBs) 3. No outdoor burning when Air Quality Action Days are predicted 4. Wood stove change-out program	1. Additional wood stove change-out program 2. Education and outreach on clean burning 3. Replacement of old stoves when homes are sold 4. OWB compliance for pre-2011 units	1. Insignificant emission reductions 2. Reductions difficult to quantify 3. Reductions and costs difficult to quantify; Significant $PM_{2.5}$ emission reductions unlikely within short to medium timeframe

Source Category Group	Existing Controls/Programs	RACM Alternative(s)	Notes
			4. Insignificant emission reductions
Fugitive Dust	Use of dust suppressants	Paving of all unpaved roads countywide	Small emission reductions county-wide
Oil and Gas Exploration and Production	None	No feasible, cost effective options were identified	None
Petroleum Storage	None	None identified	VOC emissions only, VOC is an insignificant precursor in the nonattainment area
Solvent Utilization	ACHD regulations	None identified	VOC emissions only, VOC is an insignificant precursor in the nonattainment area
Surface Coatings	ACHD regulations	None identified	VOC emissions only, VOC is an insignificant precursor in the nonattainment area
Marine	Federal standards; towboat repowering project	1. Vessel repowering from Tier 0 to newer engines 2. Retrofit tugboats with diesel particulate filters 3. Control idling 4. Pleasure craft controls	1. High costs 2. Small emission reductions 3. Emission reductions not quantified, potential insignificant emission reductions 4. Emission reductions not quantified, potential insignificant emission reductions that are not cost effective
Railroad	Federal standards	Replacement of older engines to newer engines	High costs relative to emission reductions
Off-Highway Equipment (Gasoline)	Rebate program for gasoline-fueled equipment exchange	Additional gas-for electric exchange programs	Emission reductions not quantified, potential insignificant emission reductions
Off-Highway Equipment (Diesel)	Federal Standards; idling restrictions	Retrofit construction equipment with a	Small emission reductions county-

Source Category Group	Existing Controls/Programs	RACM Alternative(s)	Notes
		diesel particulate filter (DPF)	wide
Off-Highway Equipment (Other)	None	None identified	None
Gasoline Refueling	Stage II vapor recovery systems	None identified	VOC emissions only, VOC is an insignificant precursor in the nonattainment area
Gasoline Vehicles (Light-Duty) _	Federal emission standards; Inspection/Maintenance (I/M) program	Ridesharing program	Reductions not quantified; light duty gasoline vehicles show large reductions through 2021 with current controls
Gasoline Vehicles (Heavy-Duty)	Federal emission standards; idling restrictions	None	Small portion of the on-road mobile source inventory
Diesel Refueling	None	None identified	VOC emissions only, VOC is an insignificant precursor in the nonattainment area
Diesel Vehicles (Light-Duty)	Federal emission standards; idling restrictions	None identified	Small portion of the on-road mobile source inventory
Diesel Vehicles (Heavy Duty)	Federal emission standards; idling restrictions	1) Additional diesel engine retrofits 2) Replacement of public or private fleets ahead of normal schedule 3) Additional diesel idling requirements	1) Small emission reductions county-wide 2) Small emission reductions county-wide 3) Reductions not quantified
Compressed Natural Gas (CNG) Vehicles (Heavy Duty)	None	None identified	Small portion of the on-road mobile source inventory
Ethanol E-85 Vehicles (Light-duty gasoline, capable of burning 85% ethanol 15% gasoline blend)	None	None identified	Small portion of the on-road mobile source inventory
Aggregate	Rules in effect for stone,	Require water sprays,	None

Source Category Group	Existing Controls/Programs	RACM Alternative(s)	Notes
Processing	sand, and gravel operations	dust suppressants, telescopic chutes, and baghouse/cyclone dust collectors	

3. RACT Analysis in the Allegheny County $PM_{2.5}$ Plan

Section 6 of the Allegheny County $PM_{2.5}$ Plan also includes a summary of ACHD's RACT analysis. ACHD's detailed analysis is provided in Appendix J of the Allegheny County $PM_{2.5}$ Plan.

ACHD used the following methodology for their RACT analysis: 1) identify all current major stationary point sources of $PM_{2.5}$, SO_2, or NO_x in the Allegheny County nonattainment area; 2) identify the different processes, or process groups, for the applicable major source facilities and the current controls for the processes; 3) identify potential RACT alternatives for the process groups; and 4) evaluate the technological and economic feasibility of any potential RACT alternatives.[34]

a. RACT Measures Evaluation

Table 4 summarizes the identified facilities and corresponding findings from ACHD's RACT analysis for the Allegheny County $PM_{2.5}$ Plan. ACHD's complete RACT analysis is provided in Appendix J of the Allegheny County $PM_{2.5}$ Plan.

Table 4 – Summary of RACT Analysis in Allegheny County $PM_{2.5}$ Plan

Facility	Major Pollutants	Summary of Facility	Controls	RACT Findings
Allegheny Energy Springdale	PM, NO_x	Combined-cycle turbine EGU, natural gas (NG) or	Low NO_x burners (LNB), selective catalytic	Meets RACT requirements

[34] An explanation of sources that were excluded from ACHD's RACT analysis as well as the control technologies that were analyzed are provided in Appendix J of the Allegheny County $PM_{2.5}$ Plan.

Facility	Major Pollutants	Summary of Facility	Controls	RACT Findings
(now Springdale Energy)		fuel oil	reduction (SCR)	
ATI Allegheny Ludlum	PM, SO_2, NO_x	Specialty steel facility	Baghouses, ultra-low NO_x burners (ULNB), mist eliminators	Meets RACT requirements
Bay Valley (now Riverbend)	NO_x	Food manufacturing facility	LNB, flue gas recirculation (FGR); switched from coal to natural gas as fuel for all units	Meets RACT requirements
Bellefield Boiler	NO_x	Steam generation facility	LNB, FGR	Meets RACT requirements
Energy Center Pittsburgh (North Shore)	NO_x	District heating and cooling plant	LNB, drift eliminators	Meets RACT requirements
GenOn Brunot Island	PM, SO_2, NO_x	Combined-cycle turbine EGU, NG or fuel oil	Water injection with SCR, mist eliminators	Meets RACT requirements
GenOn Cheswick	PM, SO_2, NO_x	Coal-fired EGU	FGD, LNB with overfire air (OFA), SCR, ESP	Meets RACT requirements
Pittsburgh Allegheny County Thermal (PACT)	NO_x	Steam generation facility	NO_x limits	Meets RACT requirements
Universal Stainless	NO_x	Specialty steel facility	LNB, baghouses	Meets RACT requirements
University of Pittsburgh – Main Campus	NO_x	Public university	ULNB, FGR, low sulfur fuel oil	Meets RACT requirements
U.S. Steel Clairton	PM, SO_2, NO_x	Metallurgical coke and by-products facility	Baghouses, baffles (quench towers), coke oven gas (COG) grain limits, afterburners, visible emission (VE) restrictions	Meets RACT requirements
USS Edgar Thomson	PM, SO_2, NO_x	Iron and steel making facility	Baghouses, COG grain limits, scrubbers, drift eliminators	Meets RACT requirements

Facility	Major Pollutants	Summary of Facility	Controls	RACT Findings
USS Irvin	PM, SO_2, NO_x	Secondary steel processing facility	COG grain limits, scrubbers, mist eliminators	Meets RACT requirements

4. EPA's Evaluation and Proposed Action on RACM and RACT

ACHD has found that no economically or technologically feasible controls (or combination thereof) in Allegheny County are needed to show attainment by the attainment date of December 31, 2021 and that no feasible controls (or combination thereof) will advance the attainment date by one year or more (i.e. to December 31, 2020). The Allegheny County $PM_{2.5}$ Plan includes a modeling demonstration showing that Allegheny County can attain the 2012 $PM_{2.5}$ NAAQS by the December 31, 2021 attainment date through the control strategy described in the plan.

EPA is proposing to approve ACHD's evaluation of RACM/RACT control measures in the Allegheny County $PM_{2.5}$ Plan. ACHD has demonstrated in the plan that Allegheny County can attain the $PM_{2.5}$ NAAQS by the attainment date without implementing RACM/RACT. Also, according to the Allegheny County $PM_{2.5}$ Plan, the implementation of additional control measures will not advance the attainment date in Allegheny County by one year or more. Therefore, EPA is proposing to find that the Allegheny County $PM_{2.5}$ Plan satisfies the RACM/RACT requirements of title I, part D, subpart 1 and subpart 4 of the CAA.

D. Air Quality Modeling

1. Requirements for Air Quality Modeling

Section 189(a)(1)(B) of the CAA requires that a plan for a Moderate $PM_{2.5}$ nonattainment area include a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date, or a demonstration that attainment by such date is

impracticable. An attainment demonstration must show that the control measures in the plan are sufficient to attain the NAAQS by the attainment date. The attainment demonstration predicts future ambient concentrations for comparison to the NAAQS, making use of available information on ambient concentrations, meteorology, and current and projected emissions inventories, including the effect of control measures in the plan. This information is typically used in conjunction with a computer model of the atmosphere.

EPA has provided additional modeling requirements and guidance for modeling analyses in the "Guideline on Air Quality Models" ("Guideline").[35] Per the $PM_{2.5}$ SIP Requirements Rule, the attainment demonstration modeling guidance provides recommendations that include: Developing a conceptual description of the problem to be addressed; developing a modeling/analysis protocol; selecting an appropriate model to support the demonstration; selecting appropriate meteorological episodes or time periods to model; choosing an appropriate area to model with appropriate horizontal/vertical resolution; generating meteorological and air quality inputs to the air quality model; generating emissions inputs to the air quality model; and, evaluating performance of the air quality model. After these steps are completed, the state can apply a model to simulate effects of future year emissions and candidate control strategies.

2. Air Quality Modeling in the Allegheny County $PM_{2.5}$ Plan

ACHD's September 30, 2019 $PM_{2.5}$ SIP revision includes a modeling demonstration showing that monitors in Allegheny County will comply with both the 24-hour and the annual 2012 $PM_{2.5}$ standards by December 31, 2021. The demonstration is based, in part, on results from the CAMx analysis. The modeling analysis also includes a local area analysis using the US EPA's AERMOD Gaussian dispersion model to analyze the direct $PM_{2.5}$ component for the

[35] 40 CFR part 51 appendix W, "Guideline on Air Quality Models," 82 FR 5182, January 17, 2017; available at *https://www.epa.gov/scram/clean-air-act-permit-modeling-guidance.*

Liberty monitor, which has consistently been the highest reading $PM_{2.5}$ monitor in Allegheny County.

The highest PM monitor readings in Allegheny County are generally attributed to a combination of high localized industrial source emissions with strong temperature inversions, which trap those locally generated emissions within the major river valleys. Elevation differences between the valley floors and surrounding terrain can be on the order of 500 feet. Under ideal meteorological conditions (i.e. light winds and clear night-time skies), Allegheny County has observed temperature differences between hilltop and valley floor in the range of 2 to 7 degrees Fahrenheit along with strong channeled flow within the Monongahela River valley ("Mon Valley"). Strong temperature inversions inhibit vertical mixing, trapping emissions emitted at near ground-level within the valleys, contributing to episodes of poor air quality.

Given the topography of the area, which is marked by low mountains and river valleys, and the resulting influence of that topography on localized meteorological conditions and a propensity for atmospheric inversions, ACHD developed their modeling analysis to consider these localized conditions. Further, the modeling analysis needed to properly account for both regional emission sources, and more importantly the specific, localized impacts of several large industrial source emissions that strongly contribute to episodes of poor air quality. Further details related to development of the baseline and projected year inventories can be found in appendices D and E of the Commonwealth's September 30, 2019 SIP revision, which are available in the docket for this rulemaking. The modeling protocols used for the Commonwealth's analysis are found in Appendix F of the September 2019 SIP revision.

Modeling for the Allegheny County area assesses regional impacts from $PM_{2.5}$ precursors and localized impacts from primary $PM_{2.5}$ sources. CAMx was utilized at fine grid resolution to

model both long-range transport and near-field impacts of most sources. EPA's AERMOD Gaussian dispersion model was used for simulating localized primary $PM_{2.5}$ impacts at the Liberty monitor, which has consistently recorded the highest monitor concentrations since $PM_{2.5}$ monitoring began in the area in the late 1990s.

ACHD provided an extensive review of meteorological conditions in Allegheny County over a five-year period from 2009 through 2013.[36] The ACHD analysis involved a general review of inversions, winds, temperature, and precipitation in general and its appropriateness for the modeling demonstration. The modeling demonstration is indicative of these meteorological conditions and the use of 2011 base year emissions data is suitable to represent typical conditions over the five-year (2009-2013) period examined – with the exception of one month (October 2011) that recorded severe inversions.

CAMx-ready emissions were prepared for the 2011 modeling base year and projected 2021 attainment year and pre-processed for input to CAMx using the Sparse Matrix Operator Kernel Emissions (SMOKE) model.[37] CAMx was evaluated using ambient observational data from three monitoring networks: EPA's Air Quality System (AQS) database; Federal Reference Method (FRM) total $PM_{2.5}$ mass; and the Chemical Speciation Network (CSN) speciated $PM_{2.5}$. The Atmospheric Model Evaluation Tool (or AMET) was the primary software tool used to compare observations and modeled values from the 1.333 kilometer (km) domain in Allegheny County.[38] ACHD found good agreement between modeled and observed $PM_{2.5}$ concentrations across Allegheny County. The results of the model performance evaluations can be referenced in Appendix G of the Commonwealth's September 30, 2019 SIP.

[36] *See* Appendix B of the September 30, 2019 SIP submittal "*Meteorological Analysis."*
[37] *See* SMOKE model, at https://www.cmascenter.org/smoke/.
[38] *See* AMET software at: https://www.cmascenter.org/amet/.

ACHD used MATS with the CAMx 2011 and 2021 modeling results to obtain 2021 projected attainment year design value concentrations at all of the FRM monitoring sites within the modeling domain. This included some monitoring sites outside the Allegheny County $PM_{2.5}$ nonattainment area. Allegheny County's projected 2021 $PM_{2.5}$ concentrations are summarized in Table 5 and include a breakdown of each modeled $PM_{2.5}$ component (2021 projected value is the sum of all the $PM_{2.5}$ components).

Table 5 - Projected 2021 CAMx Modeled Values for the 2012 $PM_{2.5}$ NAAQS for Allegheny County Area Monitors (based on a 1.33 km grid)

Allegheny County Area 24-Hour Design Values**

Monitoring Site	CAMx Projected Design Value and $PM_{2.5}$ Modeled Components (1.333 km grid)								
	Actual 2016-18 DV	Projected 2021 DV	OPP	EC	NH_4	OCmb	SO_4	NO_3	NaCl
Avalon	20.2	21.4	0.606	0.965	2.191	9.064	3.258	3.564	0.150
Clairton	18.7	21.4	0.869	3.542	1.882	7.753	4.464	0.828	0.038
Harrison	20.0	20.7	0.870	1.348	1.809	8.807	4.917	0.862	0.055
Lawrenceville	18.4	20.4	1.000	0.996	1.855	8.723	4.334	1.480	0.087
Liberty	34.9	38.6	1.248	3.910	2.520	21.634	4.978	2.253	0.060
North Braddock	24.5	23.4	1.178	2.564	2.353	8.304	4.577	2.403	0.096
North Park	15.6	17.3	1.280	0.948	1.537	6.783	4.272	0.585	0.047
South Fayette	18.3	18.4	1.188	1.480	1.613	6.952	4.552	0.700	0.039

Allegheny County Area Annual Design Values

Monitoring Site	CAMx Projected Design Value and $PM_{2.5}$ Modeled Components (1.333 km grid)								
	Actual 2016-18 DV	Projected 2021 DV	OPP	EC	NH_4	OCmb	SO_4	NO_3	NaCl
Avalon	9.7	10.0	0.398	0.508	0.772	4.727	1.926	0.566	0.028
Clairton	9.3	9.2	0.508	1.266	0.843	2.703	2.205	0.734	0.014
Harrison	9.6	9.4	0.495	0.633	0.856	3.470	2.219	0.689	0.026
Lawrenceville	9.1	9.0	0.483	0.530	0.810	3.395	1.999	0.614	0.032
Liberty	12.6	12.5	0.618	1.509	1.058	4.637	2.795	0.937	0.017
North Braddock	10.7	10.0	0.608	0.989	0.951	3.192	2.463	0.797	0.023

North Park	7.8	7.6	0.593	0.478	0.743	2.219	1.908	0.560	0.026
South Fayette	8.3	8.5	0.579	0.636	0.774	2.844	2.071	0.592	0.020

** 24-hour Design values are rounded to nearest whole number so Avalon's projected 2021 24-hour design value is 21 $\mu g/m^3$
Blank = Salt and passive component held constant from base to future case, OPP = other primary $PM_{2.5}$, EC = elemental carbon, NH4 = ammonium, OCmb = organic carbon mass (by) mass balance, SO4 = sulfate, NO3 = Nitrate, NaCl = "salt"

Modeled 2021 $PM_{2.5}$ design values for all monitors except the Liberty monitor meet the revised 2012 $PM_{2.5}$ NAAQS. All monitors in Allegheny County meet the 24-hour $PM_{2.5}$ NAAQS using 2018 design values. Only the Liberty monitor is projected to exceed the revised 2012 annual $PM_{2.5}$ NAAQS in 2021, based on the CAMx developed design values. Therefore, in accordance with EPA's modeling guidance, ACHD undertook a more refined local area analysis to better gauge emission control impacts for sources nearby the Liberty monitor in southern Allegheny County and the effect of controlling those sources on projected $PM_{2.5}$ concentrations in the Liberty monitor area. The Liberty monitor's location on elevated terrain several miles downwind of the U.S. Steel Clairton Coke Works complicates this analysis.

As stated in EPA's "Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze" ("Modeling Guidance"), "…there are numerous cases where local source contributions may not be dominant but are a sizable contributor to total annual average $PM_{2.5}$ at this monitor. In these cases, a more refined analysis of the contribution of local primary $PM_{2.5}$ sources to $PM_{2.5}$ at the monitor(s) will help explain the causes of nonattainment at and near the monitor and may lead to more efficient ways to attain the NAAQS by controlling emissions from local sources which may be important contributors to the violating area."[39] ACHD has done analysis of regional monitor concentrations and demonstrated unique industrial source influences

[39] EPA policy memo, *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze*, from Richard Wayland, dated November 29, 2018. See p. 134. Available at: https://epa.gov/ttn/scram/guidance/guide/O3-PM-RH-Modeling_Guidance-2018.pdf.

using source apportionment modeling[40] and concluded that the Liberty monitor, "shows a large contribution from carbon-rich industrial sources, not present at the other sites, that contribute carbons as well as primary sulfate and several trace elements."

EPA's Modeling Guidance allows the use of several tools to evaluate contributions of local $PM_{2.5}$ sources, such as Gaussian dispersion modeling. While dispersion models may not be an appropriate tool for determining secondary $PM_{2.5}$ or ozone concentrations, they work well for use in determining local primary $PM_{2.5}$ impacts.[41] ACHD utilized EPA's AERMOD model to conduct a local area analysis of the Liberty monitor area. The refined Liberty local analysis modeling used AERMOD to further resolve the impact of local area sources and meteorology beyond the CAMx analysis, to generate the final modeled design values at the Liberty monitor. This local area analysis shows that the Liberty monitor will attain by attainment deadline.

Finally, ACHD included additional information in its September 30, 2019 SIP revision constituting a "weight of evidence" demonstration to support its modeling analysis, per EPA's Modeling guidance.[42] ACHD's weight of evidence demonstration includes analysis of downward $PM_{2.5}$ monitoring trends at Allegheny County monitors, a listing of permanent stationary source shutdowns (not reflected in the modeling analysis), $PM_{2.5}$ precursor reductions of SO_2 resulting from reductions in neighboring areas, emission reductions due to population decrease projections, and emission reductions due to voluntary programs (not included in the SIP). Also, additional EGU deactivations in Pennsylvania and surrounding states were announced after EGU forecasting was performed (based on 2015 data). These deactivations, which were not included in the air

[40] *See* Appendix C of the September 30, 2019 SIP Revision, "Speciation and Source Apportionment Analysis."
[41] *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze*, from Richard Wayland, dated November 29, 2018, at p. 134.
[42] See pp. 169-171 of EPA's *Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze*, which outlines several other analyses that could be included in any attainment demonstration to help bolster results from the primary modeling analysis. These could include additional modeling analyses, analyses of trends in ambient air quality and emissions, and additional emissions controls/reductions.

quality modeling for this plan, will lead to further reductions of $PM_{2.5}$ precursor emissions that potentially contribute $PM_{2.5}$ emissions to Allegheny County. Further information on recent planned EGU deactivations can be found in Section 11.4 of the Allegheny County $PM_{2.5}$ Plan.

3. EPA's Evaluation and Proposed Action on Modeling

EPA has reviewed the modeling demonstration prepared by ACHD for the Allegheny County $PM_{2.5}$ nonattainment area. EPA also reviewed the supporting local area AERMOD dispersion model analysis prepared by ACHD to assess the impact of sources closest to the Liberty monitor. ACHD modeling protocols covering the Weather Research and Forecasting (WRF) prognostic meteorological model, the CAMx modeling domains and the AERMOD local area analysis all comport with EPA's Modeling Guidance.[43]

With the exception of the Liberty monitor, the CAMx model projected 2021 $PM_{2.5}$ design values for all monitors in Allegheny County are projected to be below the NAAQS by the attainment deadline. ACHD elected to conduct a refined local area assessment to further assess the impact of several large nearby sources beyond the scope of the CAMx modeling. The Allegheny County Plan contains ACHD's arguments supporting its contention that the CAMx 1.333 km modeling analysis could be overestimating projected 2021 $PM_{2.5}$ concentrations at the Liberty monitor.[44] These CAMx modeling limitations cited include: Limitations in CAMx's ability to properly characterize concentration gradients across the 1.333 km grid cells, failure to use the most up to date available stack test emissions data and stack test emission calculations for several key sources in the area, improper CAMx source characterizations, and improper source apportionment by CAMx.

EPA proposes to agree with ACHD's assessment that these are reasonable arguments to

[43] Ibid.

[44] *See* Appendix F.3 of the September 30, 2019 SIP revision.

support use of a supplemental local area analysis using AERMOD dispersion modeling to refine projected 2021 model concentrations at the Liberty monitor. Final projected 2021 values at the Liberty monitor using the local area analysis were 35 µg/m^3 (24-hour) and 12.0 µg/m^3 (annual), which demonstrate attainment with the 2012 $PM_{2.5}$ NAAQS.

Given that the projected 2021 $PM_{2.5}$ concentrations at the Liberty monitor just meet the 2012 $PM_{2.5}$ NAAQS, ACHD's use of additional supporting information via a weight of evidence demonstration is warranted. The Allegheny County Plan contains a monitor value trends analysis showing statistically significant downward trends at all of its $PM_{2.5}$ monitoring sites, including the Liberty monitor. EPA agrees with ACHD's contention that the Pennsylvania Jersey Maryland Power Pool (PJM Interconnection, or simply PJM) forecasts of electric generation for the last few years have overestimated the actual amount of electric generation needed, and as a result the projected regional $PM_{2.5}$ precursor emissions from the electric generation sector are likely overestimated.[45] Electricity generation and demand reports from PJM indicate a decline in coal-fired power plant operations and an increase in power generation share from a rise in number and capacity of lower emission producing, more efficient combined-cycle natural gas plants. This trend is leading to significant reductions in regional emissions of SO_2, a precursor to $PM_{2.5}$.[46] It also appears that the CAMx model overestimates projections for some monitor locations in Allegheny County, as shown by the fact that actual measured 2018 $PM_{2.5}$ design values are already below forecast 2021 model projections. Allegheny County also documented additional local emission reductions and source shutdowns which were not accounted for in the projected emission inventories, along with other voluntary programs that could lead to additional emission reductions. The combination of these weight of evidence impacts should lead to continued

[45] *See* Appendix K of the September 30, 2019 SIP revision.
[46] *See* Section 3, page 104, http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2018.shtml.

reductions in $PM_{2.5}$ monitor concentrations in Allegheny County.

EPA believes ACHD's modeling demonstration shows that its projected 2021 $PM_{2.5}$ design values will likely comply with the 2012 $PM_{2.5}$ NAAQS – particularly since the actual 2018 $PM_{2.5}$ design values at all monitoring sites in Allegheny County (except the Liberty monitor) meet the 2012 $PM_{2.5}$ NAAQS. Allegheny County's unmonitored area analysis attempts to more accurately ensure attainment over the entire county and not just those portions covered by the monitoring network. Given the results of ACHD's CAMx modeling for the area, the refined AERMOD local area assessment, and the additional emission reductions and other supporting arguments from ACHD's weight of evidence demonstration, EPA supports ACHD's finding that $PM_{2.5}$ design values at the Liberty monitor will meet the 2012 $PM_{2.5}$ NAAQS by the December 31, 2021 attainment date.

E. Attainment Demonstration

1. Requirements for an Attainment Demonstration

CAA section 189(a)(1)(B) requires that each state in which a Moderate $PM_{2.5}$ nonattainment area is located submit an attainment plan that includes, among other things, either a demonstration (including air quality modeling) that the plan will provide for attainment by the applicable attainment date, or a demonstration that attainment by such date is impracticable. In addition, CAA section 172(c)(1) generally requires, for each nonattainment area, a plan that provides for the implementation of all RACM and RACT as expeditiously as practicable and provides for attainment of the NAAQS. EPA interprets these two provisions together to require that an attainment demonstration for a Moderate $PM_{2.5}$ nonattainment area meet the following criteria: 1) the attainment demonstration must show the projected attainment date for the area that is as expeditious as practicable; 2) the attainment demonstration must meet the requirements of 40

CFR part 51, appendix W and must include inventory data, modeling results, and emission reduction analyses on which the state has based its projected attainment date; 3) the base year for the emissions inventory required for the attainment demonstration must be one of the three years used for designations or another technically appropriate inventory year; and 4) the control strategies modeled as part of the attainment demonstration must be consistent with the control strategy requirements under 40 CFR 51.1009(a), including the requirements for RACM/RACT and additional reasonable measures.[47]

In addition, the attainment demonstration must provide for the implementation of all control measures needed for attainment as expeditiously as practicable, but no later than the beginning of the year containing the applicable attainment date.[48]

2. Attainment Demonstration in the Allegheny County $PM_{2.5}$ Plan

As explained in section III.D of this document, ACHD's $PM_{2.5}$ SIP includes a modeling demonstration, based on modeling using currently implemented emission control measures, that shows that monitors in Allegheny County, Pennsylvania will comply with both the 24-hour and the annual $PM_{2.5}$ standards by December 31, 2021. The modeling for the Allegheny County $PM_{2.5}$ nonattainment area focuses on regional impacts from $PM_{2.5}$ precursors and localized impacts from primary $PM_{2.5}$ sources. ACHD also conducted an unmonitored area analysis to better refine those areas of Allegheny County further from the air monitor sites, as was discussed earlier in section III.D of this document pertaining to the modeling.

The attainment plan includes a weight of evidence analysis to further bolster the attainment demonstration. The plan shows reductions in $PM_{2.5}$ emissions and $PM_{2.5}$ precursor emission inventories between 2011 and 2021 as a result of implementation of RACT/RACM,

[47] *See* EPA's $PM_{2.5}$ Implementation Rule, at 40 CFR 51.1011(a).
[48] Id.

stationary source shutdowns (not reflected in the 2011 inventory), and from implemented state, local, and Federal emission controls.

ACHD contends that the results from their modeling analysis, as well as its weight of evidence supplemental analysis, demonstrate that all monitors in Allegheny County will attain the revised 2012 24-hour and annual $PM_{2.5}$ NAAQS by the statutory date (December 31, 2021).

3. EPA's Evaluation of ACHD's $PM_{2.5}$ Attainment Demonstration

EPA evaluated whether ACHD has adequately demonstrated that the Allegheny County Area meets EPA requirements for demonstration of attainment, as described here:

a. The attainment demonstration must show the projected attainment date for the area that is as expeditious as practicable.

As discussed in section III.D of this preamble, EPA proposes to find that the modeling demonstration and additional analysis in the attainment plan show that the area will achieve the 2012 $PM_{2.5}$ NAAQS by the attainment date. In its review of RACM measures, ACHD found no additional measures that, if enacted, would advance the attainment deadline earlier than the December 31, 2021 attainment deadline. Currently, 2018 $PM_{2.5}$ design values at all monitoring sites in Allegheny County except Liberty meet the 2012 $PM_{2.5}$ NAAQS. Allegheny County's unmonitored area analysis predicts attainment over the entire County. Given the results of the refined local area analysis, ACHD's analysis of potential model overestimations, and additional emission reductions identified as part of the weight of evidence demonstration (that are not included in the modeling demonstration), EPA concludes that attainment demonstration modeling reasonably projects that all the monitors in the area will meet the 2012 $PM_{2.5}$ NAAQS by the 2021 projected attainment date and that attainment prior to that date is not practicable.

b. The attainment demonstration must meet the requirements of 40 CFR part 51, appendix

W and must include inventory data, modeling results, and emission reduction analyses on which the state has based its projected attainment date;

Based on our analysis of the attainment modeling demonstration in section III.D of this document, EPA also proposes to conclude that the attainment demonstration modeling includes appropriate modeling analysis information complying with the requirements of 40 CFR part 51, appendix W. Based on EPA's review of the supporting $PM_{2.5}$ and $PM_{2.5}$ precursor emission inventories (as described in the emission inventory section of this action), EPA also proposes to conclude that the plan includes appropriate emission inventory data to meet the related EPA emission inventory requirements.

c. The base year for the emissions inventory required for the attainment demonstration must be one of the three years used for designations or another technically appropriate inventory year; and

ACHD selected 2011 as its base year for the emissions inventory used for the attainment demonstration. Since 2011 is one of the three years (i.e., 2011-2013) used for designation purposes, EPA finds that this choice of base year for the attainment demonstration meets EPA requirements.

d. The control strategies modeled as part of the attainment demonstration must be consistent with the control strategy requirements under 40 CFR 51.1009(a), including the requirements for RACM/RACT and additional reasonable measures.

Based on our review of ACHD's attainment demonstration modeling, EPA proposes to find that the air quality modeling meets the requirements of 40 CFR 51.1011(a) and accounts for all technically and economically feasible control measures for direct $PM_{2.5}$ (as well as $PM_{2.5}$ precursor) emissions sources upon which PADEP and ACHD have based their projected

attainment date for the area. 40 CFR 51.1009(a) and 40 CFR 51.1011.

As part of the RACT/RACM determination (in conjunction with the accompanying weight of evidence demonstration emission reductions), EPA proposes to conclude that the control strategies modeled as part of the attainment demonstration are consistent with the control strategy requirements under 40 CFR 51.1009(a), including the requirements for RACM/RACT and additional reasonable measures. Based on the RACT/RACM analysis and the additional weight of evidence demonstration for $PM_{2.5}$ and $PM_{2.5}$ precursor emission reductions, EPA believes the attainment modeling analysis shows that the projected December 31, 2021 attainment date for the area is as expeditious as practicable.

e. The attainment demonstration must provide for the implementation of all control measures needed for attainment as expeditiously as practicable, but no later than the beginning of the year containing the applicable attainment date.

In Section 3 (Control Strategy) of the Allegheny County $PM_{2.5}$ Plan, ACHD sets out its attainment control strategy. ACHD incorporated the controls described in Section 3 in the future case 2021 emissions and modeling inventories for the attainment demonstration. These controls include local source modifications, local source shutdowns, and regional controls. ACHD states that the local source modifications are Federally enforceable through ACHD installation permits and operating permits. These local source modifications are fully implemented, and the shutdowns all occurred after the 2011 base year, but prior to the submittal of the plan. The regional controls include various Federal control measures as well as two Pennsylvania statewide measures related to sulfur limits for commercial fuel oil and VOC limits for adhesives and sealants. These regional measures are also fully implemented.

EPA has evaluated ACHD's control strategy for attainment and found that all control

measures needed for attainment have been implemented has expeditiously as practicable. The attainment date is December 31, 2021. These controls were all implemented prior to PADEP submitting the September 30, 2019 SIP revision. Therefore, EPA concludes that the control measures were implemented well before the beginning of the year containing the applicable attainment date, 2021.

4. EPA's Proposed Action on the $PM_{2.5}$ Attainment Demonstration

EPA proposes to conclude that the attainment demonstration for the Allegheny County $PM_{2.5}$ Plan meets the requirements for a moderate area plan under CAA section 189(a)(1)(B), and that this plan contains an approvable demonstration (including air quality modeling) showing that the plan provides for attainment by the applicable attainment date. EPA also proposes to conclude that this plan meets CAA section 172(c)(1) requirements to provide for the implementation of RACM and RACT as expeditiously as practicable and provides for attainment of the NAAQS. By meeting these requirements, EPA proposes to conclude that ACHD's plan for the Allegheny County $PM_{2.5}$ area meets applicable requirements for an approvable attainment demonstration for a Moderate $PM_{2.5}$ nonattainment area.

F. Reasonable Further Progress (RFP)

1. Requirements for Ensuring Reasonable Further Progress

CAA section 172(c)(2) states that all nonattainment area plans shall demonstrate reasonable progress towards attainment. In addition, CAA section 189(c) requires that all $PM_{2.5}$ nonattainment area SIPs include a QM demonstration, to be achieved every three years until the area is redesignated to attainment and which demonstrate RFP, as defined in CAA section 171(l). Section 171(l) defines RFP as "such annual incremental reductions in emissions of the relevant air pollutant as are required by part D or may reasonably be required by the

Administrator for the purpose of ensuring attainment of the applicable [NAAQS] by the applicable date." Neither subpart 1 nor subpart 4 of part D, title I of the Act requires that a set percentage of emissions reductions be achieved in any given year for purposes of satisfying the RFP requirement. EPA's SIP requirements rule does not require a specific RFP related inventory, but the attainment projected inventory for the nonattainment area also may serve a purpose for evaluation of RFP.[49]

For purposes of the $PM_{2.5}$ NAAQS, EPA has interpreted the RFP requirement to require that nonattainment area plans show annual incremental emission reductions sufficient to maintain generally linear progress toward attainment by the applicable deadline.[50] As discussed in EPA guidance in the Addendum to the General Preamble (or "the Addendum"),[51] requiring linear progress in reductions of direct $PM_{2.5}$ and any individual precursor in a $PM_{2.5}$ plan may be appropriate in situations where: The pollutant is emitted by a large number and range of sources; the relationship between any individual source or source category and overall air quality is not well known; a chemical transformation is involved (*e.g.*, secondary particulate significantly contributes to $PM_{2.5}$ levels over the standard); and/or the emission reductions necessary to attain the $PM_{2.5}$ standard are inventory-wide.[52]

The Addendum indicates that requiring linear progress may be less appropriate in other situations, such as: Where there are a limited number of sources of direct $PM_{2.5}$ or a precursor; where the relationships between individual sources and air quality are relatively well defined; and/or where the emission control systems utilized will result in swift and dramatic emission reductions.

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[49] *See* EPA $PM_{2.5}$ Implementation Rule. 81 FR 58029, August 24, 2016.
[50] Addendum to the General Preamble at p. 42015. 59 FR 41998, August 16, 1994.
[51] Id.
[52] Id.

In nonattainment areas characterized by any of these latter conditions, RFP may be better represented as stepwise progress as controls are implemented and achieve significant reductions soon thereafter. For example, if an area's nonattainment problem can be attributed to a few major sources, EPA guidance indicates that "RFP should be met by adherence to an ambitious compliance schedule, which is likely to periodically yield significant emission reductions of direct $PM_{2.5}$ or a $PM_{2.5}$ precursor."[53] This latter case is applicable to the Allegheny County Area, as the violating monitor is impacted heavily by nearby major emission sources, which are implementing controls in a stepwise fashion between the base year and attainment deadline.

Where attainment is driven by regulatory compliance, the $PM_{2.5}$ attainment plan should include a detailed schedule for compliance with regulations in the area and provide corresponding annual emission reductions to be realized from each milestone in the schedule.[54] In reviewing an attainment plan under CAA subpart 4, EPA considers whether the annual incremental emission reductions to be achieved are reasonable in light of the statutory objective of timely attainment. States should consider both cost-effectiveness and pollution reduction effectiveness when developing implementation schedules for its control measures and may implement measures that are more effective at reducing $PM_{2.5}$ earlier to provide greater public health benefits.[55]

The $PM_{2.5}$ SIP Requirements Rule establishes specific regulatory requirements for purposes of satisfying the Act's RFP requirements and provides related guidance in the preamble to the rule. Specifically, under the $PM_{2.5}$ SIP Requirements Rule, each $PM_{2.5}$ attainment plan must contain an RFP analysis that includes, at minimum: 1) an implementation schedule for control measures; 2) RFP projected emissions for direct $PM_{2.5}$ and all $PM_{2.5}$ plan precursors for

[53] Id at p. 42015.
[54] Id. at p. 42016.
[55] Id.

each applicable milestone year, based on the anticipated control measure implementation schedule; 3) a demonstration that the control strategy and implementation schedule will achieve reasonable progress toward attainment between the base year and the attainment year; and 4) a demonstration that by the end of the calendar year for each milestone date for the area, pollutant emissions will be at levels that reflect either generally linear progress or stepwise progress in reducing emissions on an annual basis between the base year and the attainment year.[56] States should estimate the RFP projected emissions for each milestone year by sector on a pollutant-by-pollutant basis.[57]

2. RFP Demonstration in the Allegheny County $PM_{2.5}$ Plan

The RFP demonstration and QM demonstration methodology are detailed in Section 7 of the Allegheny County $PM_{2.5}$ Plan. ACHD elected to try to show that nonattainment area emissions of direct $PM_{2.5}$ pollutants (and significant $PM_{2.5}$ precursor pollutants) decline from the base year to the attainment year, in a generally linear manner.

The Allegheny County Plan estimates that emissions of direct $PM_{2.5}$ will decline steadily from 2011 through 2021 and that emissions of direct $PM_{2.5}$ will generally remain below the levels needed to show incremental, continuing progress toward attainment. ACHD compiled RFP emissions inventories for the milestone years of 2019 and 2022 using the base and projected inventories used in the attainment demonstration. Milestone years are based on a schedule of 4.5 and 7.5 years after designation (years 2019 and 2022, respectively), as outlined in the $PM_{2.5}$ Implementation Rule for a moderate $PM_{2.5}$ nonattainment area.[58] Year 2019 emissions were

[56] 40 CFR 51.1012(a).
[57] *See* 81 FR 58010, 58056 (August 24, 2016).
[58] RFP milestones occur every three years, starting from the due date of the SIP (i.e., 18 months after designation), or 4.5 years and 7.5 after designation in 2015. The second milestone of 7.5 years, although beyond the attainment date for a moderate area, is included in the event the area (at a future date) is reclassified from moderate to serious nonattainment.

calculated by linearly interpolating base year 2011 and projected case 2021 emissions. Year 2022 emissions were held constant from the projected 2021 case, as a conservative approach beyond the expected attainment timeframe. In addition to direct $PM_{2.5}$ emissions, the RFP demonstration includes $PM_{2.5}$ precursor emissions of SO_2 and NO_x. However, it does not include VOC and NH_3 emissions as $PM_{2.5}$ precursors because those emissions were shown to be insignificant for purposes of the Allegheny County Plan. The direct $PM_{2.5}$ emissions for the baseline, milestone, and attainment years are shown in Table 6 (with $PM_{2.5}$ broken down into filterable and condensable components).[59] The precursor emissions are shown in Tables 7 and 8.

Table 6 – Direct $PM_{2.5}$ RFP Emissions Inventory for Allegheny County, By Milestone Year (tons/year)

Year	Base Year 2011			Milestone Year 2019			Projected Attainment 2021			Milestone Year 2022		
	$PM_{2.5}$	$PM_{2.5}$ (filter)	$PM_{2.5}$ (cond)	$PM_{2.5}$	$PM_{2.5}$ (filter)	$PM_{2.5}$ (cond)	$PM_{2.5}$	$PM_{2.5}$ (filter)	$PM_{2.5}$ (cond)	$PM_{2.5}$	$PM_{2.5}$ (filter)	$PM_{2.5}$ (cond)
Point Sources	2,503	1,338	1,164	2,305	1,272	1,032	2,256	1,256	999	2,256	1,256	999
Area Sources	2,491	2,011	480	2,665	2,183	473	2,708	2,226	472	2,708	2,226	472
Non-road Mobile Sources	361	361	0	259	259	0	234	234	0	234	234	0
On-road Mobile Sources	450	450	0	303	303	0	266	266	0	266	266	0
Fires	24	24	0	24	24	0	24	24	0	24	24	0
Biogenic	0	0	0	0	0	0	0	0	0	0	0	0
Total	5,829	4,185	1,644	5,556	4,042	1,505	5,488	4,007	1,471	5,488	4,007	1,471

Table 7 - Allegheny County SO2 Precursor RFP Emissions Inventory, By Milestone Year (tons/year)

	Baseline 2011	Milestone 2019	Projected Attainment 2021	Milestone 2022
Stationary Point Sources	13,460	7,429	5,921	5,921

[59] *See* corresponding Tables 7.1, 7.2, and 7.3 of Pennsylvania's September 30, 2019 SIP revision.

Area Sources	1,528	1,169	1,079	1,079
Non-road Mobile Sources	11	6	5	5
On-road Mobile Sources	78	41	31	31
Fires	2	2	2	2
Biogenic Sources	0	0	0	0
Total	15,080	8,647	7,039	7,039

Table 8 – Allegheny County NOx Precursor RFP Emissions Inventory (tons/year)

	Baseline 2011	Milestone 2019	Projected 2021	Milestone 2022
Stationary Point Sources	11,128	8,568	7,928	7,928
Area Sources	6,979	6,727	6,664	6,664
Non-road Mobile Sources	3,921	2,554	2,212	2,212
On-road Mobile Sources	13,259	7,218	5,708	5,708
Fires	5	5	5	5
Biogenic Sources	166	166	166	166
Total	35,460	25,239	22,684	22,684

Allegheny County then compared these RFP inventory projections against the most currently available National Emissions Inventory (NEI) data (i.e., 2017 for stationary point source and 2014 for mobile and area emissions) to track the progress of their actual emissions against their 2019 milestone year shown in Table 9.[60]

Table 9 - Allegheny County Composite Emissions Inventory, Based on Most Recent Available NEI Data (tons/year)

	$PM_{2.5}$	$PM_{2.5}$ (filter)	PM2.5 (cond)	SO_2	NO_x
Point Sources (2017 NEI)	1,305	775	530	4,712	6,148

[60] *See* Table 7.4 of the September 30, 2019 SIP revision.

Area Sources (2014 NEI)	2,646	2,174	473	481	8,687
Non-road Mobile Sources (2014 NEI)	315	315	0	8	3,183
On-road Mobile Sources (2014 NEI)	389	389	0	76	11,754
Fires (2011 NEI)	24	24	0	2	5
Biogenic Sources (2011 NEI)	0	0	0	0	166
Total	4,679	3,677	1,003	5,279	29,943

While the NEI dates do not directly correspond to the 2019 RFP milestone year, the composite inventory shows that Allegheny County is already meeting their projected $PM_{2.5}$ and SO_2 emissions. While NO_x was not yet meeting the 2019 milestone based on actual emissions data, additional NO_x reductions from mobile sources that occur after 2014 are expected to close the gap between 2014 (when the latest mobile NEI data was available) and the 2019 projected NO_x milestone.

ACHD attempted to show that linear progress towards attainment is being made by examining its monitoring data and its point source emissions data for the period between the base and attainment years, achieved by performing a linear regression on this data to show yearly progress. Monitored concentrations are presented in Tables 10 and 11, showing the annual and 24-hour $PM_{2.5}$ design values, respectively, for each Allegheny County site for years 2011 through 2018.[61]

[61] See Tables 7.5 and 7.6 in the September 30, 2019 SIP revision.

Table 10 - Monitored Annual $PM_{2.5}$ Design Values (µg/m³) for Allegheny County Monitor Sites, with Linear Progress Rates

Monitor Site	Monitored Annual Design Value (µg/m³)								Yearly Rate of Linear Progress
	2011	2012	2013	2014	2015	2016	2017	2018	
Liberty	15.0	14.8	13.4	13.0	12.6	12.8	13.0	12.6	-0.33
Avalon	14.7	13.4	11.4	10.6	10.6	10.4	10.2	9.7	-0.64
North Braddock	12.7	12.5	11.7	11.4	11.2	11.0	10.8	10.7	-0.30
Harrison	12.4	11.7	10.6	10.0	9.8	9.8	9.8	9.6	-0.38
Lawrenceville	11.6	11.1	10.3	10.0	9.7	9.5	9.2	9.1	-0.35
Clairton	11.5	10.9	9.8	9.5	9.9	9.8	9.8	9.3	-0.24
South Fayette	11.0	10.5	9.6	9.0	8.8	8.5	8.4	8.3	-0.39
North Park	9.7	9.4	8.8	8.5	8.5	8.2	8.2	7.8	-0.25

Table 11 - Monitored 24-Hour $PM_{2.5}$ Design Values, with Linear Progress Rates (µg/m³)

Allegheny County Monitor Site	Monitored 24-Hour Design Value (µg/m³)								Linear Progress Yearly Rate
	2011	2012	2013	2014	2015	2016	2017	2018	
Liberty	44	43	37	35	33	36	37	35	-1.2
Avalon	34	29	25	22	23	22	21	20	-1.7
North Braddock	34	33	29	26	25	25	24	24	-1.5
Harrison	30	28	25	22	22	21	21	20	-1.4
Clairton	28	26	22	23	25	26	22	19	-0.8
Lawrenceville	27	26	23	21	21	20	19	18	-1.3
South Fayette	27	26	24	20	21	19	19	18	-1.3
North Park	25	23	19	17	18	18	17	16	-1.1

ACHD's analysis of historical monitored $PM_{2.5}$ design values shows that all sites in Allegheny County are achieving roughly linear reductions from baseline case through the most recently available monitor data. All sites are already below the NAAQS on both annual and 24-hour bases, with the exception of the Liberty monitor (for the annual $PM_{2.5}$ NAAQS). Based on

the linear annual rate of 0.33 $\mu g/m^3$ improvement (for annual design values), ACHD expects the Liberty monitor to achieve the annual NAAQS by 2021. Based on the linear yearly rate of 1.2 $\mu g/m^3$ for 24-hour design values, ACHD expects that the Liberty monitor will continue to achieve the 24-hour standard.

EPA's Implementation Rule requires attainment plans to provide an implementation schedule containing regulatory implementation timeframes showing progress towards attainment. However, ACHD did not present a schedule, contending that because all control measures identified for the Allegheny County Plan have already been implemented, and there are no identified RACM/RACT or "additional control measures" to be implemented, a schedule for implementation of controls is not applicable to this SIP.

3. EPA's Evaluation of and Proposed Action on RFP

For direct $PM_{2.5}$, EPA agrees that ACHD has shown steady progress towards measuring RFP for the 2012 $PM_{2.5}$ NAAQS in the Allegheny County area. ACHD has shown that the measures being implemented in the area show ongoing progress towards achieving the NAAQS.

ACHD has established milestones for comparison of emissions and monitored values corresponding to the milestone compliance demonstration timeframes discussed in the QM and has demonstrated that it has achieved its RFP related milestone requirements for the area. Monitored ambient values in the area are trending downward at a steady, if not linear rate, and ACHD has demonstrated that both emission reductions and monitor values (for both the annual and 24-hour $PM_{2.5}$ NAAQS) are expected to continue to decrease through the 2019 milestone deadline and the 2021 attainment deadline.

As discussed in the precursors section of this proposed document (section III.B), EPA is proposing to determine that SO_2 and NO_x are significant precursors in the Allegheny County area,

but that VOCs and NH_3 are insignificant $PM_{2.5}$ precursors that do not contribute significantly to ambient $PM_{2.5}$ levels in the area.

The Allegheny County $PM_{2.5}$ Plan documents ACHD's assertion that they are implementing all reasonable RACM and RACT and additional reasonable measures for direct $PM_{2.5}$ as expeditiously as practicable. The plan projects levels of direct $PM_{2.5}$ emissions in 2019 and 2022 that reflect full implementation of the Commonwealth's and ACHD's attainment control strategy for direct $PM_{2.5}$ and $PM_{2.5}$ precursors. ACHD's comparison of the most recently available NEI emissions data with the projections for 2019 and 2022 in the plan show that emissions are falling at expected rates to achieve RFP, and (with the exception of NO_x), most emissions are at or below 2021 projected levels (and are expected to continue to drop with continued implementation of control measures identified in the plan).[62] Stationary source controls in the area include controls at the U.S. Steel Clairton Coke Works (the largest modeled emission source of $PM_{2.5}$ in the area), including installation of new low-emission quench towers in 2013, replacement of an older coking battery in 2012, and new baffle washing requirements implemented in 2012. Other stationary source controls in the area include addition of flue gas desulfurization at the GenOn Cheswick coal fired EGU, arc furnace improvements and replacements at several area steel manufacturing facilities, etc. Further, a number of facilities in the area have been permanently shut down and have surrendered their permits, including: The Shenango Coke facility, the Guardian and GE Bridgeville glass plants, Bakerstown Container, and Allegheny Aggregates, among others.[63] In addition, new mobile source NO_x controls and the replacement of older, higher emitting mobile sources with new, lower-emitting mobile sources

[62] *See* section 3.0 of this document for a list of current control measures in the Allegheny County area, including new stationary source controls and source shutdowns in the area.

[63] *See* Section 3 of ACHD's plan in the September 30, 2019 SIP revision for a complete listing of implemented $PM_{2.5}$ and $PM_{2.5}$ precursor control strategies.

due to fleet turnover are expected to continue to reduce NO_x emissions between the 2014 NEI and the 2019 and 2022 future milestone cases.

In the case of an RFP demonstration based solely on linear reductions in emissions through the attainment deadline, EPA expects that, so long as the attainment date is as expeditious as practicable, then generally linear progress toward attainment by that date would satisfy the RFP requirement.[64]

Thus, EPA proposes to find that the Allegheny County $PM_{2.5}$ Plan demonstrates that emissions of direct $PM_{2.5}$ will be reduced at rates representing generally linear progress towards attainment. EPA also proposes to find that the plan demonstrates that all reasonable measures that provide the bases for the direct $PM_{2.5}$ emissions projections in the RFP analysis are being implemented as expeditiously as practicable. Accordingly, we propose to determine that the plan requires the annual incremental reductions in emissions of direct $PM_{2.5}$ (and significant precursors of $PM_{2.5}$) that are necessary to ensure RFP towards attainment of the 2012 annual $PM_{2.5}$ NAAQS by 2021, in accordance with the requirements of CAA sections 171(1) and 172(c)(2).

G. Quantitative Milestone (QM) Demonstration

1. Requirements for a QM Demonstration

Section 189(c) requires that attainment plans include milestones to demonstrate that RFP is being achieved on a timely basis. The purpose of the QM demonstration is to allow for periodic evaluation of the area's progress towards attainment of the NAAQS consistent with RFP requirements. Because RFP is an annual emission reduction requirement while the QMs are to be achieved every three years, when a state demonstrates compliance with the QM, it demonstrates that RFP has been achieved during each of the relevant three years. QMs provide an objective

[64] *See* EPA's $PM_{2.5}$ Requirements Rule at 81 FR 58056, August 24, 2016.

means to evaluate progress toward attainment, *e.g.*, through imposition of emission controls in the attainment plan and the requirement to quantify those required emission reductions.

The CAA does not specify the starting point for counting the three-year periods for QMs under CAA section 189(c). In the General Preamble and Addendum, EPA interpreted the CAA to require that the starting point for the first three-year period be the due date for the Moderate area plan submission.[65] Consistent with this longstanding interpretation of the Act, the $PM_{2.5}$ SIP Requirements Rule requires that each plan for a Moderate $PM_{2.5}$ nonattainment area contain QMs to be achieved no later than milestone dates 4.5 years and 7.5 years from the date of designation of the area.[66] Because EPA designated the Allegheny County area nonattainment for the 2012 annual $PM_{2.5}$ NAAQS effective April 15, 2015, the applicable QM dates for purposes of the Allegheny County $PM_{2.5}$ Plan are October 15, 2019 and October 15, 2022.[67]

The CAA requires states to submit QM reports (due 90 days after each milestone). Under EPA's $PM_{2.5}$ implementation rule,[68] a submitted QM report must include, at minimum: 1) a certification by the Governor (or Governor's designee) that the SIP control strategy is being implemented consistent with the RFP plan, as described in the applicable attainment plan; 2) technical support, including calculations, sufficient to document completion statistics for appropriate milestones and to demonstrate that the QM has been satisfied and how the emissions reductions achieved to date compare to those required or scheduled to meet RFP; and 3) a discussion of whether the area will attain the applicable $PM_{2.5}$ NAAQS by the projected attainment date for the area.[69] These reports should include calculations and any assumptions

[65] General Preamble, 57 FR 13539 (April 16, 1992); and Addendum, 59 FR 42016 (August 16, 1994).
[66] 40 CFR 51.1013(a)(1).
[67] 80 FR 2206 (January 15, 2015).
[68] 81 FR 58010 (August 24, 2016) (codified at 40 CFR part 51, subpart Z).
[69] 40 CFR 51.1013(b).

made by the state concerning how RFP has been met, *e.g.*, through quantification of emission reductions to date.[70]

2. QM Demonstration in the Allegheny County $PM_{2.5}$ Plan and 2019 QM Report

a. Allegheny County Area QM Demonstration

The September 30, 2019 SIP revision describes ACHD's approach to demonstrating compliance with the QM requirements of CAA section 189, in which measured air quality concentrations, as well as future projected air quality concentrations, are used to satisfy the milestone reporting requirement. For the Allegheny County moderate $PM_{2.5}$ nonattainment area, these QMs must to be reported to EPA for the milestone years 2019 and (if applicable) 2022. The QM report for year 2019 was due January 14, 2020 (i.e., 90 days after the first milestone date of October 15, 2019). The second report for the 2022 milestone would be required only if the area failed to attain the NAAQS by its 2021 attainment date and were to be reclassified to a serious area. In that case, a 2022 milestone report would be due by January 14, 2023.

Because the Liberty monitor was the only monitor in the Allegheny County area not meeting the 2012 annual $PM_{2.5}$ NAAQS when EPA designated the area nonattainment and is currently not meeting the NAAQS, ACHD based its QMs on the design values for the Liberty monitor. For the 2019 QM demonstration in the September 20, 2019 SIP, ACHD calculated the expected design values at the Liberty monitor based on a linear regression over a 10-year timeframe (from 2011 to the 2021 attainment year). The air quality modeling in the Allegheny County Plan predicts that the area will attain the 2012 annual $PM_{2.5}$ NAAQS by its December 31, 2021 attainment deadline. ACHD assumed that the 2019-2021 design value at the Liberty monitor would be equal to the level of the 2012 annual $PM_{2.5}$ NAAQS, or 12 $\mu g/m^3$. Assuming

[70] Id. at pp. 42016-42017.

linear progress, ACHD calculated 2019 design values for the Liberty monitor for both the annual and 24-hour[71] $PM_{2.5}$ NAAQS in Table 12.

Table 12 - Liberty Monitor Air Quality Concentration Milestones (µg/m³)

Liberty Design Value	Base Year (2011)	Projected Year (2021)	Linear Yearly Rate	Milestone Year (2019)	Milestone Year (2022)
Annual	15.0	12.0	-0.3	12.6	12.0
24-Hour	44	35	-0.9	37	35

b. Allegheny County $PM_{2.5}$ Area 2019 QM Report

PADEP submitted the Allegheny County 2019 QM Report to EPA on January 14, 2020 and a supplement to that report dated April 8, 2020, (collectively, the 2019 QM Report). The 2019 QM Report includes air quality monitoring data reports from AQS showing that the 2016-2018 design values for the Liberty monitor met the milestone levels set forth in Table 12. In addition, the preliminary[72] 2017-2019 design values at the Liberty monitor are lower than the 2016-2018 design values. The data is presented in Table 13.

Table 13 - Liberty Monitor Design Values for the 2012 Annual and 24 Hour $PM_{2.5}$ NAAQS (in µg/m³)

NAAQS	2019 Milestone	2016-2018 Final	2017-2019 Preliminary
Annual	12.6	12.6	12.4
24-Hour	37	37	35

AQS reports submitted in the 2019 QM Report continue to show that all other monitors in the Allegheny County area have design values lower than those of the Liberty monitor. To demonstrate RFP is being met, as part of the 2019 QM Report ACHD verified that all controls

[71] The 24-hour $PM_{2.5}$ NAAQS is set at 35 µg/m^3.
[72] The 2019 data is fully validated and quality-assured, but not yet certified. The 2019 data must be certified by May 1, 2020, in accordance with 40 CFR 58.15.

listed as part of the plan's control strategy remain in place. Further, ACHD states that, "RFP is being achieved for Allegheny County and progress should continue toward attainment, to be achieved by the attainment date of December 31, 2021." Furthermore, PADEP concurred with ACHD's certification that the control strategy is being implemented in Allegheny County consistent with the RFP plan and that milestones are being achieved as included in the SIP.

In the attainment plan, ACHD developed the 2019 RFP milestone emissions inventory by linearly interpolating 2011 base year and projected 2021 attainment year emissions inventories used in its modeled attainment demonstration. In the 2019 QM report, ACHD presented updated actual emissions data for the stationary point source sector of the emissions inventory for 2017 and 2018, along with prior data for the 2011-2016 period, as listed in Table 14.

Table 14 - Annual Allegheny County Point Source Emissions for the Period 2011-2018, with Yearly Linear Progress Rates (in tons/year)

Pollutant	Point Source Emissions (tons/year)								Linear Progress Yearly Rate
	2011	2012	2013	2014	2015	2016	2017	2018	
$PM_{2.5}$	2,503	1,725	1,822	2,127	1,511	1,373	1,282	1,360	-145
SO_2	13,460	6,542	6,032	8,593	5,279	4,864	4,758	7,122	-716
NO_x	11,128	11,881	13,073	13,715	10,278	8,560	6,337	6,925	-882

Pursuant to 40 CFR 51.1013(b)(3), the QM report must include a discussion of whether the $PM_{2.5}$ NAAQS will be attained by the projected attainment date for the area. ACHD's 2019 QM report contains an evaluation of ambient air quality trends, meteorology, and emission control strategies. In the 2019 QM Report, ACHD concludes that it expects the area to attain the 2012 annual $PM_{2.5}$ NAAQS by the December 31, 2021 attainment date. The 2019 report also contains a trend analysis of the Liberty monitor showing a decline in monitored $PM_{2.5}$ concentrations through 2019. An accompanying analysis of quarterly means for the Liberty

monitor from 1999 to 2019 shows that the lowest quarterly means have occurred in the last four years, with three of the record-low quarters occurring in the last two years. The annual weighted $PM_{2.5}$ means for the Liberty monitor are shown in Table 15 for the 2009-2019 period.

Table 15 - Liberty Monitor Annual Weighted Mean Concentrations, 2009-2019

Metric	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Liberty weighted mean ($\mu g/m^3$)	15.0	16.0	14.0	14.3	12.0	12.7	12.9	12.8	13.4	11.5	12.2

Note: ACHD observes that concentrations are declining based on emission controls, but differences in the yearly concentrations at the Liberty monitor show dependence on the frequency and severity of inversions. Inversions were less frequent in 2013 and more prevalent in 2012 and 2017.

ACHD concludes that, based on monitored data, meteorology, and controls, ACHD expects that the Allegheny County Area will attain the 2012 annual $PM_{2.5}$ NAAQS by or before its December 31, 2021 attainment deadline.

3. EPA's Evaluation and Proposed Action on the QM Demonstration

EPA has reviewed the QM demonstration contained in the September 30, 2019 moderate area attainment plan for the Allegheny County Area, as well as the 2019 QM Report submitted to EPA on January 14, 2020 (as supplemented on April 8, 2020). This demonstration confirms that the monitored ambient air quality levels in the area satisfy EPA requirements for milestone levels.

The 2019 QM report shows that 2016-2018 design values for the Liberty monitor (the only monitor that did not meet the NAAQS since the area was designated nonattainment) met the milestone test established by ACHD in the attainment plan. Preliminary 2017-2019 design values at the Liberty monitor presented in the 2019 QM report are lower than the 2016-2018 design values. Finally, air quality data reports from EPA's AQS show that the 2016-2018 design values for the Liberty monitor met the QM levels set out in the attainment plan.

EPA has reviewed the RFP data presented in the 2019 QM Report and finds that the

Allegheny County area has made demonstrable progress in reducing emissions of $PM_{2.5}$ and $PM_{2.5}$ significant precursors since EPA designated the area nonattainment for the $PM_{2.5}$ NAAQS in 2015. Comparing stationary source emissions in the 2019 QM Report to those predicted in the attainment plan for 2019, EPA finds that the most recent emissions inventory is well below the RFP milestone. Therefore, EPA finds that emissions reductions are meeting RFP through the 2019 period.

EPA determined in an April 22, 2020 letter to PADEP that (based on its review of information contained in the plan and additional information provided in the 2019 QM report) ACHD has adequately demonstrated that the 2019 QMs for a moderate area plan have been met. The 2019 QM Report contains each of the required components to meet the QM requirements of CAA section 189(c)(2) and 40 CFR 51.1013(b).

For further information on EPA's review of the QM methodology and the 2019 QM Report, please refer to our TSD on the 2019 QM Report prepared in support of this action, which is available in the docket.[73]

H. Contingency Measures

1. Requirements for Contingency Measures

In accordance with section 172(c)(9) of the CAA, the $PM_{2.5}$ SIP Requirements Rule requires that attainment demonstrations for moderate $PM_{2.5}$ nonattainment areas include contingency measures.[74] Contingency measures are additional control measures to be implemented in the event that EPA determines that an area failed to meet RFP requirements (including associated QMs) or failed to attain the $PM_{2.5}$ primary standard by the applicable

[73] By letter dated April 22, 2020, from EPA Regional Administrator Servidio to PADEP Secretary McDonnell, EPA determined that ACHD adequately demonstrated that the 2019 QMs provided in the attainment plan have been met.
[74] *See* 40 CFR 51.1014 and 81 FR 58010 at p. 58066, August 24, 2016.

attainment date.

In order for contingency measures to be approvable as part of a state's $PM_{2.5}$ moderate area attainment plan, the measures must meet the following requirements set forth in the $PM_{2.5}$ SIP Requirements Rule and 40 CFR 51.1014: 1) the contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon a determination by the Administrator of the nonattainment area's failure to meet RFP, failure to meet any QM, failure to submit a QM report or failure to attain the standard by the applicable attainment date; 2) the plan must contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented with minimal further action by the state or by EPA;[75] 3) the contingency measures shall consist of control measures that are not otherwise included in the control strategy or that achieve emissions reductions not otherwise relied upon in the control strategy for the area; and 4) the contingency measures should provide for emissions reductions approximately equivalent to one year's worth of reductions needed for RFP.

2. Contingency Measures in the Allegheny County $PM_{2.5}$ Plan

Section 8 (Contingency Measures) of the Allegheny County $PM_{2.5}$ Plan identifies as contingency measures two actions for the mitigation of primary $PM_{2.5}$ from the U.S. Steel Clairton Plant that are to be implemented as the result of a July 27, 2019 settlement agreement and order (#19060) between ACHD and U.S. Steel. These actions, which include the installation of a cover and/or air curtain and the installation of a new combustion (under-firing) stack at the U.S. Steel Clairton Works, are to be implemented by May 1, 2020 and November 1, 2021,

[75] According to the $PM_{2.5}$ SIP Requirements Rule, states must show that the contingency measures can be implemented with minimal further action and no additional rulemaking actions, such as public hearings or legislative review. EPA generally expects all actions needed to effect full implementation of the contingency measures to occur within 60 days after EPA notifies the state of the area's failure to meet an RFP requirement or attain the NAAQS.

respectively. ACHD predicts that, based on additional modeling, these two actions will lead to a reduction in absolute annual modeled impacts of 0.10 µg/m^3 at the Liberty monitor (AQS Site ID 42-003-0064) and that the resulting 2022 $PM_{2.5}$ annual design value will be lowered by 0.07 µg/m^3. ACHD did not include these expected reductions in $PM_{2.5}$ emissions at the U.S. Steel Clairton facility in the emissions inventory portion of the Allegheny County $PM_{2.5}$ Plan.

3. EPA's Evaluation and Proposed Action on Contingency Measures

EPA does not consider the two actions contained in the July 27, 2019 settlement agreement and order to be suitable contingency measures. According to the $PM_{2.5}$ SIP Requirements Rule, "Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon a determination by the Administrator of the nonattainment area's failure to meet RFP, failure to meet any QM, failure to submit a QM report or failure to attain the standard by the applicable attainment date." 81 FR 58010 at 58066, August 24, 2016.

Contingency measures are to be implemented only if they are "triggered" in the event of the Administrator's determination that the Area failed to meet RFP requirements (including associated QMs) or failed to attain the $PM_{2.5}$ NAAQS by the applicable attainment date. The installation of the air curtain and stack at the U.S. Steel Clairton Coke Works will be implemented regardless of whether the Allegheny County Area fails to meet the RFP requirements or attain the $PM_{2.5}$ NAAQS by the attainment date. Measures that will be implemented regardless of being triggered are not considered appropriate to use as contingency measures. Therefore, EPA cannot fully approve Section 8 (Contingency Measures) of the Allegheny County $PM_{2.5}$ Plan because the two measures in the settlement agreement and order do not meet the contingency measures requirements of the $PM_{2.5}$ SIP Requirements Rule and 40 CFR 51.1014.

EPA informed ACHD of this concern prior to the publication of ACHD's proposed plan. In response, PADEP submitted a letter to EPA dated April 20, 2020, concurring with ACHD's commitment to adopt specific contingency measures and an attainment year MVEB in accordance with EPA's proposed conditional approval of those elements of the September 30, 2019 SIP revision. In its April 7, 2020 letter to PADEP, ACHD commits to adopt measures from the following list that will provide for a reduction of 34 tons per year of direct $PM_{2.5}$ emissions countywide (or an equivalent reduction in combination of $PM_{2.5}$ precursors), or 9.4 tons per year of $PM_{2.5}$ in the immediate vicinity of the Liberty monitor. Measures include implementation of the following at the U.S. Steel Clairton Coke Works: 1) increased residence times for the Pushing Emission Control (PEC) hoods during the pushing process (as described in ACHD Article XXI §2105.21.e.6) for batteries 1-3, 13-15, and 19-20; 2) increased baffle washing for the Quench Towers; 3) road and parking lot paving; and 4) improvements to the PEC baghouses. Additional potential measures include road paving on a portion of unpaved public county roads; adoption of an ordinance to restrict sale and use of heavy fuel oil and/or waste derived liquid fuel (WDLF) in Allegheny County; expansion of an existing wood stove change out program; repowering or replacement of tugboats and/or locomotives utilized by the U.S. Steel Mon Valley Works facilities; and replacement of locomotives at the McKeesport switchyard with new, cleaner equipment that meets the most recent standards.

After adopting measures, PADEP will submit a SIP revision, on behalf of ACHD, containing the adopted measures and meeting the requirements of the $PM_{2.5}$ SIP Requirements Rule and 40 CFR 51.1014. In addition, the contingency measures section will include a description of the trigger mechanisms and schedules for implementation of the contingency measures, as required by section 51.1014. ACHD and PADEP have committed to submit the

contingency measures SIP revision to EPA as expeditiously as possible, but no later than one year after the effective date of EPA's final notice of conditional approval of the September 30, 2019 SIP revision.

However, as stated previously, the expected emission reductions from the installation of the air curtain and stack at the U.S. Steel Clairton Coke Works were not included in the emissions inventory included in the Allegheny County $PM_{2.5}$ Plan. Therefore, it is expected that these actions will provide for additional emission reductions beyond those projected in the Allegheny County $PM_{2.5}$ Plan. Thus, the installation of the air curtain and stack at Clairton provide additional assurance that the 2012 $PM_{2.5}$ NAAQS will be attained in the Allegheny County nonattainment area by the attainment date.

Therefore, EPA concludes that the installation of the air curtain and stack at the U.S. Steel Clairton Coke Works are better suited as additional control measures for attainment of the $PM_{2.5}$ NAAQS in the Allegheny County Area. EPA is proposing to approve the installation of the air curtain and stack at the Clairton Coke Works contained in the settlement agreement and order (#19060) referenced in the Allegheny County $PM_{2.5}$ Plan as additional control measures for the attainment of the $PM_{2.5}$ NAAQS in the Allegheny County nonattainment area.

EPA is also proposing to conditionally approve the contingency measures portion of the Allegheny County $PM_{2.5}$ Plan. As discussed previously, ACHD commits to adopt contingency measures and submit, through PADEP, a supplemental SIP revision consisting of a revised contingency measures section of the Allegheny County $PM_{2.5}$ Plan that includes adopted contingency measures from the April 20, 2020 letter and meets the requirements of the $PM_{2.5}$ SIP Requirements Rule and 40 CFR 51.1014. EPA's approval of the contingency measures portion of the Allegheny County $PM_{2.5}$ Plan is contingent on ACHD's adoption of approvable contingency

measures and submittal of a SIP revision that meets the contingency measures requirements of the $PM_{2.5}$ SIP Requirements Rule and 40 CFR 51.1014.

I. Transportation Conformity and MVEBs

1. Requirements for Motor Vehicle Emission Budgets

Section 176(c) of the CAA requires Federal actions in nonattainment and maintenance areas to conform to the SIP's goals of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of the standards. Conformity to the SIP's goals means that such actions will not: 1) cause or contribute to violations of a NAAQS, 2) worsen the severity of an existing violation, or 3) delay timely attainment of any NAAQS or any interim milestone. Section 176(c)(4) of the CAA requires that transportation plans, programs, and projects which are funded or approved under title 23 of the United States Code must be determined to conform with state or Federal air implementation plans. A MVEB is that portion of the total allowable emissions allocated to highway and transit vehicle use that are defined in the implementation plan for a control strategy SIP revision.[76]

Actions involving Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) funding or approval are subject to EPA's transportation conformity rule, codified at 40 CFR part 93, subpart A. Under this rule, the area metropolitan planning organization (MPO) coordinates with state and local air quality and transportation agencies, EPA, FHWA, and FTA to demonstrate that an area's regional transportation plans and transportation improvement programs conform to the applicable SIP.[77] This conformity demonstration is

[76] EPA's Transportation Conformity Rule at 40 CFR 93.101 defines a "control strategy SIP revision" as a "plan which contains specific strategies for controlling the emissions and reducing ambient levels of pollutants in order to satisfy CAA requirements of RFP and attainment."

[77] The Southwestern Pennsylvania Commission (SPC) is the official Metropolitan Planning Organization (MPO) for the 10-county Southwestern Pennsylvania Region, which includes the City of Pittsburgh and surrounding counties –

typically done by showing that estimated emissions from existing and planned highway and transit systems are less than or equal to the MVEB contained in all control strategy SIPs.[78] An attainment, maintenance, or RFP plan SIP should include budgets for the attainment year, each required RFP milestone year, and the last year of the maintenance plan, as appropriate. Budgets are generally established for specific years and specific pollutants or precursors and must reflect all of the motor vehicle control measures contained in the applicable plan.[79] For MVEBs to be approvable, they must meet, at a minimum, EPA's conformity adequacy criteria at 40 CFR 93.118(e)(4).

All $PM_{2.5}$ control strategy SIP MVEBs must include direct $PM_{2.5}$ motor vehicle emissions (including emissions from tailpipes, brake wear, and tire wear).[80] Precursors of $PM_{2.5}$ must also be included in the MVEB, in certain circumstances. NO_x is included in $PM_{2.5}$ nonattainment area MVEBs, unless both EPA Regional Administrator and the director of the state air agency made a finding that transportation-related emissions of NO_x are insignificant to $PM_{2.5}$ nonattainment in the area.[81] Other potential $PM_{2.5}$ precursor emissions, such as VOC, SO_2 and NH_3 are only included in $PM_{2.5}$ area MVEBs if EPA has determined them to be significant in the area.[82]

In order for a pollutant or precursor to be considered an insignificant contributor, the control strategy SIP must demonstrate that it is unreasonable to expect that such an area would experience enough motor vehicle emissions growth in that pollutant/precursor for a NAAQS

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including Allegheny County. SPC is responsible for planning and prioritizing the use of all state and Federal transportation funds allocated to the region.

[78] *See* 40 CFR 93.118(a).

[79] *See* 40 CFR 93.118(e)(4)(v).

[80] Per 40 CFR 93.102(b)(3), direct $PM_{2.5}$ emissions from re-entrained road dust need only be included in the MVEB if EPA Regional Administrator or the director of the state air agency has made a finding that re-entrained road dust emissions within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem or if the applicable SIP includes re-entrained road dust in the budget as part of the RFP, attainment, or maintenance strategy.

[81] *See* 40 CFR 93.102(b)(2)(iv).

[82] *See* 40 CFR 93.102(b)(2)(v).

violation to occur. Insignificance determinations are based on factors such as air quality, SIP motor vehicle control measures, trends and projections of motor vehicle emissions, and the percentage of the total SIP inventory that is comprised of motor vehicle emissions.[83] ACHD did not submit and is not seeking an insignificance determination for NOx.

2. Motor Vehicle Emission Budgets in the Allegheny County $PM_{2.5}$ Attainment Plan

The Commonwealth's September 30, 2019 SIP revision lacks a MVEB specific to the 2012 $PM_{2.5}$ attainment plan for the attainment year of 2021. Instead, the SIP revision refers to existing MVEBs for the 1997 and 2006 $PM_{2.5}$ NAAQS established by EPA's approval of the maintenance plan for the Pittsburgh-Beaver Valley area for the 1997 and 2006 $PM_{2.5}$ NAAQS.[84] This maintenance plan included MVEBs for 2017 and 2025, for the larger Pittsburgh-Beaver Valley area (comprised of part of Allegheny County (excluding the Liberty-Clairton area), Beaver, Butler, Washington, and Westmoreland Counties, as well as portions of Armstrong County, Greene, and Lawrence Counties).

Neither EPA nor the Commonwealth's air director have made transportation-related insignificance findings for NO_x, and EPA has not determined that transportation-related emissions of SO_2, VOC, or NH_3 are significant in Allegheny County. Therefore, there is no established MVEB for SO_2, VOC, and NH_3 in any approved control strategy SIP for the Allegheny County $PM_{2.5}$ area. ACHD has determined VOC and NH_3 to be insignificant as precursors to $PM_{2.5}$ nonattainment as part of the attainment plan.[85] Therefore, transportation conformity requirements are applicable only to $PM_{2.5}$ and NO_x for the Allegheny County Area.

3. EPA's Evaluation and Proposed Action on the Intended MVEB

[83] *See* 40 CFR 93.109(f) for criteria for insignificance determinations. EPA's rationale for allowing insignificance determinations is described in the July 1, 2004 revision to the Transportation Conformity Rule at 69 FR 40004.
[84] *See* 80 FR 59624, October 2, 2015.
[85] *See* Section 5 (Modeling Demonstration) of the September 30, 2019 SIP revision.

EPA is proposing to find that ACHD's plan failed to establish a MVEB for the 2012 $PM_{2.5}$ attainment plan control strategy SIP for the 2021 attainment year, as required for emission budgets by 40 CFR 93.118. A budget is required for each NAAQS for each control strategy SIP, so that conformity can be demonstrated via a "budget" test for that particular area and control strategy milestone.[86]

Because the Allegheny County $PM_{2.5}$ Plan fails to establish an attainment year 2021 MVEB for $PM_{2.5}$ and NO_x, EPA cannot approve this element of the plan at this time. However, PADEP subsequently submitted a letter to EPA dated April 20, 2020, committing to remedy this deficiency by establishing a MVEB in accordance with EPA's Transportation Conformity Rule requirements by September 30, 2020. Because ACHD and the MPO have identified the actual MVEB to be established as part of their April 20, 2020 commitment, EPA is including the MVEB in this action for informational purposes only. The MVEB must still be adopted by Allegheny County through its normal SIP development process, which includes EPA's related requirements to undergo public comment. The April 20, 2020 commitment letter clearly identifies the MVEB that ACHD and the MPO intend to propose for the 2021 attainment year, as shown in Table 16.

Table 16 - Allegheny County, PA 2012 $PM_{2.5}$ NAAQS Attainment Year Intended MVEB for Direct $PM_{2.5}$ and Nitrogen Oxides (NOx)

Motor Vehicle Emissions Budget Year	Direct $PM_{2.5}$ On-Road Emissions (tons per year)	NOx On-Road Emissions (tons per year)
2021	266	5,708

Remedy of this MVEB-related deficiency of the September 30, 2019 SIP revision entails: Identifying the attainment year MVEB in a supplemental SIP revision; conducting a public comment process on the identified MVEB (per the requirements of EPA conformity rule at 40

[86] *See* 40 CFR 93.118(a), (b), and (e).

CFR 93.118(e)); and formally submitting the established MVEB to EPA as a supplemental revision to the attainment plan SIP revision. EPA is proposing to conditionally approve the MVEB element of the SIP submittal until ACHD remedies the deficiency with the 2021 MVEB.

IV. Summary of Proposed Action and Request for Public Comment

Under CAA section 110(k)(3), EPA is proposing to approve Pennsylvania's September 30, 2019 SIP revision to address the CAA's Moderate area planning requirements for the 2012 $PM_{2.5}$ NAAQS in the Allegheny County nonattainment area -- with the exception of the contingency measures and MVEB elements of the plan, which EPA proposes to conditionally approve.

Specifically, EPA is proposing to approve the following elements of the Allegheny County $PM_{2.5}$ Plan:

1) The 2011 base year emissions inventory as meeting the requirements of CAA section 172(c)(3);

2) The RACM/RACT demonstration as meeting the requirements of CAA sections 172(c)(1) and 189(a)(1)(C);

3) The attainment demonstration as meeting the requirements of CAA sections 172(c)(1) and 189(a)(1)(B);

4) The RFP demonstration as meeting the requirements of CAA section 172(c)(2); and

5) The QM demonstration as meeting the requirements of CAA section 189(c).

EPA also proposes to conditionally approve the MVEB and contingency measures elements of the Allegheny County $PM_{2.5}$ Plan. Under section 110(k)(4) of the CAA, EPA may conditionally approve a plan based on a commitment from the Commonwealth to adopt specific enforceable measures within a date certain no more than one year from the date of final

conditional approval. If Pennsylvania fails to meet its commitments by the commitment date, the approval is treated as a disapproval.

Specifically, EPA is proposing to conditionally approve the following elements of the Allegheny County $PM_{2.5}$ Plan:

1) The attainment year 2021 MVEB, as the plan failed to identify the MVEB, as required by CAA section 176(c) and 40 CFR part 93, subpart A. However, Pennsylvania submitted a commitment letter to EPA on April 20, 2020 transmitting ACHD's April 7, 2020 letter that identifies their proposed MVEB for 2021 and commits to finalize a 2021 budget (following public notice and comment) and to submit it to EPA by September 30, 2020 as a revision to this SIP submission and;

2) The contingency measures in Section 8 (Contingency Measures) of the Allegheny County $PM_{2.5}$ Plan, as the submitted contingency measures do not satisfy the requirements of the CAA section 172(c)(9) or the $PM_{2.5}$ SIP Requirements Rule at 40 CFR 51.1014. Upon receipt of that subsequent SIP submission, EPA will take separate action to determine whether those adopted contingency measures satisfy relevant EPA requirements for contingency measures.

EPA is soliciting public comments on the issues discussed in this document. The deadline and instructions for submission of comments are provided in the DATES and ADDRESSES sections of this action. EPA will consider any received comments prior to finalizing this proposed action.

V. Statutory and Executive Order Reviews

Under the CAA, the Administrator is required to approve a SIP submission that complies with the provisions of the CAA and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided

that they meet the criteria of the CAA.

Accordingly, this action merely approves state law as meeting Federal requirements and does not impose additional requirements beyond those imposed by state law. For that reason, this proposed action:

- Is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Orders 12866 (58 FR 51735, October 4, 1993) and 13563 (76 FR 3821, January 21, 2011);
- Is not an Executive Order 13771 (82 FR 9339, February 2, 2017) regulatory action because SIP approvals are exempted under Executive Order 12866.
- Does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- Is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*);
- Does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- Does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- Is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- Is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);

- Is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and
- Does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this proposed rule proposing to approve the Allegheny County $PM_{2.5}$ Plan (with the exception of the contingency measures and MVEB elements, which EPA is proposing to conditionally approve) does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the Commonwealth, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides, Volatile organic compounds.

Dated: 06/04/2020

Cosmo Servidio,
Regional Administrator,
Region III.

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