west virginia department of environmental protection

REDESIGNATION REQUESTS AND MAINTENANCE PLANS FOR THE CHARLESTON, WV NONATTAINMENT AREA, WITH RESPECT TO THE 1997 AND 2006 $PM_{2.5}$ NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

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REDESIGNATION REQUESTS AND MAINTENANCE PLANS FOR THE CHARLESTON, WV NONATTAINMENT AREA, WITH RESPECT TO THE 1997 AND 2006 $PM_{2.5}$ NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

I. INTRODUCTION

The Charleston, WV $PM_{2.5}$ nonattainment area (Charleston area) is a single-state nonattainment area, comprising Kanawha and Putnam Counties in West Virginia. The area has subsequently monitored attainment of the both the 2006 (24-hour standard) and the 1997 (annual) $PM_{2.5}$ standards. The latter is met when the pollutant concentration is at or below 15 $\mu g/m^3$ (the 3 year average of the 4th highest daily maximums). The Charleston area had an annual design value for 2007-2009 of 14.4 $\mu g/m^3$, 2008-2010 of 13.2 $\mu g/m^3$ and 2009-2011 of 12.5 $\mu g/m^3$. The area also monitored attainment of the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ with a design value for 2007-2009 of 32 $\mu g/m^3$, 2008-2010 of 28 $\mu g/m^3$, and 2009-2011 of $\mu g/m^3$. The State of West Virginia herein requests redesignation by the United States Environmental Protection Agency (EPA) of Kanawha and Putnam Counties to attainment relative to both the 1997 and 2006 $PM_{2.5}$ National Ambient Air Quality Standards.

A. Requests

The State of West Virginia is requesting that the EPA redesignate the Charleston, WV 1997 $PM_{2.5}$ Nonattainment Area to attainment pursuant to the provisions of the Clean Air Act, section 107. The State is also requesting that EPA concurrently approve the associated maintenance plan as a revision to the State Implementation Plan (SIP), meeting the requirements of Clean Air Act, section 175A, which demonstrates that the area will continue to meet the 1997 $PM_{2.5}$ air quality standards for at least ten more years.

Additionally, the State of West Virginia is requesting that the EPA redesignate the Charleston, WV 2006 $PM_{2.5}$ Nonattainment Area to attainment pursuant to the provisions of the Clean Air Act, section 107. The State is also requesting that EPA concurrently approve the associated maintenance plan as a revision to the State Implementation Plan (SIP), meeting the requirements of Clean Air Act, section 175A, which demonstrates that the area will continue to meet the current $PM_{2.5}$ air quality standards for at least ten more years.

If EPA finds any substantive deficiency with respect to one of West Virginia's requests for redesignation (and/or the associated maintenance plan) but not the other (e.g. EPA determines the 1997 request/maintenance plan is adequate but the 2006 request is not, or vice versa), then the State requests that EPA regard the redesignation requests as severable and continue processing the one found adequate.

B. Background

The EPA revised the NAAQS for particulate matter in July 1997. It replaced the existing PM_{10} standard with a health based $PM_{2.5}$ standard and retained the PM_{10} standard as a "coarse" standard protecting welfare. The 1997 $PM_{2.5}$ standards include an annual standard set at 15.0 micrograms per

cubic meter ($\mu g/m^3$), based on the 3-year average of annual mean $PM_{2.5}$ concentrations and a 24-hour standard of 65 $\mu g/m^3$, based on the 3-year average of the 98th percentile of 24-hour concentrations.

The revised NAAQS were legally challenged in the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit). On May 14, 1999, the D.C. Circuit remanded, without vacatur, the standard back to EPA. The remand did not question the level at which EPA set the standards but rather the constitutionality of the CAA provision that authorizes EPA to set national air quality standards. EPA requested a rehearing which the D.C. Circuit denied. Therefore, in December 1999, EPA appealed the D.C. Circuit decision to the U.S. Supreme Court. The U.S. Supreme Court issued a decision on February 27, 2001 that unanimously affirmed the constitutionality of the CAA provision but did remand several other issues back to the D.C. Circuit, including the issue of whether EPA acted arbitrarily and capriciously in establishing the specific levels of the standards.

The D.C. Circuit heard arguments in this remanded case in December 2001, and issued its decision on March 26, 2002. The D.C. Circuit rejected the claims that the EPA had acted arbitrarily and capriciously in setting the levels of the standards.

On December 17, 2004, EPA promulgated the initial $PM_{2.5}$ nonattainment areas designations for the $PM_{2.5}$ standards across the country. Modifications to those designations were made and an effective date was set at April 5, 2005. Unlike Subpart 2 of the CAA Amendments of 1990 which defined five ozone nonattainment classifications for the areas that exceed the NAAQS based on the severity of the ozone levels, $PM_{2.5}$ nonattainment designations are simply labeled "nonattainment." The CAA Amendments require states with $PM_{2.5}$ nonattainment areas to submit a plan within three years of the effective date of the designations (April 5, 2008) detailing how the $PM_{2.5}$ standards would be attained by April 5, 2010.

As a result of the $PM_{2.5}$ designations West Virginia DEP was required to develop a plan to reduce oxides of nitrogen (NO_x), sulfur dioxide (SO_2) and direct $PM_{2.5}$ emissions and to demonstrate that the area would meet the federal annual air quality standard by April 5, 2010. West Virginia's main $PM_{2.5}$ components are primary particles (organic carbon, crustal material, and elemental carbon), SO_2 and NO_x, which were included in the attainment demonstration analysis. Volatile organic compounds (VOCs) and ammonia (NH_3) were not included in the analysis since they were not part of West Virginia's current attainment strategy for $PM_{2.5}$ (although controls for VOCs have been implemented for ozone nonattainment). This is consistent with EPA's "Clean Air Particle Implementation Rule" [74FR 20856] (hereafter referred to as "Implementation Rule"). In the Implementation Rule EPA presumes NH_3 emissions are not a $PM_{2.5}$ attainment plan precursor and that States are not required to address VOC unless the State or EPA makes a technical demonstration that emissions of VOCs significantly contribute to nonattainment.

On November 4, 2009, West Virginia DEP submitted the *West Virginia 1997 Fine Particle (PM2.5) Attainment Demonstration and State Implementation Plan for the Charleston, West Virginia Nonattainment Area, Comprising Kanawha and Putnam Counties* as a proposed revision to the State Implementation Plan to meet its obligations under the Clean Air Act and the Implementation Rule.

On October 11, 2011 [76 FR 62640] EPA determined that the Charleston, WV area had attained the 1997 $PM_{2.5}$ NAAQS (Clean Data Determination). This determination was based on complete, quality-

assured and certified ambient air monitoring data for the three year period 2007-2009. EPA also determined, in accordance with EPA's $PM_{2.5}$ Implementation Rule of April 25, 2007 [72 FR 20664], that the area had attained the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date of April 5, 2010. This determination suspends the state's requirement to submit an attainment demonstration, Reasonably Available Control Measures (RACM), including Reasonably Available Control Technology (RACT), Reasonable Further Progress (RFP) plan, contingency measures, and other planning SIP revisions related to attainment of the 1997 $PM_{2.5}$ NAAQS for so long as the area continues to attain the 1997 $PM_{2.5}$ NAAQS.

This document is intended to support West Virginia's request that the Charleston area be redesignated from nonattainment to attainment for both the 1997 and 2006 $PM_{2.5}$ standards. As a matter of convenience, we may occasionally refer to the former as the "annual " standard (since the 15 ug annual average level is common to both standards) while we may refer to the latter as the "24-hour standard" (since it is the more stringent of the two short term standards.)

On October 17, 2006, based on its review of the air quality criteria and NAAQS for $PM_{2.5}$, EPA revised the primary and secondary NAAQS to provide increased protection of public health and welfare. With regard to the primary standards for $PM_{2.5}$ EPA revised the level of the 24-hour standard to 35 $\mu g/m^3$ and retained the level of the annual standard at 15 $\mu g/m^3$. With regard to the secondary standard, EPA revised the existing 24-hour $PM_{2.5}$ standard by making it identical to the revised 24-hour primary standard, retaining the annual $PM_{2.5}$ and 24-hour PM_{10} secondary standards, and revoking the annual PM_{10} secondary standard.

On November 13, 2009, EPA promulgated the initial $PM_{2.5}$ nonattainment areas designations for the $PM_{2.5}$ standards across the country for the 2006 24-hour $PM_{2.5}$ NAAQS, with an effective date of December 14, 2009 [74 FR 58688]. The basis for establishing these areas as nonattainment was monitored air quality for 2006-2008 indicating a violation of the NAAQS. The CAA Amendments require states with $PM_{2.5}$ nonattainment areas to submit a plan within three years of the effective date of the designations (December 14, 2009) detailing how the $PM_{2.5}$ standards would be attained by December 14, 2012.

Two areas in West Virginia were included in the initial $PM_{2.5}$ nonattainment area designations:

- Charleston, WV – Kanawha and Putnam Counties – with a 2006 - 2008 design value of 36 $\mu g/m^3$;
- and Steubenville-Weirton, OH-WV – Brooke and Hancock Counties in West Virginia and Jefferson County in Ohio – with a 2006 - 2008 design value of 41 $\mu g/m^3$.

The Clean Air Act (CAA) requires areas failing to meet a National Ambient Air Quality Standard (NAAQS) to develop State Implementation Plans (SIPs) to expeditiously attain and maintain the standard. However, areas that attain before the required date may be exempt from certain otherwise applicable requirements.

On February 14, 2011, West Virginia requested that EPA make a formal finding, based on 2008-2010 data, that the two areas are attaining the 2006 $PM_{2.5}$ NAAQS.

On November 18, 2011 [76 FR 71450], EPA determined that the Charleston, WV nonattainment area had clean data for the 2006 $PM_{2.5}$ NAAQS. The determination was based upon quality assured, quality controlled, and certified ambient air monitoring data showing that the area has monitored attainment of the 24-hour 2006 $PM_{2.5}$ NAAQS based on the 2007-2009 data and data available to date for 2010 in EPA's Air Quality System (AQS) database. EPA's determination releases the Charleston area from the requirements to submit an attainment demonstration, associated reasonably available control measures, a reasonable further progress plan, contingency measures, and other planning State Implementation Plans (SIPs) related to attainment of the standard for so long as the Area continues to meet the 24-hour 2006 $PM_{2.5}$ NAAQS.

On March 2, 2012, Stephen Page, Director of EPA's Office of Air Quality Planning and Standards (OAQPS) issued Implementation Guidance for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS). This memorandum provides guidance regarding the development of state implementation plans (SIPs) to demonstrate attainment with the 2006 24-hour $PM_{2.5}$ NAAQS.

C. Geographic Description

The Charleston, WV $PM_{2.5}$ nonattainment area (Charleston area) is a single-state nonattainment area, comprising Kanawha and Putnam Counties in West Virginia. This area is shown in Figure 1 under Section II.A.

II. REDESIGNATION CRITERIA

Pursuant to Section 107(d)(3)(E) of the CAA states must sufficiently address five issues to obtain redesignation of a nonattainment area to attainment:

A. determinate that the area has attained the applicable NAAQS;
B. have a fully approved implementation plan under CAA section 110(k);
C. show that the improvement in air quality is due to permanent and enforceable emission reductions;
D. submit an EPA approvable maintenance plan which ensures attainment of the NAAQS for at least ten years beyond redesignation; and
E. show that the area has met the applicable requirements of CAA section 110 and part D.

The State of West Virginia herein affirmatively completes all five of the required elements as detailed below.

A. The Charleston Area has attained the 1997 and 2006 $PM_{2.5}$ Standards

[See Appedix A]

The following information is taken from EPA's *Guideline on Data Handling Conventions for the PM NAAQS*, U.S. EPA-454/R-99-008, April 1999.

In accordance with the CAA Amendments, three complete years of monitoring data are required to demonstrate attainment at a monitoring site.

The 24-hour $PM_{2.5}$ primary and secondary ambient air quality standards are met when the three-year average of the 98th percentile values for $PM_{2.5}$ at each monitoring site is less than or equal to 35 $\mu g/m^3$. While calculating design values for 24-hour average $PM_{2.5}$ concentrations one decimal place must be carried in the computations, with final results rounded to the nearest 1 $\mu g/m^3$. Decimals 0.5 or greater are rounded up, and those less than 0.5 are rounded down, so that 35.49 $\mu g/m^3$ is the largest concentration that is less than or equal to 35 $\mu g/m^3$. Values at or below 35 $\mu g/m^3$ meet the standard; values greater than 35 $\mu g/m^3$ exceed the standard. An individual site's 3-year average of the 98th percentile values is also called the site's design value. The air quality design value for the area is the highest design value among all sites in the area.

The annual $PM_{2.5}$ primary and secondary ambient air quality standards are met at an ambient air quality monitoring site when the three-year average of the annual average is less than 15.0 $\mu g/m^3$. While calculating design values, three significant digits must be carried in the computations, with final values rounded to the nearest 0.1 $\mu g/m^3$. Decimals 0.05 or greater are rounded up, and those less than 0.05 are rounded down, so that 15.049 $\mu g/m^3$ is the largest concentration that is less than, or equal to 15.0 $\mu g/m^3$. Values at or below 15.0 $\mu g/m^3$ meet the standard; values equal to or greater than 15.1 $\mu g/m^3$ exceed the standard. An area is in compliance with the annual $PM_{2.5}$ NAAQS only if every monitoring site in the area meets the NAAQS. An individual site's 3-year average of the annual average concentrations is also called the site's design value. The air quality design value for the area is the highest design value among all sites in the area.

Currently there are two (2) monitors measuring $PM_{2.5}$ concentrations in the Charleston, WV nonattainment area. These monitors are located in Kanawha County and operated by the West Virginia Division of Air Quality (DAQ). The location of the monitoring sites for this nonattainment area are shown in Figure 1. A listing of the design values based on the three-year average of the annual mean concentrations from 2001-2003 through 2009-2011. The data for the monitors is also located in Appendix A.

The data in Appendix A has been quality assured, up through 2011 in accordance with 40 CFR 58.10 and all other federal requirements. The data has been recorded in the AQS database and, therefore, the data are available to the public. Table1 shows the monitoring data for 2001-2011 that were retrieved from the EPA AQS.

Figure 1: Map of the Charleston, WV nonattainment area and monitor locations

Table 1: Charleston Nonattainment Area Design Values for the 2006 and 1997 Annual and 24-hr $PM_{2.5}$ NAAQS

	1997 NAAQS 24 hr 3 yr 98% = 65 µg/m³, 2006 NAAQS 24 hr 3 yr 98% = 35 µg/m³									1997 and 2006 Annual NAAQS = 15 µg/m³								
FRM Site	**01-03**	**02-04**	**03-05**	**04-06**	**05-07**	**06-08**	**07-09**	**08-10**	**09-11**	**01-03**	**02-04**	**03-05**	**04-06**	**05-07**	**06-08**	**07-09**	**08-10**	**09-11**
54-039-0010	37	34	34	35	36	34	29	25	24	15.5	14.8	15.1	15.0	15.4	14.2	13.1	11.8	11.0
54-039-0011	--	--	--	33	31	--	--	--	--	--	--	--	13.2	12.2	--	--	--	--
54-039-1005	40	36	36	37	38	36	32	28	26	17.1	16.4	16.6	16.4	16.6	15.4	14.4	13.2	12.5

Source: EPA Air Quality System (AQS); http://www.epa.gov/ttn/airs/airsaqs/index.htm
Notes: Green shading indicates meeting the most stringent standard, all monitors in the area monitor attainment.

The design values calculated for the Charleston area demonstrate that the 2006 and 1997 $PM_{2.5}$ NAAQS have been attained. The area's design values have trended downward as emissions have declined due to such factors as cleaner automobiles and fuels, and controls for EGUs, at the national, regional and local level.

National monitoring for $PM_{2.5}$ began in 1999. There has been a clear downward trend in design values for all monitors in West Virginia, as shown in Figure 2. Design values have also trended downward nationally, as shown in Figure 3.

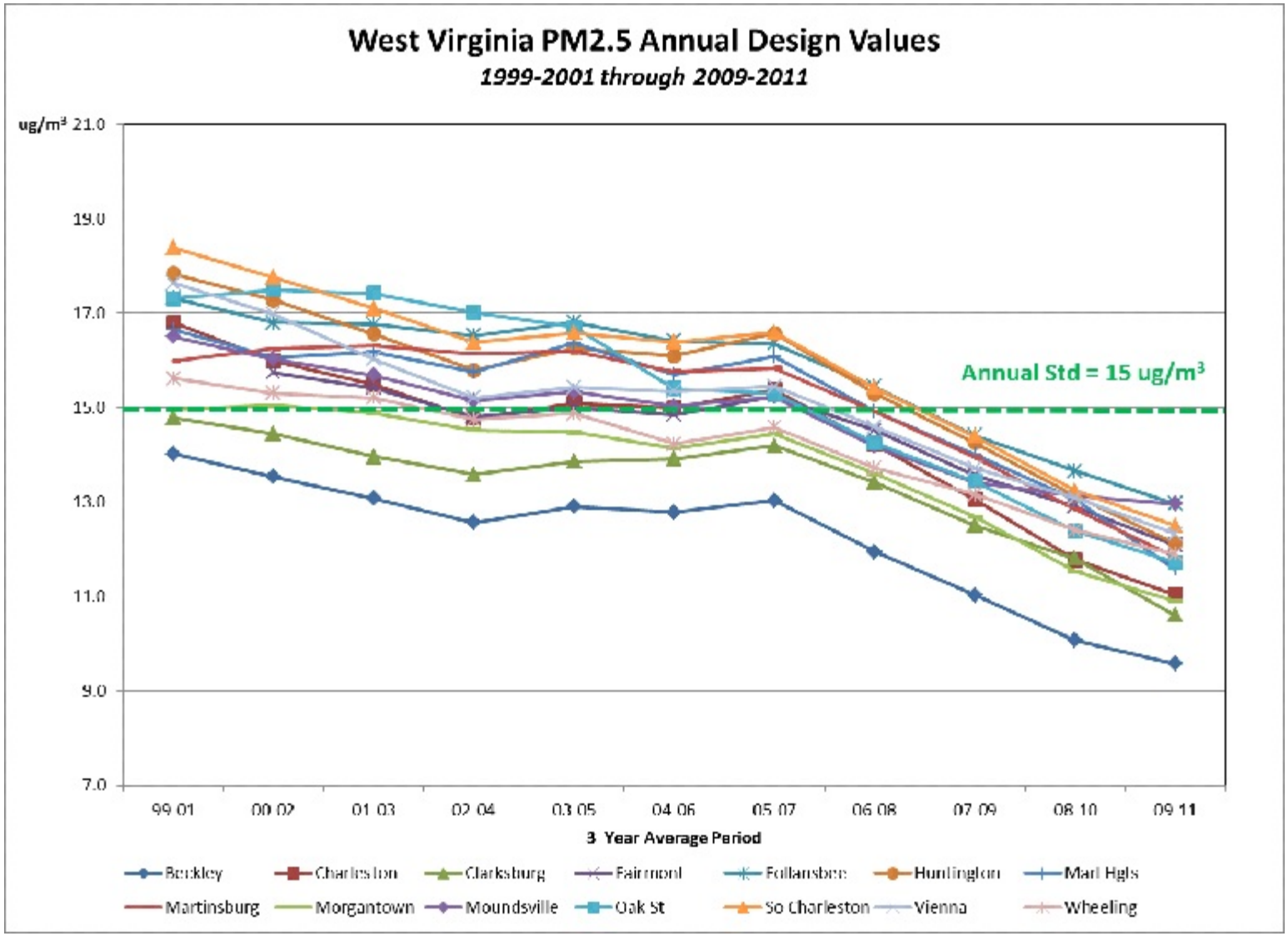
On October 11, 2011[76 FR 62640] EPA determined that the Charleston, WV area had attained the 1997 $PM_{2.5}$ NAAQS [Clean Data Determination]. This determination was based upon complete, quality assured, quality controlled, and certified ambient air monitoring data that showed that the area monitored attainment of the 1997 $PM_{2.5}$ NAAQS during the 2007-2009 monitoring period. EPA also determined that the Charleston, WV area had attained the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date of April 5, 2010.

On November 18, 2011 [76 FR 71450], EPA determined that the Charleston, WV nonattainment area has clean data for the 2006 $PM_{2.5}$ NAAQS. The determination was based upon quality assured, quality controlled, and certified ambient air monitoring data showing that the area has monitored attainment of the 24-hour 2006 $PM_{2.5}$ NAAQS based on the 2007-2009 data and data available to date for 2010 in EPA's Air Quality System (AQS) database.

Ambient air quality monitoring data for 2008-2010, and for 2009- 2011, demonstrate that the air quality continues to meet both the 24-hour and annual NAAQS for $PM_{2.5}$ in this nonattainment area. The NAAQS attainment, accompanied by decreases in emission levels discussed in Chapter Four, support a redesignation to attainment for the Charleston area based on the requirements in Section 107(d)(3)(E) of the CAA.

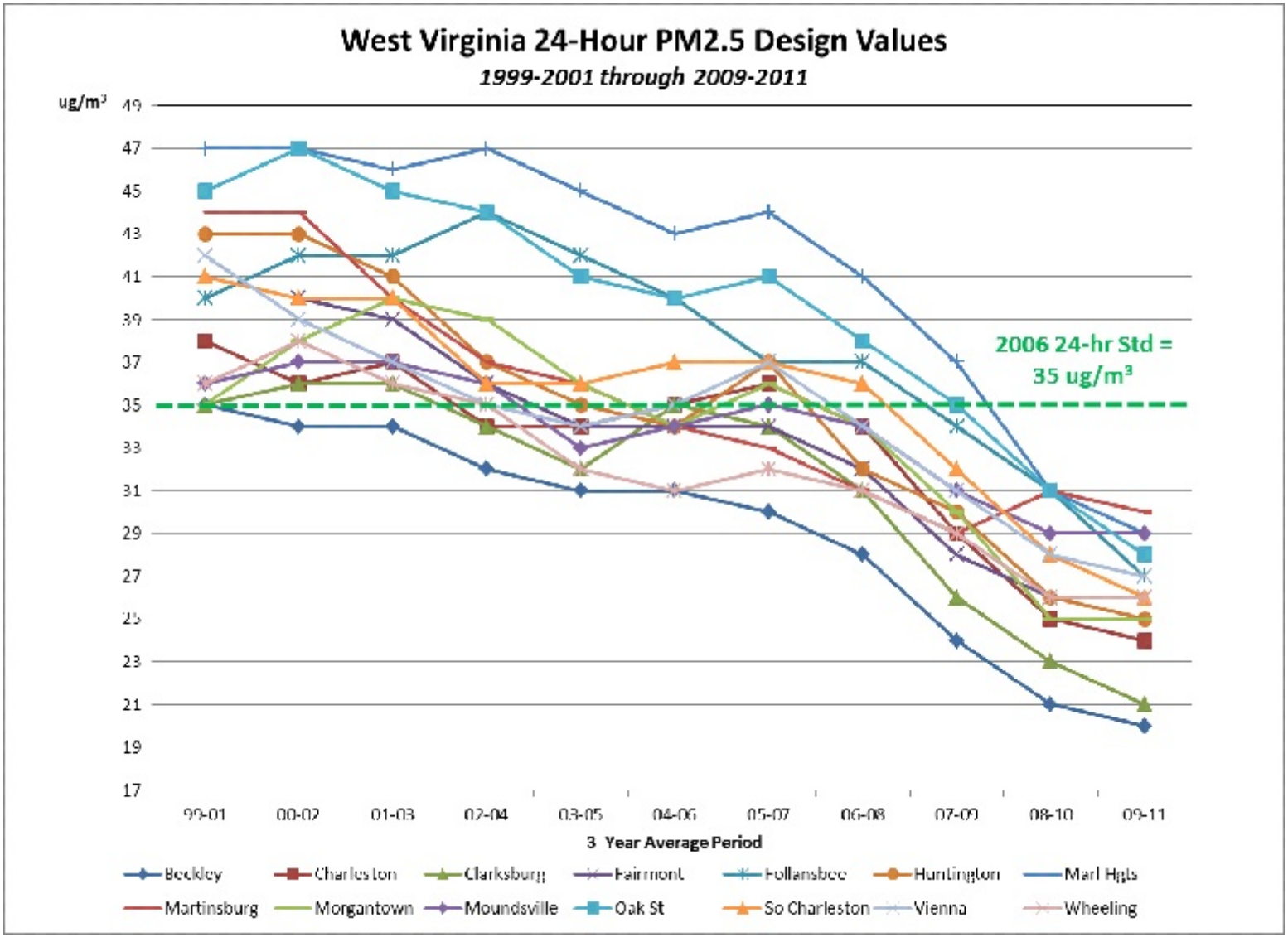
DAQ commits to continue monitoring $PM_{2.5}$ levels at the West Virginia sites indicated in Figure 1 and Table 1. DAQ will consult with EPA Region III prior to making changes to the existing monitoring network, should changes become necessary in the future. DAQ will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58 and all other federal requirements. Connection to a central station and updates to the DAQ web site will provide real time availability of the data and knowledge of any exceedances. DAQ will enter all data into AQS on a timely basis in accordance with federal guidelines.

Figure 2: West Virginia $PM_{2.5}$ Annual Design Values, 1999-2001 through 2008-2010.



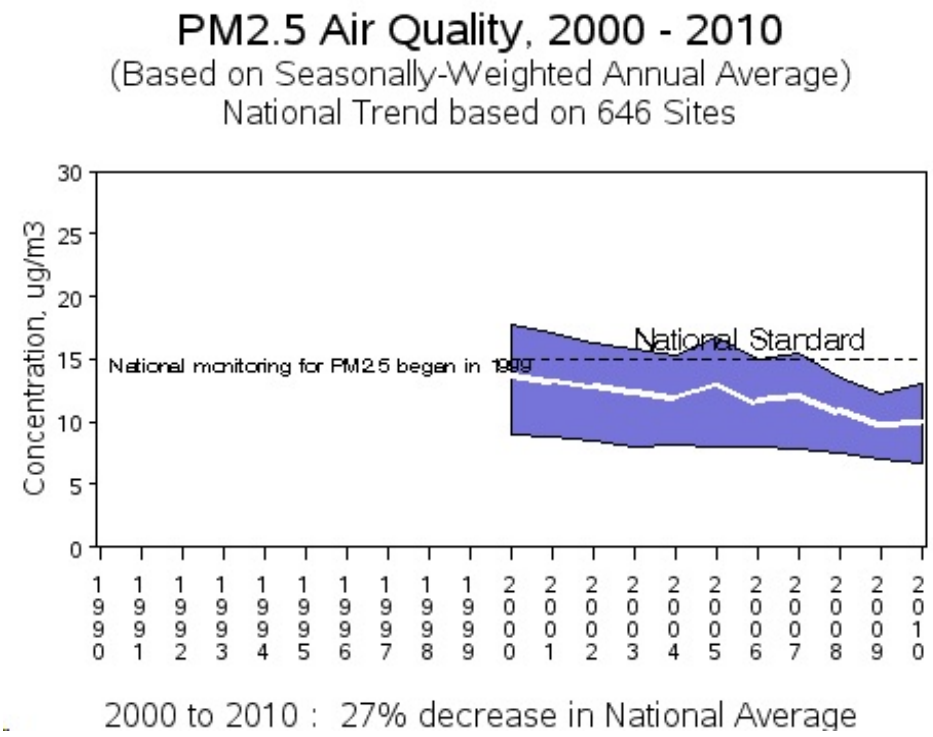
Data Source: http://www.epa.gov/airtrends/values.html, from Excel spreadsheet: PM25dv20082010Final.xls

Figure 3: West Virginia $PM_{2.5}$ 24-Hour Design Values, 1999-2001 through 2008-2010



Data Source: http://www.epa.gov/airtrends/values.html, from Excel spreadsheet: PM25dv20082010Final.xls

Figure 4: $PM_{2.5}$ Annual Mean National Trends



Source: http://www.epa.gov/airtrends/pm.html

B. The Charleston Area has a Fully Approved SIP Under Section 110(k) of the CAA

On November 13, 2009, EPA promulgated the initial $PM_{2.5}$ nonattainment area designations for the 2006 $PM_{2.5}$ standards across the country, including the Charleston area. An effective date was set at December 14, 2009. The CAA Amendments require states with $PM_{2.5}$ nonattainment areas to submit a plan within three years of the effective date of the designations (December 14, 2009) detailing how the $PM_{2.5}$ standards would be attained, by December 14, 2012.

On November 18, 2011 [76 FR 71450] EPA determined that the Charleston area had attained the 2006 24-hour $PM_{2.5}$ NAAQS [Clean Data Determination]. This determination was based upon complete, quality assured, quality controlled, and certified ambient air monitoring data that showed that the area monitored attainment of the 2006 24-hour $PM_{2.5}$ NAAQS during the 2007-2009 monitoring period and data available to date for 2010 in EPA's AQS database. This Clean Data Determination releases the Charleston area from the requirements to submit an attainment demonstration, associated reasonably available control measures, a reasonable further progress plan, contingency measures, and other planning SIPs related to attainment of the standard for as long as the area continues to meet the 2006 $PM_{2.5}$ NAAQS.

On December 17, 2004, EPA promulgated the initial $PM_{2.5}$ nonattainment areas designations for the $PM_{2.5}$ standards across the country, including the Charleston, WV area. Modifications to those designations were made and an effective date was set at April 5, 2005. Unlike Subpart 2 of the CAA Amendments of 1990 which defined five ozone nonattainment classifications for the areas that exceed

the NAAQS based on the severity of the ozone levels, $PM_{2.5}$ nonattainment designations are simply labeled "nonattainment." The CAA Amendments require states with $PM_{2.5}$ nonattainment areas to submit a plan within three years of the effective date of the designations (April 5, 2008) detailing how the $PM_{2.5}$ standards would be attained by April 5, 2010. The DEP submitted a revision to the SIP for the State of West Virginia to meet its obligations under the CAA and the Federal Clean Air Implementation Rule for the Charleston area on November 4, 2009. The submittal expressly addressed the pertinent requirements of the CAA, Part D and the associated requirements of the Fine Particle Implementation Rule beginning at 40 CFR 51.1000. EPA notified the DEP that the SIP submittal was technically and administratively complete by letter dated November 10, 2009. Furthermore, on October 11, 2011, in accordance with Section 179(c)(1) of the CAA, EPA determined that the Charleston $PM_{2.5}$ nonattainment area had attained the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date of April 5, 2010 [76 FR 62640]. This Clean Data Determination suspended the requirement for the state to submit an attainment demonstration, associated reasonably available control measures, a reasonable further progress plan, contingency measures, and other planning SIPs related to attainment of the standard for as long as the area continues to meet the 1997 $PM_{2.5}$ NAAQS. The DEP believes that all applicable requirements under CAA section 110(k) have been met.

C. The Charleston Area's Air Quality Improvement is Due to Permanent and Enforceable Emissions Reductions

Several federally enforceable control measures have been implemented during the past decade which contribute to the air quality improvement, and will continue to reduce emissions in the future. These are discussed in detail in Section V - Control Measures and Regulations.

D. The State has Developed a Maintenance Plan for the Charleston Area Which Ensures Attainment of the 1997 and 2006 $PM_{2.5}$ Standards for at least 10 Years

Section 107(d)(3)(E) of the CAAA stipulates that for an area to be redesignated to attainment EPA must approve a maintenance plan that meets the requirements of Section 175A. A state may submit both the redesignation request and maintenance plan at the same time, and the plan adoption process, including rule-making or public hearing proceedings, may proceed on a parallel track. West Virginia is herein submitting a request to redesignate the Charleston area to attainment and is also requesting that EPA concurrently process this request and approve the accompanying maintenance plan as a revision to the SIP.

E. The Charleston Area Has Met All Relevant Requirements under CAA Section 110 and Part D

For purposes of redesignation, a state must meet all requirements of Section 110 and Part D that were applicable prior to submittal of the complete redesignation request.

The March 2, 2012 *Implementation Guidance for the 2006 24-Hour Fine Particle (PM2.5) National Ambient Air Quality Standards (NAAQS)* states:

> In April 2007, the U. S. Environmental Protection Agency issued a detailed implementation rule to assist states with the development of SIPs to demonstrate

attainment with the annual and 24-hour 1997 $PM_{2.5}$ NAAQS (the "2007 $PM_{2.5}$ Implementation Rule"). We believe that the overall framework and policy of the 2007 $PM_{2.5}$ Implementation Rule continues to provide effective and appropriate guidance on the EPA's interpretation of the general statutory requirements that states should address in their SIPs. In general, the EPA believes that the interpretations of the statute in the framework of the 2007 $PM_{2.5}$ Implementation Rule are relevant to the statutory requirements for the 2006 24-hour $PM_{2.5}$ NAAQS, for which SIPs are due by December 14, 2012. . . .

Subpart 1 of Part D consists of general requirements applicable to all areas which are designated nonattainment based on a violation of the NAAQS. Subpart 4 of Part D consists of more specific requirements applicable to particulate matter (specifically to address PM_{10}). However, for the purpose of implementing the 1997 $PM_{2.5}$ standard, EPA's Implementation Rule stated Subpart 1, rather than Subpart 4, is appropriate for the purpose of implementing $PM_{2.5}$.[72 FR 20589]

1. Section 110(a) requirements

Section 110(a) of Title I of the CAA contains the general requirements for a SIP. Section 110(a)(2) provides that the implementation plan submitted by a state must have been adopted by the state after reasonable public notice and hearing, and that, among other things, it must include enforceable emission limitations and other control measures, means or techniques necessary to meet the requirements of the CAA; provide for establishment and operation of appropriate devices, methods, systems and procedures necessary to monitor ambient air quality; provide for implementation of a source permit program to regulate the modification and construction of any stationary source within the areas covered by the plan; include provisions for the implementation of Part C, prevention of significant deterioration (PSD) and Part D, NSR permit programs; include criteria for stationary source emission control measures, monitoring, and reporting; include provisions for air quality modeling; and provides for public and local agency participation in planning and emission control rule development. In West Virginia's December 11, 2007, and October 1, 2009 infrastructure SIP submissions and March 18, 2010 certification, West Virginia verified that the State fulfills the requirements of Section 110(a)(2) of the Act.

Section 110(a)(2)(D) also requires State plans to prohibit emissions from within the State which contribute significantly to nonattainment or maintenance areas in any other State, or which interfere with programs under Part C to prevent significant deterioration of air quality or to achieve reasonable progress toward the national visibility goal for Federal class I areas (national parks and wilderness areas). In order to assist States in addressing their obligations regarding regionally transported pollution, EPA finalized CAIR to reduce SO_2 and NO_x emissions from large electric generating units (EGU). West Virginia has met the requirements of the federal CAIR to reduce NO_x and SO_2 emissions contributing to downwind states. On August 4, 2009, EPA approved West Virginia's CAIR program [74 FR 38536] , which were found in West Virginia's Code of State Rules at 45 CSR39, 45CSR40, and 45CSR41. On July 6, 2010, EPA proposed a replacement to the CAIR program, the Transport Rule [75 FR 45210]. The Transport Rule, or the Cross-State Air Pollution Rule (CSAPR) as it is now called, was finalized on July 6, 2011, and published in the Federal Register on August 8, 2011 [76 FR 48208]. Under the CSAPR, EPA adopted Federal Implementation Plans (FIPs) for each state covered by the rule, including West Virginia. The CSAPR further assists states in addressing their obligations regarding regionally transported pollution by providing reductions in NO_x and SO_2 emissions in 2012 and 2014. On

December 30, 2011 the United States Court of Appeals for the District of Columbia stayed the implementation of CSAPR, indefinitely reinstating CAIR. On August 21, 2012, the United States Court of Appeals for the District of Columbia vacated CSAPR, indefinitely reinstating CAIR.

2. Section 172(c) requirements

Section 172(c) contains general requirements for nonattainment plans. The requirements for reasonable further progress, identification of certain emissions increases, and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard. The requirements for an emission inventory will be satisfied by the inventory requirements of the maintenance plan. Sections III and V discuss these requirements in more detail.

3. Conformity

The state must work with EPA to show that its SIP provisions are consistent with the Section 176(c)(4) conformity requirements. The redesignation request should include conformity procedures, if the state already has these procedures in place. If a state does not have conformity procedures in place at the time that it submits a redesignation request, the state must commit to follow EPA's conformity regulation upon issuance, as applicable. Section IV discusses this requirement in more detail.

III. MAINTENANCE PLAN
(CAA Section 107(d)(3)(E)(iv))

Section 107(d)(3)(E) stipulates that for an area to be redesignated, EPA must fully approve a maintenance plan that meets the requirements of Section 175(A). The maintenance plan will constitute a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation. Section 175 (A) further states that the plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.

In addition, the maintenance plan shall contain such contingency measures as the Administrator deems necessary to ensure prompt correction of any violation of the NAAQS. At a minimum, the contingency measures must include a requirement that the state will implement all measures contained in the nonattainment SIP prior to redesignation.

The March 2, 2012, *Implementation Guidance for the 2006 24-hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)* memo from Stephen Page, Director of OAQPS, states:

> As mentioned earlier in this memorandum, statewide annual emission inventories are required under 40 CFR Part 51, Subpart A. We expect that for many nonattainment areas, these annual inventories will serve as an appropriate starting point for the emission inventories used for SIP development. In contrast with the 1997 annual $PM_{2.5}$ NAAQS, where states rely only on annual inventories in the implementation process, the 2006 24-hour $PM_{2.5}$ NAAQS is designed to protect against peak exposures. Thus, for the 2006 24-hour $PM_{2.5}$ NAAQS, there are some circumstances in which EPA believes that seasonal inventories may be useful for SIP Planning purposes. For example, we have observed that in some nonattainment areas, all of the highest fine particle concentrations over the course of a year occur in one season.
>
> If exceedances occur during only one season for each of the years on which the nonattainment designation is based, and this is the case for all subsequent years, we recommend that states develop a seasonal inventory and that they use this inventory for SIP planning purposes. . . .

West Virginia DAQ analyzed the $PM_{2.5}$ monitoring data for the Charleston area to determine whether the exceedances occurred in only one season. As can be seen in Figure 5 below, exceedances between 2006 and 2008, the years on which the nonattainment designation is based, occurred in the first, second, and third quarters. During subsequent years, 2009 through 2011, one exceedance occurred in the third quarter. Based on this analysis and in consultation with EPA, it was determined that an annual inventory would be sufficient for SIP planning, and that a seasonal inventory would not be required.

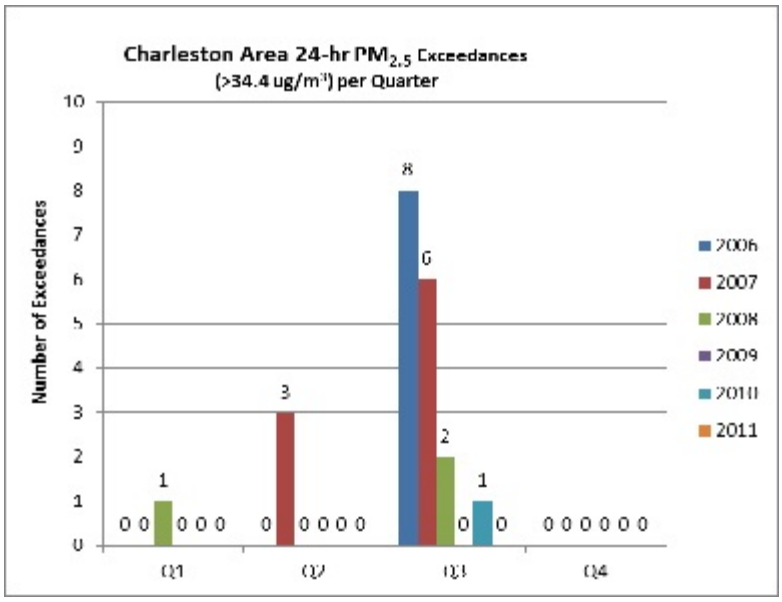


Figure 5: Analysis of Exceedances by Quarter

In consultation with EPA, DAQ selected the year 2025 as the end year of the maintenance plan for this redesignation request. This document contains projected emissions inventories for 2018 and 2025. Thus, the pertinent inventory years are: 2005 (nonattainment year), 2008 (attainment year and maintenance plan base year), 2018 (interim year) and 2025 (maintenance plan end year). Three specific emissions inventory demonstrations should be made:

1. The attainment year (2008) emissions of $PM_{2.5}$, NO_x and SO_2 must each be less than the corresponding emissions in the nonattainment year (2005). The reductions must be attributable to federally enforceable emission reductions (as discussed in Section III.E and Section V).

2. The interim year (2018) emissions of each of the three pollutants should be less than the maintenance plan base year (2008).

3. The end year (2025) emissions of each of the three pollutants should be less than the maintenance plan base year (2008).

As can be seen in Table 2 below, West Virginia has seen a significant state-wide decline of the 467,081 tons of SO_2 and 159,481 tons of NO_x emitted by EGUs in 2005. In 2008 and 2009 facilities began preparing for and implementing control programs to address CAIR and consent orders. Significant reductions occurred regionally and nationally. Data available for 2010, show the SO_2 and NO_x reductions which were implemented under CAIR.

Table 2: Reductions in SO_2 and NO_x EGU Emissions Between 2008 and 2010						
	SO_2			NO_x		
	2008	**2010**	**% Change**	**2008**	**2010**	**% Change**
West Virginia	301,574	106,088	-65%	97,331	51,393	-47%
Ohio	709,444	570,045	-20%	235,018	104,574	-56%
National	7,616,449	5,119743	-33%	2,996,594	2,061,062	-31%

Source: Clean Air Markets, Data and Maps, Quick Reports, State Level Emissions Quick Report and Program Level Emissions Quick Report, Acid Rain Program

Further, Tables 3- 13 clearly show total emissions from all sectors decreased in the period from 2005 to 2008 in the nonattainment area. As outlined below, the reductions are enforceable and should continue in the future.

On May 12, 2005, EPA promulgated the CAIR. Beginning in 2009, EPA's CAIR rule required EGUs in 28 eastern states and the District of Columbia to significantly reduce emissions of NO_x and SO_2. CAIR replaced the NO_x SIP Call for EGUs. The intent of the CAIR program was for national NO_x emissions to be cut from 4.5 million tons in 2004, to a cap of 1.5 million tons by 2009, and 1.3 million tons in 2018 in 28 states. States were required to submit a CAIR SIP as part of this effort. West Virginia DEP submitted a CAIR SIP to EPA on June 1, 2006. Revisions to the CAIR SIP were submitted on April 22, 2008. The revised CAIR SIP was approved on August 4, 2009 (74 FR 38536). As a result of CAIR, EPA projected that in 2009 emissions of NO_x would decrease from a baseline of 179,000 tons per year to 63,000 tons per year while in 2010 emissions of SO_2 would decrease from a baseline of 582,000 tons per year to 250,000 tons per year, within West Virginia. And by 2015 EPA projected emissions of NO_x would decrease to 44,000 tons per year while emissions of SO_2 would decrease to 118,000 tons per year, within West Virginia.

On December 23, 2008, EPA's CAIR program was remanded without vacatur by the D.C. Circuit Court.

The following was reported by EPA's Clean Markets Division:

> Based on emissions monitoring data, EPA has observed substantial reductions in emissions from 2005 to 2010 as companies installed more controls, electric demand declined, and low natural gas prices made combined-cycle gas-fired units more competitive in several parts of the country. Thus, even after CAIR's vacatur and subsequent remand in late 2008, the controls in place generally have continued to operate, helping to drive continued progress in reducing emissions. However, allowance prices of SO_2 have been relatively low since 2008, raising concerns that coal-fired units could burn dirtier fuels, operate scrubbers at reduced efficiency, or even bypass scrubbers altogether, instead relying on banked allowances (because there is not an existing large bank of NO_x allowances, NO_x allowance prices have not been affected as significantly). For these reasons, EPA is tracking SO_2 and NO_x emissions

> closely each quarter to evaluate further progress and assess whether backsliding may be occurring and, if so, where it may be taking place. [http://www.epa.gov/airmarkets/background.htm]

On July 6, 2010, EPA proposed a replacement to the CAIR program, the Transport Rule [75 FR 45210]. On July 6, 2011, EPA finalized the Transport Rule, now commonly referred to as the Cross-State Air Pollution Rule (CSAPR) [76 FR 48208, 08AUG2011] in time for reductions to begin in 2012. As finalized, the CSAPR would have preserved the initial reductions achieved under CAIR and provide more reductions in NO_x and SO_2 emissions in 2012 and 2014, ahead of the 2015 CAIR Phase 2.

West Virginia DAQ is in agreement with the analysis by U.S. EPA that the CAIR program provided real significant reductions. We believe these reductions have assisted with $PM_{2.5}$ attainment in this nonattainment area and throughout West Virginia. It is also the DAQ's firm belief that the CSAPR, or its replacement, will continue to provide the necessary reductions, and likely even greater reductions, that will be necessary for maintenance of the annual $PM_{2.5}$ standard to continue. As stated by EPA regarding the final Transport Rule or CSAPR:

> This rule will prohibit all significant contribution to nonattainment and interference with respect to the annual and 24-hour $PM_{2.5}$. In addition, it will resolve air quality issues at most nonattainment and maintenance receptors identified by EPA. EPA projects that unresolved nonattainment and maintenance issues will remain in only a few downwind states after promulgation and implementation of the Transport Rule. For the annual $PM_{2.5}$ standard, EPA projects that this rule will help assure that all areas in the east fully resolve their nonattainment and maintenance concerns. This rule will also help a number of areas achieve the standard earlier than they may have otherwise. [76 FR 48247]

However, on August 21, 2012, the US Court of Appeals for the DC Circuit vacated "the Transport Rule and the Transport Rule FIPS" and remanded the Transport Rule to EPA. The court also required that "EPA must continue administering CAIR pending promulgation of a valid replacement."

DAQ has considered the Integrated Planning Model (IPM) emission projections for the EGUs (Amos and Kanawha River Power Stations) in the Charleston area under CAIR and CSAPR. On their website [http://www.epa.gov/airmarkets/progsregs/epa-ipm/index.html] EPA states:

> EPA uses the Integrated Planning Model (IPM) to analyze the projected impact of environmental policies on the electric power sector in the 48 contiguous states and the District of Columbia. Developed by ICF Consulting, Inc. and used to support public and private sector clients, IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and environmental, transmission, dispatch, and reliability constraints. IPM can be used to evaluate the cost and emissions impacts of proposed policies to limit emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), carbon dioxide (CO_2), and mercury (Hg) from the electric power sector. The IPM was a key analytical tool in developing the proposed Transport Rule.

The Kanawha River Power Station (Kanawha River), located in Kanawha County and the John E. Amos (Amos) Power Station, located in Putnam County are owned by American Electric Power (AEP). Under CAIR for 2020 EPA, using IPM projected 8,431tons of NO_x and 29,227 tons of SO_2 from these facilities. Under CSAPR, for the same facilities in 2020 using IPM, EPA projected emissions of 10,315 tons of NO_x and 18,083 tons of SO_2 [http://www.epa.gov/airmarkets/progsregs/epa-ipm/cair/index.html, see IPM Parsed File EPA Final CAIR parsed for year 2020 (Final CAIR modeling)]. While the projections do not match exactly, both projections show significant reductions in both NO_x and SO_2 and the DAQ believes that CAIR or any likely replacement for CAIR, will constrain NO_x and SO_2 emissions sufficiently to ensure that maintenance level emissions are not exceeded during the maintenance period. (Incidently, due to atmospheric chemistry, the SO_2 reductions are likely to have a greater impact on decreasing $PM_{2.5}$ concentrations in this area than the increase in NO_x would have in potentially causing any increase in $PM_{2.5}$).

Amos has two 800 megawatt (MW) units [Units 1 and 2] and one 1,300 MW unit [Unit 3]. Amos implemented changes beginning with the installation of SCRs in 2003-2005, the year round operation of the SCRs in 2008 and 2009, and the installation of FGDs in 2009-2011. These controls are federally enforceable since Amos is required by a federal consent decree (see Appendix E) to install and continuously operate FGDs to reduce SO_2 emissions on Units 1 and 3 beginning December 31, 2009, and on Unit 2 beginning December 31, 2010; and to install and continuously operate SCRs to reduce NO_x emissions on Units 1 and 3 beginning January 1, 2008 and on Unit 2 beginning January 1, 2009. Thus, all three units have installed high-level control technologies for both NO_x and SO_2 and are required to operate them through a federally enforceable consent decree.

Furthermore, on June 9, 2011, AEP announced the planned shutdown of Kanawha River by December 31, 2014. [AEP Press Release, http://www.aep.com/newsroom/newsreleases/?id=1697] Under CAIR, EPA had projected emissions from Kanawha River in 2020 to be 855.5 tons of NO_x and 1,711 tons of SO_2, and under CSPAR, had projected emissions of 3,492 tons of NO_x and 4,771 tons of SO_2. Since the planned shutdown of Kanawha River was not accounted for in EPA's projections, the EGU emissions estimates are conservative (i.e. projected emissions were likely significantly overestimated).

In addition, as shown in Section VI - Supplemental Modeling Analyses, recent modeling -- CAIR, proposed Transport Rule, CSAPR (Final Transport Rule), including base cases where CAIR and CSAPR were not considered to be applicable requirements, and the VISTAS/ASIP modeling (which includes CAIR) -- all show that the Charleston area will continue to maintain the 1997 $PM_{2.5}$ NAAQS.

It is West Virginia DAQ's belief that it is most appropriate to evaluate West Virginia's demonstration that the projected level of emissions is sufficient to maintain the annual $PM_{2.5}$ standard by assessing future year emissions that include the CSAPR program. Furthermore, modeling conducted as part of the Transport Rule development (both the proposed Transport Rule and the Final Transport Rule, or CSAPR) projects the counties within this area will not have maintenance issues in 2014 even without the Transport Rule (proposed or final) or CAIR. Therefore, West Virginia DAQ is identifying emissions projections for 2015 and 2022 for EGUs with implementation of the CSAPR program.

Emission projections for the Charleston area were performed using the following approaches:

- Emissions inventories are required to be projected to future dates to assess the influence of future growth and controls.

- NonEGU Point, Area, and Locomotive/Marine Source inventories for 2015 and 2022 were developed by DAQ based on the 2008 inventory using Workforce West Virginia economic forecasts (http://www.workforcewv.org/LMI/indproj/longterm/WV.htm). The Workforce WV projections were in terms of North American Industrial Classification System (NAICS) codes while the WV 2008 v1.5 data is in terms of SCCs. A list of SCCs contained in the 2008 WV inventory was compiled and the associated with each NAICS code for which there was a Workforce WV growth factor. Then directly proportional growth factors were calculated and applied to Workforce WV's 2018 growth factor to calculate 2015 and 2022 emissions. The final estimates reflect both positive and negative growth. The 2008 NEI data were downloaded from EPA's CHIEF webpage at http://www.epa.gov/ttn/chief/net/2008inventory.html.

- Nonroad mobile source inventories for those categories calculated by the model were developed by DAQ personnel using monthly NONROAD Model runs for 2015 and 2022, and summing the monthly data to obtain annual data.

- The highway (onroad mobile) emission projections were developed by the consultant, Michael Baker Jr. Inc., under contract to the WV Department of Transportation (WVDOT) and the responsible Metropolitan Planning Organization (MPO), the Regional Intergovernmental Council (RIC). These projections used the most recent transportation planning information and assumptions that were available at the beginning of the analysis. (See Appendix C.)

The detailed inventory information for the Charleston area for 2005 is contained in Appendices B and C. Emission trends are an important gauge for continued compliance with the $PM_{2.5}$ standard. Therefore, West Virginia DAQ performed an initial comparison of the inventories for the base year and maintenance years.

Sectors included for West Virginia in the following tables are: Electrical Generating Unit (EGU); Non-Electrical Generating Units including Airports (Non-EGU); Non-road Mobile (Nonroad); Other Area (Area); Locomotive and Marine (LM); and Onroad Mobile (Onroad).

Maintenance is demonstrated when the future-year (2025) projected emission totals of each of the relevant pollutants are below the 2008 attainment year totals.

The West Virginia emissions data in the tables below are based on the following data sources:

- All On-Road (highway) data developed by Michael Baker Jr. Inc., under contract to the WV Department of Transportation (WVDOT) and the responsible Metropolitan Planning Organization (MPO), the Regional Intergovernmental Council (RIC).

- 2005 and 2008 EGU and non-EGU Point Source from certified data submitted by industry to West Virginia DAQ's 2005 and 2008 annual emissions inventory database and subsequently submitted to EPA.

- WV Nonroad data developed by DAQ using EPA's Nonroad Model v2008.1.0.

- All other West Virginia data developed by DAQ based on Workforce WV economic projections.

A. $PM_{2.5}$ Emissions Demonstrations

The 2005 and 2008 actual $PM_{2.5}$ EGU and NonEGU emissions data below reflects $PM_{2.5}$-primary emissions. Although some facilities reported both $PM_{2.5}$-pri and the PM fraction emissions, not all facilities reported $PM_{2.5}$-pri emissions. When $PM_{2.5}$-pri was not reported by sources, WV DAQ applied PM augmentation procedures in accordance with EPA procedures as documented in EPA's CSAPR technical support document (TSD), "*Emissions Inventory Final Rule TSD*, June 28, 2011" and discussed in more detail in Appendix B and with further technical support provided by EPA's Emission Inventory and Analysis Group (EIAG).

Table 3: Kanawha County, WV $PM_{2.5}$ Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)

Sector	2005 (Base)	2008 Attainment	2018 Interim	2018 Safety Margin*	2025 Maintenance	2025 Safety Margin
EGU	552	659	213	**446**	231	**428**
NonEGU	210	133	126	**7**	121	**12**
Area	1,796	1,658	1,625	**33**	1,601	**57**
LM	65	168	171	**-3**	171	**-3**
Nonroad	99	94	77	**18**	72	**22**
Onroad	282	214	88	**126**	64	**149**
TOTAL	**3,004**	**2,926**	**2,299**	**627**	**2,260**	**666**

Totals may not sum exactly due to rounding.

Table 4: Putnam County, WV $PM_{2.5}$ Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
Sector	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin***	**2025 Maintenance**	**2025 Safety Margin**
EGU	4,250	3,700	2,898	802	2,891	809
NonEGU	9	10	10	0	10	0
Area	772	608	599	9	592	16
LM	14	86	88	-1	88	-1
Nonroad	21	18	12	6	10	8
Onroad	69	54	24	31	18	37
TOTAL	**5,135**	**4,477**	**3,631**	**846**	**3,609**	**868**

Totals may not sum exactly due to rounding.

Table 5: Charleston Nonattainment Area $PM_{2.5}$ Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
County	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin***	**2025 Maintenance**	**2025 Safety Margin**
Kanawha, WV	3,004	2,926	2,299	627	2,260	666
Putnam, WV	5,135	4,477	3,631	846	3,609	868
Charleston NAA $PM_{2.5}$ Total	**8,139**	**7,403**	**5,929**	**1,474**	**5,869**	**1,534**

Totals may not sum exactly due to rounding.

* Under the Transportation Conformity Rule (40CFR93.101), *Safety margin* means the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance (emphasis added). Thus, in the context of the maintenance plan, there may be safety margins associated with the 2018 interim year and separate safety margins associated with the 2025 end year. These safety margins are calculated by subtracting the 2018 total emissions (for a given pollutant) and the 2025 total emissions (for a given pollutant), respectively, from the 2008 attainment year total emissions (for a given pollutant). We may refer to the results for a given pollutant/precursor as the *2018 safety margin* and the *2025 safety margin*, respectively.

** The individual sector "safety margins" are not the safety margins as defined by the conformity rule and are shown for comparison to the total area emissions and "true" safety margins. They are merely the difference between the 2008 attainment emissions and the projected emissions in 2018 and 2025, respectively.

B. NO_x Emissions Demonstrations

Table 6: Kanawha County, WV NO_x Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
Sector	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin**	**2025 Maintenance**	**2025 Safety Margin**
EGU	3,602	4,162	3,352	**810**	3,635	**527**
NonEGU	8,309	6,060	5,723	**337**	5,503	**557**
Area	1,520	786	770	**16**	759	**27**
LM	1,946	4,979	5,055	**-76**	5,055	**-76**
Nonroad	758	700	430	**270**	381	**319**
Onroad	8,750	6,729	2,600	**4,129**	1,789	**4,940**
TOTAL	**24,884**	**23,415**	**17,931**	**5,485**	**17,121**	**6,294**

Totals may not sum exactly due to rounding.

Table 7: Putnam County, WV NO_x Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
Sector	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin**	**2025 Maintenance**	**2025 Safety Margin**
EGU	34,624	13,393	6,835	**6,558**	6,823	**6,570**
NonEGU	57	59	49	**11**	43	**16**
Area	207	186	179	**6**	175	**11**
LM	2,528	2,528	2,567	**-39**	2,567	**-39**
Nonroad	214	197	113	**84**	88	**108**
Onroad	2,026	1,609	657	**951**	473	**1,136**
TOTAL	**39,657**	**17,972**	**10,401**	**7,572**	**10,169**	**7,803**

Totals may not sum exactly due to rounding.

Table 8: Charleston Nonattainment Area NO_x Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
County	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin**	**2025 Maintenance**	**2025 Safety Margin**
Kanawha, WV	24,884	23,415	17,931	5,485	17,121	6,294
Putnam, WV	39,657	17,972	10,401	7,572	10,169	7,803
Charleston NAA NO_x Total	**64,541**	**41,387**	**28,331**	**13,056**	**27,291**	**14,096**

Totals may not sum exactly due to rounding.

C. SO_2 Emissions Demonstrations

Table 9: Kanawha County, WV SO_2 Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
Sector	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin***	**2025 Maintenance**	**2025 Safety Margin***
EGU	12,851	15,426	4,580	**10,846**	4,967	**10,459**
NonEGU	5,488	4,593	4,273	**320**	4,063	**531**
Area	1,274	977	904	**73**	853	**125**
LM	99	253	257	**-4**	257	**-4**
Nonroad	57	10	2	**9**	2	**9**
Onroad	173	47	20	**27**	19	**28**
TOTAL	**19,941**	**21,307**	**10,037**	**11,271**	**10,160**	**11,147**

Totals may not sum exactly due to rounding.

Table 10: Putnam County, WV SO_2 Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
Sector	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin**	**2025 Maintenance**	**2025 Safety Margin**
EGU	112,426	93,533	13,163	**80,370**	13,208	**80,325**
NonEGU	0	2	3	**0**	3	**0**
Area	123	202	187	**15**	177	**25**
LM	32	138	141	**-2**	141	**-2**
Nonroad	20	3	0	**3**	0	**3**
Onroad	41	12	5	**7**	5	**7**
TOTAL	**112,641**	**93,891**	**13,499**	**80,392**	**13,534**	**80,357**

Totals may not sum exactly due to rounding.

Table 11: Charleston Nonattainment Area SO_2 Emission Inventory Totals for 2005, 2008, 2018 and 2025 (tpy)						
County	**2005 (Base)**	**2008 Attainment**	**2018 Interim**	**2018 Safety Margin**	**2025 Maintenance**	**2025 Safety Margin**
Kanawha, WV	19,941	21,307	10,037	**11,271**	10,160	**11,147**
Putnam, WV	112,641	93,891	13,499	**80,392**	13,534	**80,357**
Charleston NAA SO_2 Total	**132,583**	**115,198**	**23,535**	**91,663**	**23,694**	**91,504**

Totals may not sum exactly due to rounding.

D. Summary of $PM_{2.5}$, NO_x, and SO_2 Emission Reductions

Table 12: Charleston Area Comparison of 2008 attainment year and 2018 and 2025 projected emission estimates (tpy)					
	2008 Attainment	**2018 Interim**	**2018 Projected Decrease**	**2025 Maintenance**	**2025 Projected Decrease**
$PM_{2.5}$	7,403	5,929	1,474	5,869	1,534
NO_x	41,387	28,331	13,056	27,291	14,097
SO_2	115,198	23,535	91,663	23,694	91,504

Totals may not sum exactly due to rounding.

As shown in the table above (Table 12), $PM_{2.5}$ emissions in the nonattainment area are projected to decrease by 1,474 tons in 2018 and 1,534 tons in 2025. NO_x emissions in the nonattainment area are projected to decrease by 13,056 tons in 2018 and 14,097 tons in 2025. SO_2 emissions in the nonattainment area are projected to decline by 91,663 tons in 2018 and 91,504 tons in 2025.

The Charleston area shows a net reduction in $PM_{2.5}$, NO_x and SO_2 emissions; cleaner vehicles and fuels are expected to be in place in 2018 and 2025; and the CAIR Replacement Rule should be implemented by 2018 and these programs should cause an overall drop in all three pollutants emissions. Decreases from EPA rules covering Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements [65 FR 6698,10FEB2000], Highway Heavy-Duty Engine Rule [62 FR 54694, 21OCT1997], and the Non-Road Diesel Engine Rule [63 FR 56968, 23OCT1998] are factored into the changes.

E. Air Quality Improvement is Based on Permanent and Enforceable Emission Reductions

A demonstration that improvement in air quality between the year violations occurred and the year attainment was achieved is based on permanent and enforceable emission reductions and not on temporary adverse economic conditions or unusually favorable meteorology.

Ambient air quality data from all monitoring sites indicate that air quality met the NAAQS for $PM_{2.5}$ in 2007-2009, 2008-2010 and in 2009-2011. EPA's redesignation guidance (Policy Memo from John Calcagni, Director, Air Quality Management Division to Regional Air Directors: *Air Procedures for Processing Requests to Redesignate Areas to Attainment*), dated September 4, 1992 (p. 9) states: "A state may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emissions rates will not cause a violation of the NAAQS."

Permanent and enforceable reductions of $PM_{2.5}$, NO_x, and SO_2 emissions have contributed to the attainment of the annual $PM_{2.5}$ standard. Some of these reductions were realized due to the application of tighter federal standards on highway heavy-duty engines (Control of Emissions of Air Pollution from Highway Heavy Duty Engines) and Nonroad diesel engines (Control of Emissions of Air Pollution from Nonroad Diesel Engines), the application of tighter federal standards on new vehicles (Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emission Standards and Gasoline Sulfur Control Requirements), Title IV of the CAA, the NO_x SIP Call, CAIR, CSAPR, and federal consent decrees requiring reductions of SO_2 and NO_x emissions from utility sources. Reductions achieved are discussed in greater detail under Section V.

Table 13: Charleston Area Comparison of 2005 Nonattainment Year and 2008 Attainment Year Reductions by Sector			
	2005	**2008**	**Decrease**
EGU NO_x	38,226	17,555	20,671
EGU $PM_{2.5}$	4,802	4,359	443
EGU SO_2	125,276	108,959	16,317
Onroad NO_x	10,776	8,337	2,439
Onroad $PM_{2.5}$	351	268	83
Onroad SO_2	214	59	155
Nonroad NO_x	973	897	76
Nonroad $PM_{2.5}$	119	113	6
Nonroad SO_2	76	14	62

F. Emissions Tracking

Provisions for future annual updates of the inventory to enable tracking of the emission levels, including an annual emission statement from major sources.

In West Virginia, major point sources in all counties are required to submit air emissions information annually. West Virginia DAQ prepares a new periodic inventory for all $PM_{2.5}$ precursor emission sectors every three years in accordance with EPA's Air Emissions Reporting Requirements (AERR). These $PM_{2.5}$ precursor inventories will be prepared for future years as necessary to comply with the inventory reporting requirements established in the CFR. Emissions information will be compared to the 2005 base year and the 2025 projected maintenance year inventories to assess emission trends, as necessary, and to assure continued compliance with the annual $PM_{2.5}$ standard.

IV. TRANSPORTATION ANALYSIS

A. Onroad Emission Estimations

This section provides an overview of the on-road (highway) mobile source emissions inventory for the Charleston, West Virginia $PM_{2.5}$ non-attainment area consisting of Kanawha and Putnam counties. The inventory was developed using EPA's Motor Vehicle Emission Simulator (MOVES) model. The section includes a summary of the methodology and data assumptions used for the analysis. More details are provided in Appendix C. The voluminous inputs and outputs of the MOVES model and related post-processing files will be made available to interested parties, upon written request, via e-mail to: Tammy.L.Mowrer@wv.gov.

The air quality analyses and underlying planning assumptions were developed by the responsible MPO (Regional Intergovernmental Council, RIC), their consultant (Michael Baker Jr. Inc.), and the WVDOT, in consultation with the West Virginia Department of Environmental Protection (WVDEP), as well as the federal partners, the Federal Highways Administration (FHWA) and EPA. This evaluation represents the latest population and land use data available that calibrated the modeling process used to calculate the vehicle emissions for the mobile emissions budgets as well as the input values for U.S. EPA's most recent emissions software (MOVES) for this attainment demonstration. Interagency consultation occurred at several key points pursuant to the requirements of the federal Transportation Conformity Rule (40 CFR 93 Subpart A).

B. Onroad Mobile Emissions Summary

A travel demand model (TDM) is the traditional tool used to examine potential changes in future travel patterns. It generates travel characteristics which are then input into the emissions estimation model. Ultimately, that output is further input into a post processor to make the final emissions estimates. The road networks within the TDM include all planned federal-aid projects as well as any regionally significant projects found in the Transportation Improvement Plan (TIP) and the Long Range Transportation Plan (LRTP) expected to be open for traffic by the end of each respective analysis year. All projects identified in the LRTP having an impact on travel time and/or vehicle carrying capacity regardless of funding source were included in the air quality analysis. Trip generation figures by zone, with some exceptions, are assumed to change linearly with time between 2000 and the Plan Horizon year of 2040.

The RIC travel demand model follows the basic "four-step" travel demand forecasting process and utilizes the TransCAD software platform. Given the small portion of daily travel carried by the bus (transit) system in the Charleston region, a separate mode choice or transit model is not included. Auto-occupancy factors are used to convert person trips into vehicle trips.

The model is driven by socio-economic and transportation network data. These data include items such as zonal population, households, income, school enrollment, and employment by type for over 400 zones defined in the region. Transportation network data includes facility type, length, and speed limit for each of the highway links defined in the region. The highway network database contains attributes for each individual line in the line layer and includes all attributes needed to perform a traffic assignment. The travel model and associated land use inputs used for this inventory were based on the assumptions used for the 2040 LRTP submitted in December 2009 (by RIC to FHWA).

The travel model network and assigned traffic volumes are processed by the PPSUITE post processor to prepare the traffic inputs needed to the MOVES emission model. The following information is extracted from the model for emission calculations:

Figure 6: Demographic Growth Assumptions to the Travel Model

	SE Data Categories						
Year	Households	School Enrollment	Basic Employees	Retail Employees	Service Employees	Government Employees	Total Employees
2000	106,170	37,111	30,169	34,517	52,569	15,621	132,876
2007	108,812	35,666	24,521	29,955	56,814	12,361	123,651
2009	109,844	36,732	26,004	31,899	59,541	12,786	130,230
2010	110,370	37,264	26,741	32,863	60,899	12,992	133,495
2013	113,212	37,585	27,186	33,500	61,334	12,952	134,972
2015	115,105	37,802	27,490	33,938	61,633	12,931	135,992
2018	116,206	38,293	28,215	34,798	62,412	12,942	138,367
2020	116,944	38,613	28,691	35,391	62,955	12,955	139,992
2025	119,129	39,704	29,627	36,630	64,039	12,939	143,235
2030	120,861	41,098	30,574	37,860	65,121	12,928	146,483
2035	123,167	42,822	31,425	39,088	66,098	12,887	149,498
2040	125,440	44,899	32,091	40,168	68,894	12,842	151,995

- lanes
- roadway capacity
- distance
- weekday traffic volume
- area type code
- facility class code

The volumes and distances are used in calculating highway VMT totals for each county. Forecast traffic volumes from the regional travel model are based on the input demographic, shown in Figure 6. The lane values, capacities, area type, and facility class are important inputs for determining the congestion and speeds for individual highway segments. The PPSUITE processing software allows for many additional variables other than those available in the regional travel model. Using these variables improves the calculation of congested speeds. Such variables include information regarding free-flow speeds, traffic signal and control parameters, and volume-delay functions. This data is determined from lookup tables based on the model link's area type and facility class. Much of the lookup table data was developed from information contained in the Highway Capacity Manual.

C. Roadway Data

The roadway data input to emissions calculations for this inventory is based on information from the RIC regional travel demand model. The travel model, illustrated in Figure 7, and associated land use inputs were based on the assumptions used for the 2040 LRTP submitted in December 2009. The travel model estimates roadway volumes based on input demographic (e.g. population, households, employment) forecasts and expected changes to the transportation roadway network.

Figure 7: Charleston Transportation Planning Area covered by the RIC Regional Travel Demand Model

The interagency consultation process, as previously discussed, established the following model years for Kanawha and Putnam Counties that reflected the most recent correspondence from the U.S. EPA:

Analysis Year 2005 - Baseline Emissions
Analysis Year 2008 - Attainment Year
Analysis Year 2018 - Interim Year
Analysis Year 2025 - Maintenance Year

D. Emissions Model

MOVES (Motor Vehicle Emissions Simulator) is a computer program designed by the EPA to estimate air pollution emissions from highway mobile sources. EPA published a Federal Register notice of availability [75 FR 9411] on March 2, 2010, to approve MOVES2010, hereafter referred to as MOVES. Upon publication of the Federal Register notice, MOVES became EPA's approved motor vehicle emission factor model for use by state and local agencies to estimate VOCs, NO_x, CO, PM_{10} and $PM_{2.5}$ and other pollutants and precursors from cars, trucks, motorcycles, and buses. MOVES replaces EPA's previous emissions model, MOBILE6.2. MOVES can be used to estimate exhaust and evaporative emissions as well as brake and tire wear emissions from all types of on-road vehicles. An updated version of this software, MOVES2010a, was used for this analysis. MOVES2010a is a minor update to MOVES2010. MOVES2010a includes general performance improvements to MOVES2010, and also allows users to account for emissions under new car and light truck energy and greenhouse gas standards.

EPA believes that MOVES should be used in ozone, carbon monoxide, PM, and nitrogen dioxide SIP development as expeditiously as possible. The CAA requires that SIP inventories and control measures be based on the most current information and applicable models that are available when a SIP is developed.

The MOVES model generated the emission factor files for base year-2005 and attainment year-2008 representing the transportation improvement programs implemented in the RIC Region. The model also generated emission factors for two future year scenarios 2018 and 2025, based on RIC's LRTP at the time that SIP development began. Table 14 summarizes the settings used in the MOVES run specification file and the MOVES County-Data Manager. Highway emissions are a complex function of fleet characteristics (e.g. type and age), fuels (gasoline/diesel), activity (vehicle miles traveled, VMT), heavy duty vehicle idling, congestion, aggressive driving and environmental factors (temperature and humidity).

1. Temperature and Relative Humidity

Meteorological conditions, especially temperature and humidity, significantly affect on-road vehicle emissions. A series of Inter-Agency Consultation conference calls were held during the winter of 2010/2011 which established two important conclusions, among others. First, this redesignation effort required the use of MOVES software for all mobile source emission analyses. And second, the annual emission estimates would be based upon a single-season temperature/humidity approach. The single season approach for temperature and relative humidity uses an annual average of weather data collected by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC). The data used in this report, taken from the Yeager Airport collection center, is representative of all 12 months in 2009.

2. Vehicle Class Data

Emission rates within MOVES vary significantly by the type of vehicle. The MOVES model produces emissions and rates by thirteen MOVES vehicle source types. However, VMT is input to MOVES by six HPMS vehicle groups. Table 14 summarizes the distinction between each classification scheme.

Table 14: MOVES Source Types and HPMS Vehicle Groups

SOURCE TYPES		HPMS Class Groups	
11	Motorcycle	10	Motorcycle
21	Passenger Car	20	Passenger Car
31	Passenger Truck	30	Passenger/Light Truck
32	Light Commercial Truck	40	Buses
41	Intercity Bus	50	Single Unit Trucks
42	Transit Bus	60	Combination Trucks
43	School bus		
51	Refuse Truck		
52	Single Unit Short-haul Truck		
53	Single Unit Long-haul Truck		
54	Motor Home		
61	Combination Short-haul Truck		
62	Combination Long-haul Truck		

For this regional inventory, vehicle type pattern data was developed for each county and facility class combination based on WVDOT classification counts and internal MOVES defaults. As the first step, WVDOT truck count data was used to develop percentage splits of the total volume to the following vehicle groups:

1. autos
2. heavy trucks and buses

MOVES default VMT by HPMS vehicle type (for Kanawha and Putnam counties) were then used to split the above vehicle groups (autos and trucks) into the 6 HPMS vehicle classes needed by MOVES.

The vehicle type percentages are also provided to the capacity analysis section of PPSUITE to adjust the speeds in response to trucks. That is, a given number of larger trucks take up more roadway space than a given number of cars, and this is accounted for in the speed estimation process by adjusting capacity using information from the Highway Capacity Manual.

3. Vehicle Ages

Vehicle age distributions are input to MOVES for each county by the thirteen source types. The distributions reflect the percentage of vehicles in the fleet up to 31 years old. The vehicle age distributions were prepared by DAQ based on information obtained from West Virginia motor vehicle registration data. MOVES default values were used for source types 41, 42, 51, 52, 53, 61, and 62, which includes all heavy trucks and buses.

4. Vehicle Population Data

The information on the vehicle fleet, including the number and age of vehicles, impacts forecasted start and evaporative emissions within MOVES. Similar to vehicle ages, MOVES requires the population of vehicles by the thirteen source type categories. The MOVES national default values provided the data for source types 51, 52, 53, 61 and 62. All other light-duty vehicles, buses and motor homes were developed based on West Virginia motor vehicle registration data. This data was prepared by DAQ based on 2010 registration data.

For the preparation of source type population for other years, the 2010 values were adjusted using growth factors based on historic and forecast population, household and employment for the region from the Woods and Poole 2012 State Profile. For light-duty vehicles, growth rates were developed based on the maximum of the household and population growth in Kanawha and Putnam counties. For heavy trucks, growth rates were determined by selecting the maximum of the household, population and employment growth for each county.

5. Environmental and Fuel Data

Information on environmental, fuel, vehicle technology and other control strategy assumptions were determined based on a review of MOVES2010a default information and other available local data. Average monthly minimum and maximum temperatures were obtained from the South East Regional Climate Center (SERCC). EPA's MOBILE6.2-MOVES meteorological data convertor spreadsheet (available from http://www.epa.gov/oms/models/moves/tools.htm) was used to prepare the hourly temperature inputs needed for the MOVES model based on the available data. MOVES default humidity values were used for the region.

MOVES default fuel assumptions were updated with the following local data assumptions by season:

Summer (months 5-10): RVP=10 for E10 fuel; RVP=9 for conventional gasoline
Winter (months 1,2,12): RVP=14
Other (months 3,4,11): Uses MOVES default RVP that varies by year

The MOVES defaults included a 43% market share of E10 fuel in 2008 and a 100% market share of E10 fuel in future analysis years.

6. Other Vehicle Technology and Control Strategy Data

West Virginia does not have a vehicle inspection maintenance program and there are no state vehicle technology strategies included in the highway emissions inventory. Current federal vehicle emissions control and fuel programs are incorporated into the MOVES2010a software. These include the National Program standards covering model year vehicles through 2016. Modifications of default emission rates are required to reflect the early implementation of the National Low Emission Vehicle Program (NLEV) program in West Virginia. To reflect these impacts, EPA has released instructions and input files that can be used to model these impacts. This inventory utilized the August 2010 version of the files (http://www.epa.gov/oms/models/moves/tools.htm). Appendix C provides the details pertaining to many of the above parameters. MOVES is implemented by constructing a MOVES Run Specification (MRS) file and, for SIP & transportation conformity purposes, importing localility adjusted input databases for the software to use in its emission calculations.

Table 15: Example MOVES Inputs

Data Item	Inputs Assumptions
MOVES Run Spec	
Scale/Calulation Type	County Scale Inventory Run
Analysis Counties	Kanawha (FIPS: 54039), Putnam (FIPS: 54079)
Analysis Days/Months	Annual - 12 months including weekdays and weekends (using AADT approach)
Analysis Years	**2005, 2008, 2018, 2025**, *2040 (for out year evaluation)*
Pollutants	$PM_{2.5}$, NOx, SO_2
Stage II Refueling Emissions	Not Included
Fuel Types	Gasoline, Diesel, CNG
Traffic Data	
Highway Network	Base networks are those used for past Charleston LRTP analyses and conformity 2005: Interpolate socio-economic inputs between 2002 and 2007; use 2002 network inputs 2008: Interpolate socio-economic inputs between 2007 and 2009; use 2007 network inputs 2018, 2025, 2040: Socio-economic forecast and network inputs are available from last LRTP
Seasonal/Daily Adjustments	Factors to convert monthly weekday volumes (e.g. travel model) to AADT; Monthly and daily seasonal adjustment factors recived from WVDOH and used as inputs
County HPMS VMT Adjustments	Calculate AADT HPMS adjustments for 2005 and 2008 (Ensure VMT for past years is consistent with reported HPMS); HPMS VMT obtained from WVDOH website
Vehicle Mixes	MOVES VMT required by 6 HPMS vehicle classes. Use WVDOT truck count data to determine average truck percentages by functional class; Split model traffic volumes into auto and trucks using these percentages and then use MOVES default VMT distributions for the Charleston region to divide the two vehicle groups (auto and trucks) into MOVES 13 source types, which are recombined to the 6 HPMS vehicle classes.
MOVES Inputs	
Annual VMT	Calculated by PPSUITE from model / seasonal factors / vehicle mapping
Avg. Hourly Speed Distribution	Calculated by PPSUITE (Minimum Speed = 2.5 mph); Based on model volumes and speed post processing by hour of day.
Road Type Distribution	Calculated by PPSUITE; a RoadType field must be added to the travel model network based on FC.
Ramp Fraction	Calculated by PPSUITE (use ramp classes coded in model network)
Month VMT Fractions	Factors to convert AADT to an average day in each month (Local data or MOVES default). Calculated based on seasonal adjustment factors.
Day VMT Fractions	PM: Based on AADT assumption (i.e. 5/7 & 2/7) Ozone: Calculated based on seasonal adjustment factors
Hour VMT Fractions	Factors to disaggregate daily traffic volumes by hour for different roadway functional classes. Borrow hourly distributions from other region.
Source Type Population	2010 Inputs provided by WVDEP --> Adjust/grow to 2005, 2008, 2018 and 2025 by applying growth factors developed from Woods & Poole population/households/employment forecast data. (For non-trucks: maximum of households & population growth. For trucks: maximum of households, population & employment growth)
Vehicle Age Distribution	Source Types 11, 21, 31, 32 & 54: based on 2010 WV DMV Registration Data; Source Types 41, 42, 43, 51, 52, 53, 61 & 62: use MOVES National Defaults.
Fuel Parameters (Gasoline/Diesel/CNG)	Use MOVES defaults with the following updates to RVP: 1. Summer (months 5 - 10): RVP = 10 for E10 and RVP = 9 for conventional gasoline 2. Winter (months 1, 2, 12): RVP = 14 3. Months 3, 4 & 11: Use MOVES default RVP which varies by year - 10.783 in 2005, 11.617 in 2008, and 12.729 in future years. (Note: MOVES defaults include 43% market share of E10 in 2008 and 100% market share of E10 in future years)
I/M Parameters	No I/M programs
Temperatures/Humidity	Temperatures: Use monthly average Max/Mins provided by WVDEP as inputs to EPA's Mobile6-MOVES converter to develop inputs in MOVES format. Humidity: MOVES defaults
Control Programs	
Early NLEV / CALLEVII	Include EPA provided MOVES override database for early NLEV implementation
Stage II Refueling Paramters	Not Included

E. Onroad Mobile Emission Estimations

Tables 16 through 18 contain the results of the emissions analysis for the appropriate years. All emissions estimations are expressed in tons per year (tpy).

Table 16: Kanawha County, WV Emissions Estimations for Onroad Mobile Sources				
	2005	**2008**	**2018**	**2025**
NO_x (tpy)	8,750	6,729	2,600	1,789
$PM_{2.5}$ (tpy)	282	214	88	64
SO_2 (tpy)	173	47	20	19
Annual VMT	2,583,487,730	2,576,374,821	2,892,207,759	3,098,647,075

Table 17: Putnam County, WV Emissions Estimations for Onroad Mobile Sources				
	2005	**2008**	**2018**	**2025**
NO_x (tpy)	2,026	1,609	657	473
$PM_{2.5}$ (tpy)	69	54	24	18
SO_2 (tpy)	41	12	5	5
Annual VMT	602,215,060	621,911,891	717,994,235	785,642,154

Table 18: Summary of Charleston Area Emissions Estimations for Onroad Mobile Sources				
	2005	**2008**	**2018**	**2025**
NO_x (tpy)	10,776	8,338	3,258	2,262
$PM_{2.5}$ (tpy)	351	268	112	82
SO_2 (tpy)	214	59	25	24
Annual VMT	3,185,702,790	3,198,286,712	3,610,201,993	3,884,289,229

The following table shows the emissions totals, by sector, for each county in the nonattainment area. For a more detailed analysis see Appendix C.

Table 19: Percentage of Charleston Emissions Attributable to Mobile Sources in 2005, 2008, 2018 and 2025

Percentage of Charleston NAA Emissions Attributable to Mobile Sources for 2005, 2008, 2018 and 2025																
			NOx				PM2.5				SO2					
NAA	County	Sector	2005	2008	2018	2025	2005	2008	2018	2025	2005	2008	2018	2025		
Charleston NAA	Kanawaha	Point - EGU	3,602	4,162	3,352	3,635	552	659	213	231	12,851	15,426	4,580	4,967		
	Kanawaha	Point - NonEGU	8,309	6,060	5,723	5,503	210	133	126	121	5,488	4,593	4,273	4,063		
	Kanawaha	Area	1,520	786	770	759	1,796	1,658	1,625	1,601	1,274	977	904	853		
	Kanawaha	LM	1,946	4,979	5,055	5,055	65	168	171	171	99	253	257	257		
	Kanawaha	NonRoad	758	700	430	381	99	94	77	72	57	10	2	2		
	Kanawaha	OnRoad	8,750	6,729	2,600	1,789	282	214	88	64	173	47	20	19		
	Kanawaha	**Subtotal**	**24,884**	**23,415**	**17,931**	**17,121**	**3,004**	**2,926**	**2,299**	**2,260**	**19,941**	**21,307**	**10,037**	**10,160**		
	Kanawha Onroad Percentages		**35.16%**	**28.74%**	**14.50%**	**10.45%**	**9.40%**	**7.30%**	**3.83%**	**2.85%**	**0.87%**	**0.22%**	**0.20%**	**0.19%**		
	Putnam	Point - EGU	34,624	13,393	6,835	6,823	4,250	3,700	2,898	2,891	112,426	93,533	13,163	13,208		
	Putnam	Point - NonEGU	57	59	49	43	9	10	10	10	0	2	3	3		
	Putnam	Area	207	186	179	175	772	608	599	592	123	202	187	177		
	Putnam	LM	2,528	2,528	2,567	2,567	14	86	88	88	32	138	141	141		
	Putnam	NonRoad	214	197	113	88	21	18	12	10	20	3	0	0		
	Putnam	OnRoad	2,026	1,609	657	473	69	54	24	18	41	12	5	5		
	Putnam	**Subtotal**	**39,657**	**17,972**	**10,401**	**10,169**	**5,135**	**4,477**	**3,631**	**3,609**	**112,641**	**93,891**	**13,499**	**13,534**		
	Putnam Onroad Percentages		**5.11%**	**8.95%**	**6.32%**	**4.65%**	**1.34%**	**1.22%**	**0.66%**	**0.49%**	**0.04%**	**0.01%**	**0.04%**	**0.04%**		
Charleston NAA		Total	64,541	41,387	28,331	27,291	8,139	7,403	5,929	5,869	132,583	115,198	23,535	23,694		
On Road Total			10,776	8,337	3,258	2,262	351	268	112	82	214	59	25	24		
Charleston NAA Onroad Percentages			16.70%	20.15%	11.50%	8.29%	4.31%	3.62%	1.89%	1.40%	0.16%	0.05%	0.11%	0.10%		

Onroad mobile source SO_2 constitutes less than two tenths of one percent (<0.2%) of the area's total SO_2 emissions in the 2018 and 2025 horizon years.

Onroad mobile source NO_x constitutes about twelve percent (12%) and eight percent (8%) of the area's total NO_x emissions in the 2018 and 2025 horizon years, respectively .

Onroad mobile source $PM_{2.5}$ constitutes less than two percent (<2%) of the area's total $PM_{2.5}$ emissions in the 2018 and 2025 horizon years.

F. Transportation Conformity Analysis

The federal Transportation Conformity rule allows pollutants/precursors to be exempt from conformity analysis under certain circumstances.

> 40CFR93.109(k) *Areas with insignificant motor vehicle emissions.* Notwithstanding the other paragraphs in this section, an area is not required to satisfy a regional emissions analysis for §93.118 and/or §93.119 for a given pollutant/precursor and NAAQS, if EPA finds through the adequacy or approval process that a SIP demonstrates that regional motor vehicle emissions are an insignificant contributor to the air quality problem for that pollutant/precursor and NAAQS. The SIP would have to demonstrate that it would be unreasonable to expect that such an area would experience enough motor vehicle emissions growth in that pollutant/precursor for a NAAQS violation to occur. Such a finding would be based on a number of factors, including the percentage of motor vehicle emissions in the context of the total SIP inventory, the current state of air quality as determined by monitoring data for that NAAQS, the absence of SIP motor vehicle control measures, and historical trends and future projections of the growth of motor vehicle emissions. . . [emphasis added]

For the reasons outlined below, the DAQ herein proposes to make a finding that regional highway emissions of $PM_{2.5}$, NO_x and SO_2 are insignificant contributors to the nonattainment problem for the Charleston area. The finding will become final if EPA concurs and approves this SIP.

First, except for NO_x, these regional highway pollutant/precursor emissions constitute a relatively small fraction (<4%) of the base year 2008 overall emissions, as shown in Table 19, above. Previous guidance from U.S. EPA regarding $PM_{2.5}$ attainment demonstrations indicated that 10% is a benchmark for precursors and 5% is a benchmark for direct PM. Subsequent verbal guidance from EPA Region 3 staff indicates that the threshold for significance regarding direct PM may be even lower, about 3%. 40CFR93.109(k) says that emissions should be reviewed "in the context of the total SIP inventory" which may include emission percentages, emission trends and, implicitly, the effectiveness of the pollutant in forming PM. This last item is the reason that the benchmark for direct PM is considerably lower than the benchmark for the precursors. The base year 2008 direct PM contribution is 3.62% but falls significantly in later analysis years to 1.89% (2018) and 1.40% (2025). Therefore, DAQ firmly believes that the initial low contribution of direct PM, in concert with its continuing decline warrants an insignificance finding. However, the DAQ is also soliciting comment on the alternative of establishing motor vehicle emission budgets for direct $PM_{2.5}$. This alternative is discussed in Section E.3, following the discussion regarding NO_x emission budgets.

The significant emission decreases that are projected, not only for the highway sector but also for the total emissions inventory, robustly supports DAQ's position that maintenance will continue with adequate margins throughout the full term of the plan. As the charts below clearly demonstrate, all three pollutants decrease over the period of the maintenance plan and the percent contributions of highway emissions decrease as well.

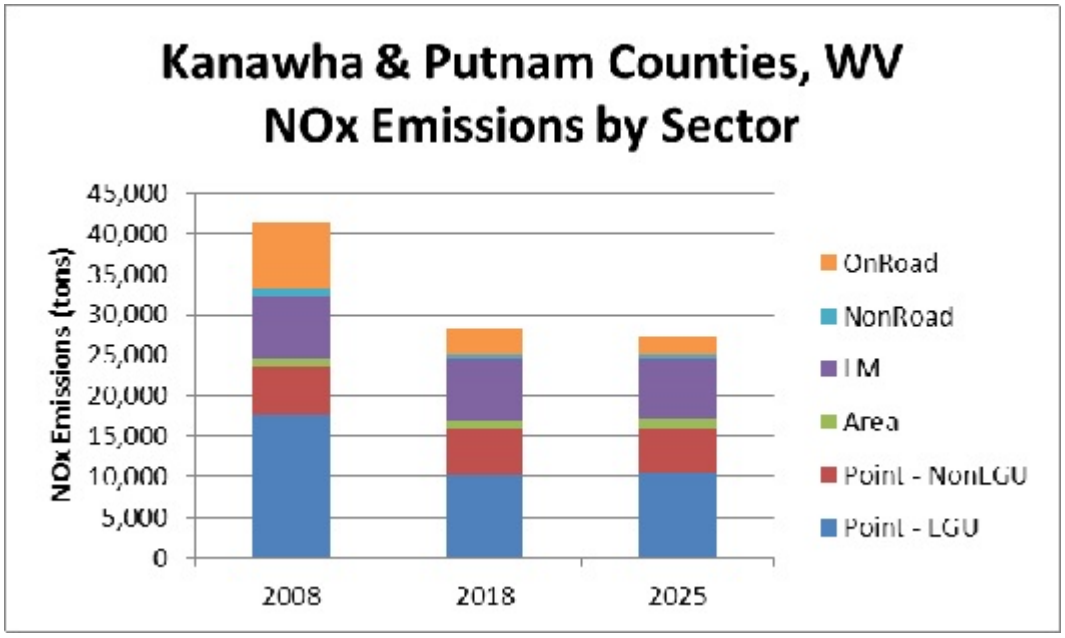


Figure 8: Charleston NAA NO_x Emissions by Sector

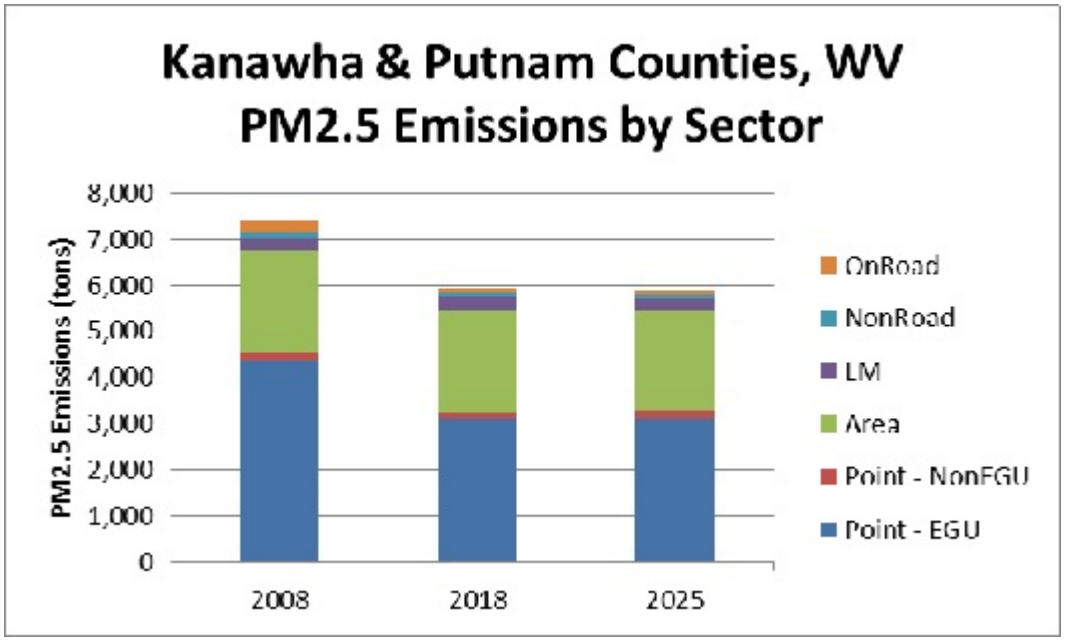


Figure 9: Charleston NAA $PM_{2.5}$ Emissions by Sector

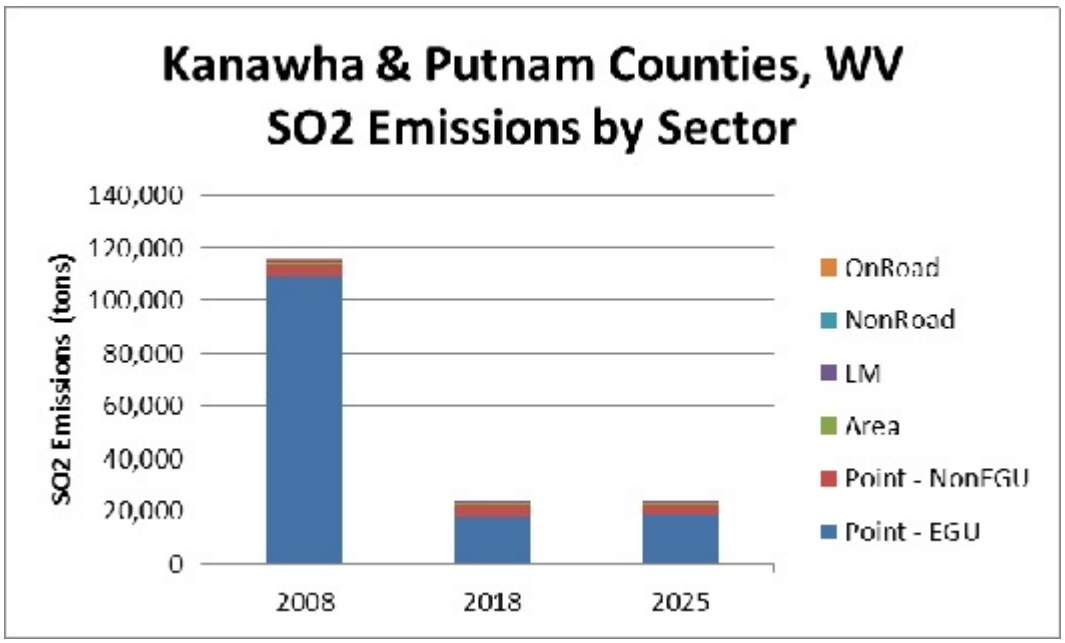


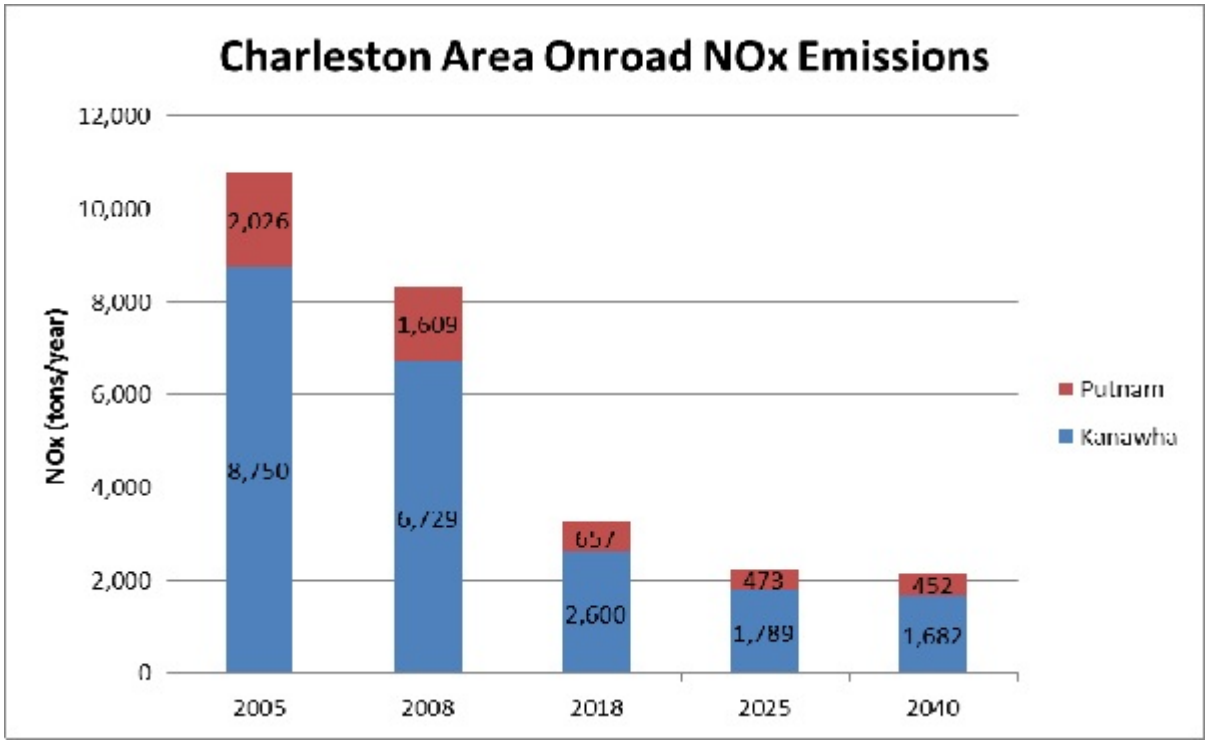
Figure 10: Charleston NAA SO_2 Emissions by Sector

Second, as noted in the Introduction, on October 11, 2011 [76 FR 62640] EPA determined that the Charleston, WV area had attained the 1997 $PM_{2.5}$ NAAQS (Clean Data Determination). This determination was based on complete, quality-assured and certified ambient air monitoring data for the three year period 2007-2009. EPA also determined, in accordance with EPA's $PM_{2.5}$ Implementation Rule of April 25, 2007 [72 FR 20664], that the area had attained the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date of April 5, 2010. Both the 24-hour and annual design values are now comfortably below the respective NAAQS and continue trending down. Given the relatively small contribution of the highway emissions to the total SIP inventory, highway emissions are not likely to contribute significantly to the local $PM_{2.5}$ mass concentrations. Among other factors, this is largely due to the dominance of sulfates in the overall PM mass, coupled with the very low contribution of highway sources to those sulfate totals.

Third, historically there have been no West Virginia SIP requirements for Transportation Control Measures (TCMs). TCMs are strategies that reduce transportation-related air pollution, GHG emissions, and fuel use by reducing vehicle miles traveled and improving roadway operations. Vehicle use can be reduced through less-polluting transportation alternatives, such as public transit, and strategies that decrease the need for vehicle trips, such as telecommuting. TCMs may also focus on making travel more efficient by carefully managing the transportation system. Although no TCMs are contained in the SIP, the Charleston area is subject to Transportation Conformity requirements for the 8-hour ozone standard, with SIP-approved, seasonal budgets for NO_x and Volatile Organic Compounds (VOC). Further, the entire nonattainment area is currently subject to Transportation Conformity for the $PM_{2.5}$ standard. Emissions analysis has been mandatory for annual highway emissions of direct PM and NO_x. However, upon a positive adequacy review or approval of this SIP submittal, no highway emissions analysis will be required for direct NO_x, SO_2 or $PM_{2.5}$ under DAQ's strongly preferred option. Highway analysis of seasonal ozone precursors would continue to be mandatory. And, $PM_{2.5}$ hot-spot analyses would continue to apply for required projects under 40CFR93.116 and 93.123(b) of the Transportation Conformity Rule.

Fourth, RIC and their contractors have extensively researched the local area's historical trends and growth patterns to develop previous LRTP/TIPs and support the development of this SIP. There is no logical reason to expect highway motor vehicle emissions growth that would lead to a $PM_{2.5}$ NAAQS violation. Although it is not required for this maintenance plan, a separate projected emissions analysis was extended to the year 2040 to inform the transportation planners of potential long range conformity issues. The results confirm that there is not a significant concern of growth beyond the 2025 maintenance plan end. Comparing 2040 to 2025 yields less than 1% growth in direct $PM_{2.5}$ and a 5.7% decline in NO_x. There is a 16% increase in SO_2 but that should have no adverse consequence because the highway contribution to total SO_2 in 2025 is only $^{1}/_{10}^{th}$ %. That is, the highway SO_2 increase is a moderate percentage of a very small number. See chart below. DAQ believes this result solidly demonstrates that highway emissions will remain insignificant in the future.

Figure 11: Charleston Area Onroad NO_x Emissions (tpy)



1. Alternative 1: No Motor Vehicle Emissions Budgets (MVEBs)

For all the reasons set forth above, it is WVDAQ's highly preferred approach to find that regional highway emissions of NO_x, $PM_{2.5}$, and SO_2 are insignificant contributors to the nonattainment problem for the Charleston area. The finding will become final if EPA concurs and approves this SIP. Therefore, it is the agency's preferred option NOT to establish MVEBs in the maintenance plan. However, in the event that this proposed finding elicits persuasive and well-supported adverse comment, we are proposing in less preferred alternatives to establish motor vehicle emission budgets (MVEBs) for NO_x and, possibly, $PM_{2.5}$ as well.

2. Alternative 2: Development of NO_x MVEBs

As noted under Table 5., the Transportation Conformity Rule (40CFR93.101) defines *Safety margin* as:

> "the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for reasonable further progress, attainment, or maintenance" (emphasis added).

Thus, in the context of the maintenance plan, there may be safety margins associated with the 2018 interim year and separate safety margins associated with the 2025 end year. These safety margins are calculated by subtracting the 2018 total emissions (for a given pollutant) and the 2025 total emissions (for a given pollutant), respectively, from the 2008 attainment year total emissions (for a given pollutant). We may refer to the results for a given pollutant/precursor as the *2018 safety margin* and the *2025 safety margin*, respectively. Portions of the original safety margins may be reallocated to the MVEBs as long as adequate margins remain to ensure maintenance. It is important to consider that transportation planning organizations typically develop a twenty year Long Range Transportation Plan (LRTP) while the inital air quality maintenance plan only lasts for ten years. Under the conformity rule, the last year of the LRTP must be tested against the MVEBs established for the last year of the maintenance plan. Therefore, future transportation conformity determinations will not only be made for the specific years contained in the maintenance plans but also for horizon years contained in the LRTP, which now may extend to the year 2040.

That is, the future expected highway emissions, including growth, in 2040 will be compared against the 2025 MVEBs. It is also very important to recognize DAQ has little prior experience with MOVES in SIP development and must take prudent steps to ensure positive conformity determinations in the case where our agency's inexperience with, or misapplication of, MOVES leads to significant underestimation of future highway emissions. Therefore, it is DAQ's firm position that liberal amounts of the safety margins should be reallocated to the MVEB's to provide certainty in the transportation planning process. The NO_x emissions estimates from Table 8 are reprinted below for reference (the highway emission estimates from Table 18 are added for comparison):

Table 20: Charleston Nonattainment Area NO_x Emission Inventory Totals, Onroad (Highway) Emissions and Original Safety Margins for 2018 and 2025 (tpy)

	2008 Attainment	2018 Interim	2018 Original Safety Margin	2025 Maintenance	2025 Original Safety Margin
Charleston NAA NO_x Total	**41,387**	**28,331**	**13,056**	**27,291**	**14,097**
Onroad Subtotal	8,337	3,258	na	2,262	na

Thus, the original NO_x 2018 safety margin is 13,056 tons per year and the original NO_x 2025 safety margin is 14,097 tons per year. The DAQ proposes to reallocate one-third ($^1/_3$) of the original safety margins to the NO_x MVEBs. That is 4,352 tpy would be subtracted from the 2018 safety margin and added to the highway emission estimates, yielding a 2018 MVEB of 7,610 tpy. Similarly, 4,699 tpy

would be subtracted from the 2025 safety margin and added to the 2025 highway emission estimates, yielding a 2025 MVEB of 6,961 tpy.

Table 21: Charleston Nonattainment Area NO_x Remaining Safety Margins and Final NO_x MVEBs Under Alternative 2.
After Reallocation of one-third ($^1/_3$) of the Original Safety Margins into the NO_x MVEBs

	2008 Attainment	2018 Original Safety Margin	Amount Reallocated to 2018 MVEB	2018 Remaining Safety Margin and Final MVEB	2025 Original Safety Margin	Amount Reallocated to 2025 MVEB	2025 Remaining Safety Margin and Final MVEB
Charleston NAA NO_x Total	**41,387**	**13,056**	-4,352	**8,704**	**17,097**	-4,699	**9,398**
Alternative 2: Onroad NO_x MVEB	8,338	3,258	+4,352	**7,610**	2,262	+4,699	**6,961**

Notwithstanding the above discussion, the DAQ is also soliciting comment on whether the NO_x MVEBs are necessary at all. Given the large remaining safety margins and declining NO_x emissions throughout the time frame of the maintenance plan, it is likely that a requirement for future conformity determinations would merely fulfill procedural requirements and produce no net environmental benefits. The DAQ invites stakeholders to comment on this matter and provide any supporting evidence for their recommendations.

3. Alternative 3. Development of direct $PM_{2.5}$ MVEBs in Addition to NO_x MVEBs

As noted in Section E.1 preceding the NO_x budgets discussion, verbal guidance from EPA Region 3 staff indicates that the threshold for significance regarding direct $PM_{2.5}$ may be rather low, about 3%. 40CFR93.109(k) says that emissions should be reviewed "in the context of the total SIP inventory" which may include emission percentages, emission trends and, implicitly, the effectiveness of the pollutant in forming PM. This last item is the reason that the benchmark for direct PM is considerably lower than the benchmark for the precursors. The base year 2008 direct PM contribution is 3.62% but falls significantly in later analysis years to 1.89% (2018) and 1.40% (2025). Therefore, DAQ firmly believes that the initial low contribution of direct PM, in concert with its continuing decline warrants an insignificance finding. However, the DAQ is also soliciting comment on the alternative of establishing motor vehicle emission budgets for direct $PM_{2.5}$. The direct PM emissions estimates from Table 5 are reprinted below for reference (the highway emission estimates from Table 18 are added for comparison):

Table 22: Charleston Nonattainment Area $PM_{2.5}$ Emission Inventory Totals, Onroad (Highway) Emissions and Original Safety Margins for 2018 and 2025 (tpy)

	2008 Attainment	2018 Interim	2018 Original Safety Margin	2025 Maintenance	2025 Original Safety Margin
Charleston NAA $PM_{2.5}$ Total	**7,403**	**5,929**	**1,474**	**5,869**	**1,534**
Onroad Subtotal	268	112	na	82	na

Thus, the original $PM_{2.5}$ 2018 safety margin is 1,474 tons per year and the original $PM_{2.5}$ 2025 safety margin is 1,534 tons per year. In alternative 3, the DAQ would reallocate one-fifth ($^1/_5$) of the original safety margins to the $PM_{2.5}$ MVEBs. That is 295 tpy will be subtracted from the 2018 safety margin and added to the highway emission estimates, yielding a 2018 MVEB of 407 tpy. Similarly, 307 tpy will be subtracted from the 2025 safety margin and added to the 2025 highway emission estimates, yielding a 2025 MVEB of 389 tpy.

Table 23: Charleston Nonattainment Area $PM_{2.5}$ Remaining Safety Margins and Final $PM_{2.5}$ MVEBs Under Alternative 3.
After Reallocation of one-fifth ($^1/_5$) of the Original Safety Margins into the $PM_{2.5}$ MVEBs

	2008 Attainment	2018 Original Safety Margin	Amount Reallocated to 2018 MVEB	2018 Remaining $PM_{2.5}$ Safety Margin and Final MVEB	2025 Original Safety Margin	Amount Reallocated to 2025 MVEB	2025 Remaining Safety Margin and Final MVEB
Charleston NAA Direct $PM_{2.5}$ Total	7,403	**1,474**	**-295**	**1,179**	**1,534**	**-307**	**1,227**
Alternative 3. Final $PM_{2.5}$ Onroad MVEBs	268	112	+ 295	**407**	82	+307	**389**

Notwithstanding the above discussions, the DAQ is also expressly soliciting comment on whether any MVEBs for any pollutant or precursors are necessary at all. Given the large remaining safety margins and declining emissions throughout the time frame of the maintenance plan, it is likely that a requirement for future conformity determinations would merely fulfill procedural requirements and produce no net environmental benefits. The DAQ invites stakeholders to comment on this matter and provide any supporting evidence for their preference. It is DAQ's strongly held opinion that no MVEBs are necessary to ensure maintenance.

G. Summary of MVEB Alternatives

Alternative 1: No MVEBs (DAQ's Strongly Preferred Alternative)

Alternative 2: NO_x Highway Budgets Only

2018 NO_x MVEBs = 7,609 tpy and **2025 NO_x MVEB = 6,961 tpy**

Alternative 3: Both NO_x and direct $PM_{2.5}$ Highway Budgets

2018 NO_x MVEB = 7,609 tpy and **2025 NO_x MVEB = 6,961 tpy**; and

2018 $PM_{2.5}$ MVEB = 407 tpy and **2025 $PM_{2.5}$ MVEB = 389 tpy**

V. CONTROL MEASURES AND REGULATIONS

CAA Section107 (d)(3)(E)(ii), 107(d)(3)(iv), and 107(d)(3)(E)(v)

A. Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT)

Section 172(c)(1) of the 1990 Clean Air Act Amendments requires states with nonattainment areas to implement reasonably available control measures (RACM) and reasonably available control technology (RACT).

Section 172(c)(1) of the 1990 Clean Air Act Amendments requires states with nonattainment areas to submit a SIP providing for 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 reasonable available control technology).

EPA's $PM_{2.5}$ Implementation Rule [72FR20586, 29APR2007] interprets this requirement in great detail. Under EPA's approach, RACT is determined as part of the broader RACM analysis and identification of all measures (for stationary, mobile, and Area sources) that are technically and economically feasible, and that would collectively contribute to advancing the attainment date (i.e. by one year or more). States are required to use a combined approach to RACT and RACM, that (1) identifies potential measures that are reasonable, (2) uses modeling to identify the attainment date that is as expeditious as practicable, and (3) selects the appropriate RACT and RACM.

Since the area attained both the 1997 annual and 2006 24-hour $PM_{2.5}$ standards in 2007-2009, well in advance of the April 5, 2010 attainment date for the 1997 standard and the December 14, 2014 attainment date for the 2006 standard, there is no need for additional measures to advance the attainment date, therefore the RACM/RACT requirements do not apply.

Furthermore, EPA states on their website regarding the Clean Data Policy [www.epa.gov/airquality/urbanair/sipstatus/policy_details.html]:

> Under EPA's Clean Data Policy and the regulations that embody it, 40 CFR 51.918 (1997 8-hour ozone) and 51.1004(c) (PM-2.5), an EPA rulemaking determination that an area is attaining the relevant standard suspends the area's obligations to submit an attainment demonstration, reasonable available control measures (RACM), reasonable further progress, contingency measures and other planning requirements related to attainment for as long as the area continues to attain. EPA's statutory interpretation of the Clean Data Policy is described in the "Final Rule to Implement the 8-hour Ozone National Ambient Air Quality Standard—Phase 2" (Phase 2 Final Rule). 70 FR 71612, 71644-46 (Nov. 29, 2005) (ozone); See also 72 FR 20585, 20665 (Apr. 25, 2007) (PM-2.5). EPA believes that the legal bases set forth in detail in our Phase 2 Final rule, our May 10, 1995 memorandum from John S. Seitz, entitled "Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard," and our December 14, 2004 memorandum from Stephen D. Page entitled "Clean Data Policy for the Fine Particle National Ambient Air Quality Standards" are equally pertinent to all NAAQS. EPA has codified the Clean Data Policy for 1997 8-hour ozone and PM-2.5, and has also applied it in individual rulemakings for 1-hour ozone and PM-10.

> Under the Clean Data Policy, EPA may issue a determination of attainment (known informally as a Clean Data Determination) after notice and comment rulemaking determining that a specific area is attaining the relevant standard. For such areas the requirement to submit to EPA those SIP elements related to attaining the NAAQS is suspended for so long as the area continues to attain the standard. These planning elements include reasonable further progress (RFP) requirements, attainment demonstrations, RACM, contingency measures, and other state planning requirements related to attainment of the NAAQS. The determination of attainment is not equivalent to a redesignation, and the state must still meet the statutory requirements for redesignation in order to be redesignated to attainment. A determination of attainment for purposes of the Clean Data Policy/regulations is also not linked to any particular attainment deadline, and is not necessarily equivalent to a determination that an area has attained the standard by its applicable attainment deadline, e.g., under section 181(b).

On October 11, 2011, in accordance with Section 179(c)(1) of the CAA, EPA determined that the Charleston, WV $PM_{2.5}$ nonattainment area had attained the 1997 annual $PM_{2.5}$ NAAQS, this determination [76 FR 62640] was based upon three years of complete, quality assured, quality-controlled data for the 2007-2009. EPA further determined that, in accordance with the $PM_{2.5}$ Implementation Rule of April 5, 2007 [72FR20664], the Charleston area had attained the 1997 annual $PM_{2.5}$ NAAQS by the applicable attainment date of April 5, 2010. Complete quality-assured $PM_{2.5}$ ambient air quality data for the most recent three (3) years, 2008 through 2010,and preliminary data for 2009 through 2011, demonstrate that the air quality continues to meet the NAAQS for annual $PM_{2.5}$ in this nonattainment area. Therefore, RACM, including RACT, no longer applies with respect to the 1997 $PM_{2.5}$ standard.

On November 18, 2011 [76FR71450], EPA determined that the Charleston, WV nonattainment area has clean data for the 2006 $PM_{2.5}$ NAAQS. The determination was based upon quality assured, quality controlled, and certified ambient air monitoring data showing that the area has monitored attainment of the 24-hour 2006 $PM_{2.5}$ NAAQS based on the 2007-2009 data. Complete quality-assured $PM_{2.5}$ ambient air quality data for the most recent three (3) years, 2008-2010, and preliminary data for 2009-2011, demonstrate that the air quality continues to meet the NAAQS for 24-hour $PM_{2.5}$ in this nonattainment area. Therefore, RACM, including RACT, no longer applies with respect to the 2006 $PM_{2.5}$ standard.

B. Inventory of Actual Emissions

Section 172(c)(3) requires states to submit a comprehensive inventory of actual emissions in the area, including the requirement for periodic revisions as determined necessary. 40 CFR 51.1008 requires such inventory to be submitted within three years of designation and requires a baseline emission inventory for calendar year 2002 or other suitable year to be used for attainment planning.

In accordance with the Consolidated Emissions Reporting Rule (CERR), West Virginia 2002 and 2005 statewide comprehensive emissions inventories were submitted to EPA's CDX site on April 29, 2005 and June 1, 2007, respectively. The West Virginia 2008 comprehensive emissions inventory was submitted to the CDX on May 30, 2010 consistent with the requirements of the Air Emissions Reporting Requirements (AERR). We are hereby resubmitting the 2005, and 2008 comprehensive inventories for the Charleston nonattainment area.

West Virginia will continue to provide updates to future inventories in accordance with EPA's AERR rule. As discussed in Section III.F, West Virginia DAQ submits, and commits to submit, emission inventories every three years.

C. Evidence that control measures required in past $PM_{2.5}$ SIP revisions have been fully implemented.

1. NO_x SIP Call, CAIR and CSAPR

The EPA NO_x SIP Call required 22 states to pass rules that would result in significant emission reductions from large EGUs, industrial boilers, and cement kilns in the eastern United States. West Virginia passed this rule in 2002. NO_x SIP Call requirements are incorporated into permits along with monitoring, recordkeeping, and reporting necessary to ensure ongoing compliance. West Virginia DAQ also has an active enforcement program to address violations discovered by field office staff. Compliance is tracked through the Clean Air Markets data monitoring program. In West Virginia, this rule accounted for a reduction from 2003 levels of approximately 57 percent of NO_x emissions by 2008 from sources subject to the rule. The other 21 states also adopted these rules.

On May 12, 2005, the EPA promulgated the CAIR. Beginning in 2009, EPA's CAIR rule required EGUs in 28 eastern states and the District of Columbia to significantly reduce emissions of NO_x and SO_2. CAIR replaced the NO_x SIP Call for EGUs. National NO_x emissions were expected to be cut from 4.5 million tons in 2004, to a cap of 1.5 million tons by 2009, and 1.3 million tons in 2018 in 28 states. States were required to submit a CAIR SIP as part of this effort. West Virginia submitted an initial CAIR SIP on June 1, 2006. Subsequently, WV submitted an abbreviated CAIR SIP on June 8, 2007, which requested authority to allocate CAIR allowances. Final revisions to the CAIR SIP were submitted on April 22, 2008. The revised CAIR SIP was approved in a direct final action on August 2, 2009 (74FR38536).

On July 6, 2010, EPA proposed a replacement to the CAIR program, the Transport Rule [75 FR 45210]. On July 6, 2011, EPA finalized the Transport Rule, now commonly referred to as the Cross-State Air Pollution Rule (CSAPR) [76FR48208, 08AUG2011] in time for reductions to begin in 2012. As finalized, the CSAPR would have preserved the initial reductions achieved under CAIR and provided more reductions in NO_x and SO_2 emissions in 2012 and 2014, ahead of the 2015 CAIR Phase 2. On August 21, 2012 the US Court of Appeals for the DC Circuit vacated CAIR, and indefinitely reinstated CAIR.

EPA stated on their Cross-State Air Pollution Rule homepage: "By 2014, power plants in states common to both the Cross-State Air Pollution Rule and CAIR will achieve annual SO_2 emissions around 1.8 million tons lower and annual NO_x emissions around 76,000 tons lower than what would have been achieved at that time under CAIR." (www.epa.gov/airtransport/basic.html)

Controls for EGUs under the NO_x SIP Call formally commenced May 31, 2004. Emissions covered by this program have been generally trending downward since 1998 with larger reductions occurring in 2002 and 2003. Data taken from the EPA Clean Air Markets web site, quantify the gradual NO_x reductions that have occurred in West Virginia as a result of Title IV of the 1990 CAA Amendments and the beginning of the NO_x SIP Call Rule. West Virginia

developed the NO_x Budget Trading Program rules in 45CSR 1 and 26 in response to the SIP Call. 45CSR1 regulated EGUs and 45CSR26 regulated certain non-EGUs under a cap and trade program based on an 77 percent reduction of NO_x emissions from EGUs and a 60 percent reduction of NO_x emissions from non-EGUs, compared to historical levels. This cap was in place through 2008, at which time the CAIR program superseded it as discussed above. Section III above discussed the reductions West Virginia has seen as a result of CAIR.

On April 21, 2004, EPA published Phase II of the NO_x SIP Call that established a budget for large (greater than 1 ton per day emissions) stationary internal combustion engines. 45CSR1 addresses stationary internal combustion engines, all used in natural gas pipeline transmission. EPA approved this revision to the SIP on November 27, 2006. An 82 percent NO_x reduction from 1995 levels was anticipated. Approval of the compliance plans occurred by August 4, 2006, and March 1, 2007 and the compliance demonstration began May 1, 2007.

2. Tier II Emission Standards for Vehicles and Gasoline Sulfur Standards
   [65FR6698, 10FEB2000]

In February 2000, EPA published a federal rule to significantly reduce emissions from cars and light trucks, including sport utility vehicles (SUVs). Under this proposal, automakers will be required to sell cleaner cars, and refineries will be required to make cleaner, lower sulfur gasoline. This rule applies nationwide. The federal rules phased in between 2004 and 2009. EPA estimated that NO_x emission reductions will be approximately 77 percent for passenger cars, 86 percent for smaller SUVs, light trucks, and minivans, and 65 to 95 percent reductions for larger SUVs, vans, and heavier trucks. The sulfur content of gasoline is estimated to be reduced by up to 90 percent. VOC emission reductions will be approximately 12 percent for passenger cars, 18 percent for smaller SUVs, light trucks, and minivans, and 15 percent for larger SUVs, vans, and heavier trucks.

3. Heavy-Duty Diesel Engines
   [65FR59896, 06OCT2000]

In October 2000, EPA published a final rule for Highway Heavy Duty Engines, a program which includes low-sulfur diesel fuel standards, which were phased in from 2004 through 2007. This rule applies to heavy-duty gasoline and diesel trucks and buses. This rule resulted in a 40 percent reduction in NO_x from diesel trucks and buses, a large sector of the mobile sources NO_x inventory. It also estimated the level of sulfur in highway diesel fuel would be reduced by 97 percent by mid-2006.

4. Clean Air Non-road Diesel Rule
[69FR38958, 29JUN2004]

In June 2004, EPA published the Clean Air Non-road Diesel Rule. This rule applies to diesel engines used in industries such as construction, agriculture, and mining. It also contains a cleaner fuel standard similar to the highway diesel program. The new standards will cut emissions from non-road diesel engines by more than 90 percent. Non-road diesel equipment, as described in this rule, currently accounts for 47 percent of diesel particulate matter (PM) and 25 percent of NO_x from mobile sources nationwide. Sulfur levels will be reduced in non-road diesel fuel by 99 percent from 2004 levels, from approximately 3,000 parts per million (ppm) to 15 ppm in 2009. New engine standards took effect, based on engine horsepower, starting in 2008. Together, these rules will substantially reduce local and regional sources of $PM_{2.5}$ precursors.

D. Assurance that existing control measures will remain in effect

West Virginia commits to maintaining the aforementioned control measures after redesignation. West Virginia hereby commits that any changes to its rules or emission limits applicable to $PM_{2.5}$, SO_2, and NO_x as required for maintenance of the annual $PM_{2.5}$ standard in the Charleston area, will be submitted to EPA for approval as a SIP revision.

West Virginia, through the Division of Environmental Protection, DAQ, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of $PM_{2.5}$ precursors in the Charleston Area.

VI. SUPPLEMENTAL MODELING ANALYSES FOR THE 1997 $PM_{2.5}$ NAAQS

Although EPA's Redesignation Guidance does not require modeling nonattainment areas seeking redesignation, extensive modeling has been performed covering the Charleston area to determine the effect of national emission control strategies on $PM_{2.5}$ concentrations. These modeling analyses determined that the Charleston area is significantly impacted by regional transport of $PM_{2.5}$ and its precursors, and that regional SO_2 and NO_x reductions are an effective way to attain the annual standards for $PM_{2.5}$ in this area. Future year modeled annual $PM_{2.5}$ concentrations are expected to be reduced by 11% to 32% from baseline design values. Examples of these modeling analyses are described below.

A. EPA Modeling for the Cross State Air Pollution Rule (Final Transport Rule)

EPA performed modeling to support the emission reductions associated with the Final Transport Rule or the Cross State Air Pollution Rule (CSAPR), as it is currently called. EPA used the Comprehensive Air Quality Model with Extension (CAMx) version 5.3 applied to the 2005 meteorology as processed by the Mesoscale Model (MM5), Version 3.7.4. Emissions input into the CAMx included SO_2, NO_x, VOC, NH_3 and direct $PM_{2.5}$ for 2005. The modeling was based on the annual fine particle design values calculated from 2003 through 2005, 2004 through 2006, and 2005 through 2007. Future year modeling was conducted, and the future year design values for 2012 and 2014 were evaluated for attainment of the annual NAAQS for $PM_{2.5}$ of 15 $\mu g/m^3$, as shown in Table 24. The Kanawha County monitors (54-039-0010, 54-039-0011 and 54-039-1005) represent the Charleston area.

As indicated in the Air Quality Modeling Technical Support Document (TSD) for the CSAPR, air quality modeling was performed for several emissions cases: a 2005 base year, a 2012 "no CAIR" base case, a 2014 "no CAIR" base case, and the 2014 remedy case.

Modeling results for the Charleston area (Kanawha County monitor, 54-039-1005) show a 1.87 $\mu g/m^3$ (11.3%) decrease in the average $PM_{2.5}$ concentration for 2012 and a 2.51 $\mu g/m^3$ (15.2%) decrease in the average concentration for 2014, without accounting for CAIR or reductions required by the Transport Rule or CSAPR. A reduction of 5.22 $\mu g/m^3$ (31.6%) from the 2003-2007 baseline is expected for 2014 with the implementation of the CSAPR. It should also be noted that the base year design value used by EPA in their modeling was taken from 2003 through 2007 and is higher than the current 2009 through 2011 design value of 12.5 $\mu g/m^3$ in the area. Furthermore, the monitored design values for 2008-2010 and 2009-2011 of 13.2 and 12.5 $\mu g/m^3$, respectively, are less than the modeled base case design vales for 2012 and 2014. Figure 2 (in Section II) show the downward trend of the design values from 1999 through 2010 for the $PM_{2.5}$ monitors in West Virginia.

Table 24: CSAPR Annual $PM_{2.5}$ Design Values (µg/m3)									
Site ID	**County**	**2003-2007 Average Ambient Value**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
54-003-0003	Berkeley	15.93	16.19	14.09	14.32	13.70	13.92	11.81	11.99
54-009-0005	Brooke	16.52	16.80	14.33	14.58	13.84	14.09	11.34	11.55
54-009-0011	Brooke	16.04	16.37	13.87	14.15	13.39	13.66	10.89	11.13
54-011-0006	Cabell	16.30	16.57	14.71	14.94	14.05	14.28	11.57	11.75
54-029-1004	Hancock	15.76	16.64	13.73	14.51	13.28	14.03	10.81	11.44
54-033-0003	Harrison	13.99	14.19	13.17	13.36	12.71	12.90	9.36	9.49
54-039-0010	Kanawha	15.15	15.38	13.40	13.60	12.78	12.97	10.13	10.28
54-039-0011	Kanawha	13.17	13.17	11.67	11.67	11.13	11.13	8.67	8.67
54-039-1005	Kanawha	16.52	16.59	14.65	14.71	14.01	14.06	11.30	11.35
54-049-0006	Marion	15.03	15.25	14.22	14.43	13.76	13.95	10.16	10.30
54-051-1002	Marshall	15.19	15.33	13.25	13.38	12.75	12.87	10.07	10.17
54-061-0003	Monongalia	14.35	14.47	12.89	13.01	12.41	12.53	9.28	9.40
54-069-0010	Ohio	14.58	14.58	12.53	12.53	12.05	12.05	9.51	9.51
54-081-0002	Raleigh	12.90	13.03	11.22	11.33	10.70	10.80	8.39	8.47
54-107-1002	Wood	15.40	15.44	13.74	13.77	13.16	13.20	10.84	10.87

Source: Air Quality Modeling Final Technical Support Document for the Final Cross-State Air Pollution Rule , pages B-61 - B-62. (www.epa.gov/airtransport/techinfo.html)

B. EPA Modeling for Proposed Transport Rule 2010

EPA performed modeling to support the emission reductions associated with the Proposed Transport Rule. EPA used the Comprehensive Air Quality Model with Extension (CAMx Version 5), applied to the 2005 meteorology as processed by the Mesoscale Model (MM5), Version 3.7.4. Emissions input into the CAMx included SO_2, NO_x, VOC, NH_3 and direct $PM_{2.5}$ for 2005. The modeling was based on the annual fine particle design values calculated from 2003 through 2005, 2004 through 2006, and 2005 through 2007. Future year modeling was conducted, and the future year design values for 2012 and 2014 were evaluated for attainment of the annual NAAQS for $PM_{2.5}$ of 15 $\mu g/m^3$, as shown in Table 25. The Kanawha County monitors (54-039-0010, 54-039-0011 and 54-039-1005) represent the Charleston area.

Table 25: Proposed Transport Rule Modeling Results from EPA - 2010

Monitor ID	County	Design Value 2003-2007 ($\mu g/m^3$)	Future Design Value 2012 Base ($\mu g/m^3$)	Future Design Value 2014 Base ($\mu g/m^3$)	Future Design Value 2014 Remedy ($\mu g/m^3$)
54-003-0003	Berkeley	15.93	14.95	14.64	12.44
54-009-0005	Brooke	16.52	14.95	14.51	12.02
54-009-0011	Brooke	16.04	14.49	14.05	11.56
54-011-0006	Cabell	16.30	15.25	14.65	12.09
54-029-1004	Hancock	15.76	14.34	13.93	11.48
54-033-0003	Harrison	13.99	13.82	13.30	9.94
54-039-0010	Kanawha	15.15	14.01	13.45	10.77
54-039-0011	Kanawha	13.17	12.23	11.74	9.24
54-039-1005	Kanawha	16.52	15.28	14.69	11.97
54-049-0006	Marion	15.03	14.96	14.41	10.79
54-051-1002	Marshall	15.19	13.96	13.44	10.74
54-061-1003	Monongalia	14.35	13.72	13.14	10.01
54-069-0010	Ohio	14.58	13.18	12.72	10.15
54-081-0002	Raleigh	12.90	11.88	11.40	9.01
54-107-1002	Wood	15.40	14.31	13.77	11.40

Source: Technical Support Document for the Proposed Transport Rule, pages B-52 - B-53. (www.epa.gov/airquality/transport/pdfs/TR_AQModeling_TSD.pdf)

EPA stated in the preamble to the proposed Transport Rule that the "baseline analysis takes into account emissions reductions associated with the implementation of all federal rules promulgated by December 2008 and assumes that CAIR is not in effect." [75FR 45233, 02AUG2010]

Modeling results for the Charleston area (Kanawha County monitor, 54-039-1005) show a 1.24 $\mu g/m^3$ (7.5%) decrease in the $PM_{2.5}$ concentration for 2012 and a 1.83% $\mu g/m^3$ (11.1%) decrease in the concentration for 2014, without accounting for CAIR or reductions required by the Transport Rule. A reduction of 4.55 $\mu g/m^3$ (27.5%) from the 2003-2007 baseline is expected for 2014 with the implementation of the Transport Rule. It should also be noted that the base year design value used by EPA in their modeling was taken from 2003 through 2007 and is higher than the current 2009 through 2011 design value of 12.5 $\mu g/m^3$ in the area. Furthermore, the monitored design values for 2007-2009, 2008-2010 and 2009-2011 of 14.4, 13.2 and 12.5 $\mu g/m^3$, respectively, are less than the modeled base case design vales for 2012 and 2014. Figure 2 (in Section II) shows the downward trend of the design values from 1999 through 2010 for the $PM_{2.5}$ monitors in West Virginia.

C. VISTAS/ASIP Emissions and Air Quality Modeling to Support $PM_{2.5}$ and 8-hour Ozone State Implementation Plans

VISTAS/ASIP conducted modeling to determine the impact of CAIR and other control programs in the southeast, including West Virginia. The VISTAS/ASIP modeling used Version 4.51 of the Community Multi-scale Air Quality (CMAQ) modeling system with enhanced secondary organic aerosol (SOA) module (SOAmods) applied to the year 2002 meteorology, as processed by MM5. Emissions input into CMAQ included SO_2, NO_x, VOC, NH_3 and direct $PM_{2.5}$ for 2002. The modeling was based on 2000 through 2004 design values. Future year modeling for 2009, 2012 and 2018 was conducted and the future year design values were determined with the emission reductions associated with CAIR, as shown in Table 26. The Transport Rule is expected to provide reductions above and beyond CAIR. The Kanawha County monitors (54-039-0010, 54-039-0011, and 54-039-1005) represent the Charleston area.

The VISTAS/ASIP modeling results for the Charleston area (Kanawha County monitor, 54-039-1005) predicted a 2.4 $\mu g/m^3$ (14.0%) decrease in the projected $PM_{2.5}$ concentration for 2009 from the 2002 design value. As shown in Table 1, the actual monitored design value for 2007-2009 was 14.4 $\mu g/m^3$, a 2.7 $\mu g/m^3$ (15.8%) improvement, slightly more than predicted. The modeling results show a continued improvement in the area, with a $PM_{2.5}$ concentration of 13.2 $\mu g/m^3$ by 2018, a 22.8% reduction from the 2002 design value. The current 2009-2011 design value for the area is 12.5 $\mu g/m^3$.

Table 26: VISTAS/ASIP 2009, 2012 and 2018 Modeling Results (with CAIR)					
Monitor ID	**County**	**2002 Annual DVC**	**Annual DVF**		
			2009	**2012**	**2018**
54-003-0003	Berkeley	16.2	13.5	12.9	12.3
54-009-0005	Brooke	16.7	13.6	13.3	12.6
54-011-0006	Cabell	16.5	14.4	13.7	13.3
54-029-0011	Hancock	16.0	13.0	12.6	11.9
54-026-1004	Hancock	17.3	14.0	13.7	13.0
54-033-0003	Harrison	14.0	11.6	10.7	10.4
54-039-0010	Kanawha	15.4	13.1	12.2	11.7
54-039-1005	Kanawha	17.1	14.7	13.7	13.2
54-049-0006	Marion	15.3	12.9	12.0	11.6
54-051-1002	Marshall	15.6	13.2	12.7	12.1
54-055-0002	Mercer	12.7	10.6	9.7	9.1
54-061-0003	Monongalia	14.8	12.3	11.5	11.0
54-069-0008	Ohio	15.1	12.6	12.1	11.5
54-081-0002	Raleigh	13.1	11.0	10.1	9.5
54-089-0001	Summers	10.1	8.3	7.6	7.1
54-107-1002	Wood	16.1	13.8	13.4	12.6

Source: Technical Support Document for the Association for Southeastern Integrated Planning (ASIP) Emissions and Air Quality Modeling to Support $PM_{2.5}$ and 8-Hour Ozone State Implementation Plans, March 24, 2008.

D. EPA's CAIR Modeling

One air quality modeling exercise that contains results for West Virginia's nonattainment areas is the EPA's modeling for the CAIR. The Technical Support Document for the CAIR, March 2005, provides modeling results with and without the implementation of the CAIR. Differences between the EPA's modeling and VISTAS modeling are:

- The meteorology was for 2001,
- The DVB was the weighted design values for the 1999-2003 period, and
- The modeling results were for 2010.

The DVF was calculated using the CAIR SMAT tool. The CAIR modeling results are listed in Table 27.

Table 27. EPA CAIR Modeling Results

State	County	Average 99-03	2010 Base	2010 CAIR	2015 Base	2015 CAIR
WV	Berkeley	16.18	15.69	13.43	15.32	12.73
WV	Brooke	16.96	16.63	14.42	16.51	14.05
WV	Cabell	17.22	17.03	15.08	16.86	14.64
WV	Hancock	17.40	17.06	14.89	16.97	14.54
WV	Harrison	14.40	14.15	11.90	13.82	11.31
WV	Kanawha	17.75	17.56	15.27	17.17	14.66
WV	Marion	15.58	15.32	12.90	14.98	12.23
WV	Marshall	16.07	15.81	13.46	15.52	12.87
WV	Mercer	12.97	12.52	10.82	12.14	10.16
WV	Monongalia	14.96	14.77	12.31	14.37	11.40
WV	Ohio	15.37	15.14	12.81	14.84	12.22
WV	Raleigh	13.54	13.19	11.33	12.80	10.66
WV	Summers	10.46	10.21	8.63	9.89	8.07
WV	Wood	16.88	16.66	14.14	16.69	13.88

The EPA's results were for the highest monitor in a county where more than one monitor is located. The EPA's modeling results predicted that the Charleston (Kanawha and Putnam Counties) nonattainment area would be above the annual $PM_{2.5}$ standard in 2010, but below the standard by 2015. Although 2010 was one year later than the required attainment year for the area, EPA's predicted 2010 CAIR DVF of 15.27 $\mu g/m^3$ was 2.07 $\mu g/m^3$ greater than the DAQ monitored 3 year design value for 2010 of 13.2 $\mu g/m^3$. The modeling still supports that the area will continue to attain the annual $PM_{2.5}$ standard through 2015 with a projected design value of 14.66 $\mu g/m^3$, which is 2.16 $\mu g/m^3$ (17.3%) higher than the current 2009-2011 design value for the area of 12.5 $\mu g/m^3$.

VII. SUPPLEMENTAL MODELING ANALYSES FOR THE 2006 24-HOUR $PM_{2.5}$ NAAQS

Although EPA's Redesignation Guidance does not require modeling nonattainment areas seeking redesignation, extensive modeling has been performed covering the Charleston area to determine the effect of national emission control strategies on $PM_{2.5}$ concentrations. These modeling analyses determined that the Charleston area is significantly impacted by regional transport of $PM_{2.5}$ and its precursors, and that regional SO_2 and NO_x reductions are an effective way to attain the annual standards for $PM_{2.5}$ in this area. Future year modeled 24-hour $PM_{2.5}$ concentrations are expected to be reduced by 7% to 39% from baseline design values. Examples of these modeling analyses are described below.

A. EPA Modeling for the Cross State Air Pollution Rule (Final Transport Rule)

EPA performed modeling to support the emission reductions associated with the Final Transport Rule or the Cross State Air Pollution Rule (CSAPR), as it is currently called. EPA used the Comprehensive Air Quality Model with Extension (CAMx) version 5.3 applied to the 2005 meteorology as processed by the Mesoscale Model (MM5), Version 3.7.4. Emissions input into the CAMx included SO_2, NO_x, VOC, NH_3 and direct $PM_{2.5}$ for 2005. The modeling was based on the annual fine particle design values calculated from 2003 through 2005, 2004 through 2006, and 2005 through 2007. Future year modeling was conducted, and the future year design values for 2012 and 2014 were evaluated for attainment of the 24-hour NAAQS for $PM_{2.5}$ of 35 $\mu g/m^3$, as shown in Table 28. The Kanawha County monitors (54-039-0010, 54-039-0011 and 54-139-1005) represent the Charleston area.

As indicated in the Air Quality Modeling Technical Support Document (TSD) for the CSAPR, air quality modeling was performed for several emissions cases: a 2003-2007 base year, a 2012 "no CAIR" base case, a 2014 "no CAIR" base case, and the 2014 remedy case.

Modeling results for the Charleston area (Kanawha County monitor, 54-039-1005) show a 4.9 $\mu g/m^3$ (13.2%) decrease in the average 24-hour $PM_{2.5}$ concentration for 2012 and a 6.4 $\mu g/m^3$ (17.3%) decrease in the average concentration for 2014, without accounting for CAIR or reductions required by the Transport Rule or CSAPR. A reduction of 14.5 $\mu g/m^3$ (39.3%) from the 2003-2007 baseline is expected for 2014 with the implementation of the CSAPR. It should also be noted that the base year design value used by EPA in their modeling was taken from 2003 through 2007 and is higher than the current 2009 through 2011 design value of 26 $\mu g/m^3$ in the area. Furthermore, the monitored design values for 2008-2010 and 2009-2011 of 28 and 26 $\mu g/m^3$, respectively, are less than the modeled base case design vales for 2012 and 2014. Figures 2 and 3 (in Section II) show the downward trend of the design values from 1999 through 2010 for the $PM_{2.5}$ monitors in West Virginia and Ohio.

Table 28: CSAPR 24-Hour $PM_{2,5}$ Design Values (µg/m3)									
Site ID	**County**	**2003-2007 Average Ambient Value**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
54-003-0003	Berkeley	34.5	35.8	30.6	31.1	29.8	30.3	25.9	27.2
54-009-0005	Brooke	39.4	41.5	31.9	33.4	30.4	31.6	24.5	25.5
54-009-0011	Brooke	43.9	44.9	37.5	38.3	36.1	37.0	28.3	29.1
54-011-0006	Cabell	35.1	36.6	30.9	32.2	29.3	30.7	21.0	22.2
54-029-1004	Hancock	40.6	41.2	32.5	32.7	30.7	31.1	22.5	23.3
54-033-0003	Harrison	33.5	34.6	31.3	32.2	30.1	31.0	18.5	18.8
54-039-0010	Kanawha	34.7	35.5	29.8	30.4	28.4	29.0	19.9	20.9
54-039-0011	Kanawha	33.1	33.1	28.4	28.4	27.1	27.1	19.8	19.8
54-039-1005	Kanawha	36.9	37.7	32.0	32.6	30.5	31.0	22.4	23.2
54-049-0006	Marion	33.6	33.7	30.9	31.0	29.7	29.7	18.4	18.5
54-051-1002	Marshall	33.9	34.8	28.1	28.3	27.0	27.2	19.3	19.6
54-061-0003	Monongalia	35.6	36.2	30.3	31.0	28.3	28.9	17.2	17.9
54-069-0010	Ohio	32.0	32.0	26.3	26.3	25.1	25.1	18.1	18.1
54-081-0002	Raleigh	30.6	31.3	25.7	26.3	24.5	25.0	17.2	17.4
54-089-0001	Summers	31.2	31.2	26.4	26.4	25.1	25.1	17.4	17.4
54-107-1002	Wood	35.4	36.7	30.1	31.2	27.5	28.5	20.2	21.2

Source: Air Quality Modeling Final Technical Support Document for the Final Cross-State Air Pollution Rule , pages B-90 - B-91. (www.epa.gov/airtransport/techinfo.html)

B. EPA Modeling for Proposed Transport Rule 2010

EPA performed modeling to support the emission reductions associated with the Proposed Transport Rule. EPA used the Comprehensive Air Quality Model with Extension (CAMx Version 5), applied to the 2005 meteorology as processed by the Mesoscale Model (MM5), Version 3.7.4. Emissions input into the CAMx included SO_2, NO_x, VOC, NH_3 and direct $PM_{2.5}$ for 2005. The modeling was based on the annual fine particle design values calculated from 2003 through 2005, 2004 through 2006, and 2005 through 2007. Future year modeling was conducted, and the future year design values for 2012 and 2014 were evaluated for attainment of the 24-hour NAAQS for $PM_{2.5}$ of 35 $\mu g/m^3$, as shown in Table 29. The Kanawha County monitors (54-039-0010, 54-039-0011 and 54-039-1005) represent the Charleston area.

EPA stated in the preamble to the proposed Transport Rule that the "baseline analysis takes into account emissions reductions associated with the implementation of all federal rules promulgated by December 2008 and assumes that CAIR is not in effect." [75FR 45233, 02AUG2010]

Modeling results for the Charleston area (Kanawha County monitor, 54-039-1005) show a 2.6 $\mu g/m^3$ (7.0%) decrease in the $PM_{2.5}$ concentration for 2012 and a 3.6 $\mu g/m^3$ (10.6%) decrease in the concentration for 2014, without accounting for CAIR or reductions required by the Transport Rule. A reduction of 12.4 $\mu g/m^3$ (33.6%) from the 2003-2007 baseline is expected for 2014 with the implementation of the Transport Rule. It should also be noted that the base year design value used by EPA in their modeling was taken from 2003 through 2007 and is higher than the current 2009 through 2011 design value of 26 $\mu g/m^3$ in the area. Furthermore, the monitored design values for 2007-2009, 2008-2010 and 2009-2011 of 32, 28 and 26 $\mu g/m^3$, respectively, are less than the modeled base case design vales for 2012 and 2014. Figures 2 and 3 (in Section II) show the downward trend of the design values from 1999 through 2010 for the $PM_{2.5}$ monitors in West Virginia and Ohio.

Table 29: Proposed Transport Rule 24-Hour $PM_{2.5}$ Design Values (µg/m3)									
Site ID	**County**	**2003-2007 Average Ambient Value**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
54-003-0003	Berkeley	34.5	35.8	32.0	32.7	31.6	32.2	29.3	30.0
54-009-0005	Brooke	39.4	41.5	33.9	36.1	33.0	35.2	28.9	30.6
54-009-0011	Brooke	43.9	44.9	39.9	40.8	39.2	40.1	36.4	37.1
54-011-0006	Cabell	35.1	36.6	32.1	33.6	30.8	32.2	23.3	24.6
54-029-1004	Hancock	40.6	41.2	34.3	34.6	32.7	33.2	26.0	26.6
54-033-0003	Harrison	33.5	34.6	33.0	34.0	31.3	32.3	20.2	20.5
54-039-0010	Kanawha	34.7	35.5	32.2	32.9	30.9	31.6	22.2	22.9
54-039-0011	Kanawha	33.1	33.1	30.8	30.8	29.6	29.6	21.5	21.5
54-039-1005	Kanawha	36.9	37.7	34.3	35.1	33.0	33.7	24.5	25.5
54-049-0006	Marion	33.6	33.7	34.3	34.4	32.8	32.8	20.1	20.2
54-051-1002	Marshall	33.9	34.8	30.0	30.9	28.7	29.6	22.9	23.9
54-061-0003	Monongalia	35.6	36.2	33.7	34.3	31.2	31.7	20.4	21.2
54-069-0010	Ohio	32.0	32.0	27.9	27.9	26.9	26.9	24.0	24.0
54-081-0002	Raleigh	30.6	31.3	27.8	28.3	26.7	27.2	19.6	19.9
54-089-0001	Summers	31.2	31.2	27.9	27.9	26.6	26.6	19.2	19.2
54-107-1002	Wood	35.4	36.7	32.7	33.9	31.1	32.2	23.0	23.4

Source: Technical Support Document for the Proposed Transport Rule, page B-78. (www.epa.gov/airquality/transport/pdfs/TR_AQModeling_TSD.pdf)

VIII. CONTINGENCY MEASURES

CAA Section 107(d)(3)(E)(v)

A. Maintenance Plan Review

West Virginia hereby commits to review its maintenance plan eight years after redesignation, as required by Section 175(A) of the CAA.

B. Corrective Actions

West Virginia hereby commits to adopt and expeditiously implement necessary corrective actions in the following circumstances:

1. Warning Level Response

   a. Annual Standard

   A warning level response shall be prompted whenever the $PM_{2.5}$ average of the weighted annual mean of 15.5 $\mu g/m^3$ occurs in a single calendar year within the maintenance area. A warning level response will consist of a study to determine whether the $PM_{2.5}$ value indicates a trend toward higher $PM_{2.5}$ values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation as well as economic and social considerations. Implementation of necessary controls in response to a warning level response trigger will take place as expeditiously as possible, but in no event later than 12 months from the conclusion of the most recent calendar year.

   b. 24-hour Standard

   A warning level response shall be prompted whenever the 98^{th} percentile 24-hour $PM_{2.5}$ concentration of 35.5 $\mu g/m^3$ occurs in a single calendar year within the maintenance area. A warning level response will consist of a study to determine whether the $PM_{2.5}$ value indicates a trend toward higher $PM_{2.5}$ values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation as well as economic and social considerations. Implementation of necessary controls in response to a warning level response trigger will take place as expeditiously as possible, but in no event later than 12 months from the conclusion of the most recent calendar year.

   Should it be determined through the warning level study that action is necessary to reverse the noted trend, the procedures for control selection and implementation outlined under "action level response" shall be followed.

2. Action Level Response

   a. Annual Standard

   An action level response shall be prompted whenever a two-year average of the weighted annual means of 15.0 $\mu g/m^3$ or greater occurs within the maintenance area. A violation of the standard (three-year average of the weighted annual means of 15.0 $\mu g/m^3$ or greater) shall also

prompt an action level response. In the event that the action level is triggered and is not found to be due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, West Virginia DAQ in conjunction with the metropolitan planning organization or regional council of governments, will determine additional control measures needed to assure future attainment of the 1997 $PM_{2.5}$ NAAQS. In this case, measures that can be implemented in a short time will be selected in order to be in place within 18 months from the close of the calendar year that prompted the action level. West Virginia DAQ will also consider the timing of an action level trigger and determine if additional, significant new regulations not currently included as part of the maintenance provisions will be implemented in a timely manner and will constitute our response.

b. 24-hour Standard

An action level response shall be prompted whenever a two-year average of the 98th percentile 24-hour $PM_{2.5}$ concentration of 35 $\mu g/m^3$ or greater occurs within the maintenance area. A violation of the standard (three-year average of the 98th percentile of 35 $\mu g/m^3$ or greater) shall also prompt an action level response. In the event that the action level is triggered and is not found to be due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, West Virginia DAQ in conjunction with the metropolitan planning organization or regional council of governments, will determine additional control measures needed to assure future attainment of the 2006 PM2.5 NAAQS. In this case, measures that can be implemented in a short time will be selected in order to be in place within 18 months from the close of the calendar year that prompted the action level. West Virginia DAQ will also consider the timing of an action level trigger and determine if additional, significant new regulations not currently included as part of the maintenance provisions will be implemented in a timely manner and will constitute our response.

3. Control Measure Selection and Implementation

Adoption of any additional control measures is subject to the necessary administrative and legal process. This process will include publication of notices, an opportunity for public hearing, and other measures required by West Virginia law for rulemaking.

If a new measure/control is already promulgated and scheduled to be implemented at the federal or State level, and that measure/control is determined to be sufficient to address the upward trend in air quality, additional local measures may be unnecessary. Furthermore, West Virginia DAQ will submit to EPA an analysis to demonstrate the proposed measures are adequate to return the area to attainment.

C. Potential Contingency Measures

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. The selection of measures will be based on cost-effectiveness, emission reduction potential, economic and social considerations or other factors that West Virginia DAQ deems appropriate. West Virginia DAQ will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures. Because it is not possible at this time to determine what control measures will be appropriate at an unspecified time in the future, the list of contingency measures outlined below is not exhaustive.

1) Diesel reduction emission strategies.
2) Alternative fuel (e.g., liquid propane and compressed natural gas) and diesel retrofit programs for fleet vehicle operations.
3) Tighter $PM_{2.5}$, SO_2, and NO_x emissions offsets for new and modified major sources.
4) Concrete manufacturing - upgrade wet suppression.
5) Additional NO_x RACT statewide.

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

D. $PM_{2.5}$, SO_2, and NO_x sources potentially subject to future additional control requirements.

The following is a list of $PM_{2.5}$, SO_2, and NO_x sources potentially subject to future controls.

- ICI Boilers - SO_2 and NO_x controls;
- EGUs;
- process heaters;
- internal combustion engines;
- combustion turbines;
- other sources greater than 100 tons per year;
- Fleet vehicles;
- Concrete manufacturers;
- Aggregate processing plants.

IX. PUBLIC PARTICIPATION

West Virginia published notification for a public hearing and solicitation for public comment concerning the draft redesignation petitions and maintenance plans in the *West Virginia State Register*, the *Charleston Gazette* and the *Charleston Daily Mail* on October 26, 2012.

The public hearing to receive comments on the redesignation request is scheduled for 6:00 p.m. on Tuesday, November 27, 2012, at the West Virginia Division of Environmental Protection Headquarters located at 601 57th Street, SE, Charleston, WV. The public comment period closes on November 27, 2012. Appendix E includes a copy of the public notice.

X. CONCLUSIONS

The Charleston $PM_{2.5}$ nonattainment area has attained the 1997 annual and 24-hour NAAQS for $PM_{2.5}$ and complied with the applicable provisions of the 1990 Amendments to the CAA regarding redesignations of $PM_{2.5}$ nonattainment areas. Documentation to that effect is contained herein. West Virginia DAQ has prepared a redesignation request and maintenance plan that meet the requirements of Section 110 (a)(1) of the 1990 CAA.

If EPA finds any substantive deficiency with respect to one of West Virginia's requests for redesignation (and/or the associated maintenance plan) but not the other (e.g. EPA determines the 1997 request/maintenance plan is adequate but the 2006 request is not, or vice versa), then the State requests that EPA regard the redesignation requests as severable and continue processing the one found adequate.

Based on this presentation, the Charleston $PM_{2.5}$ nonattainment area meets the requirements for redesignation under the CAA and EPA guidance. West Virginia has performed an analyses showing the air quality improvements are due to permanent and enforceable measures. Furthermore, because this area is subject to significant transport of pollutants, significant regional SO_2 and NO_x reductions will ensure continued compliance (maintenance) with the standard with an increasing margin of safety.

The State of West Virginia hereby requests that the Charleston 1997 $PM_{2.5}$ nonattainment area be redesignated to attainment simultaneously with EPA approval of the CAA section 175A maintenance plan provisions contained herein.

In addition, the State of West Virginia hereby requests that the Charleston 2006 $PM_{2.5}$ nonattainment area be redesignated to attainment simultaneously with EPA approval of the CAA section 175A maintenance plan provisions contained herein.