Department of Environmental Conservation
Division of Air Resources

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Commissioner

REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE 1997 ANNUAL AND 2006 24-HOUR $PM_{2.5}$ NAAQS: NEW YORK–NORTHERN NEW JERSEY–LONG ISLAND, NY–NJ–CT NONATTAINMENT AREA

FINAL PROPOSED REVISION JUNE 2013

New York State Department of Environmental Conservation
Andrew M. Cuomo, GOVERNOR ***Joe Martens, COMMISSIONER***

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List of Commonly Used Acronyms and Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
ADRP	Acid Deposition Reduction Program
AQS	Air Quality System
ARM	Approved Regional Method
BART	Best Available Retrofit Technology
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CFR	Code of Federal Regulations
CMV	Commercial Marine Vessel
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CSAPR	Cross-State Air Pollution Rule
CSN	Chemical Speciation Network
Department	New York State Department of Environmental Conservation
DG	Distributed Generation
EDMS	Emission Dispersion Modeling System
EGU	Electric Generating Unit
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FEM	Federal Equivalent Method
FIP	Federal Implementation Plan
FRM	Federal Reference Method
GVWR	Gross Vehicle Weight Rating
HDV	Heavy-Duty Vehicle
HPMS	Highway Performance Monitoring System
I/M	Inspection/Maintenance
LPG	Liquefied Petroleum Gas
LTO	Landing and Take-Off
MANE-VU	Mid-Atlantic/Northeast Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
MPO	Metropolitan Planning Organization
MOVES	Motor Vehicle Emissions Simulator
MVEB	Motor Vehicle Emission Budget
NAAQS	National Ambient Air Quality Standard
NAMS	National Air Modeling Station
NEI	National Emission Inventory
NH_3	Ammonia
NO_x	Oxides of Nitrogen
NYCRR	New York Codes, Rules, and Regulations

NYMA	New York Metropolitan Area
NYSERDA	New York State Energy Research and Development Authority
NYTEST	New York Transient Emission Short Test
NYVIP	New York Vehicle Inspection Program
OBD	On-Board Diagnostics
PM	Particulate Matter
$PM_{2.5}$	Fine PM; Particulate Matter with an aerodynamic diameter $\leq$ 2.5 micrometers
PM_{10}	Coarse PM; Particulate Matter with an aerodynamic diameter $\leq$ 10 micrometers
QA	Quality Assurance
QC	Quality Control
RACT	Reasonably Available Control Technology
RE	Rule Effectiveness
RFG	Reformulated Gas
RVP	Reid Vapor Pressure
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur Dioxide
TIP	Transportation Implementation Plan
TPY	Tons per Year
TSD	Technical Support Document
TZHRC	Tappan Zee Hudson River Crossing
ULSD	Ultra Low Sulfur Diesel
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

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I. INTRODUCTION

A. Proposal

The New York State Department of Environmental Conservation (Department) is proposing a State Implementation Plan (SIP) revision for redesignation to attainment of the 1997 annual and the 2006 24-hour National Ambient Air Quality Standards (NAAQS) for fine particulates ($PM_{2.5}$). This redesignation request affects 10 counties in the New York Metropolitan Area (NYMA), which represents the New York State portion of the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area. The New York counties included in the nonattainment area are Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk, and Westchester Counties. This redesignation demonstration is being submitted pursuant to Clean Air Act (CAA) section 107(d)(3)(D). This document also contains a maintenance plan which ensures continued compliance with the annual and 24-hour NAAQS pursuant to CAA section 175A, and which is required in order for the U.S. Environmental Protection Agency (EPA) to promulgate a redesignation of the NYMA from nonattainment to attainment. It should be noted that approval action on SIP elements and the redesignation request may occur simultaneously.

This request for redesignation for the annual and 24-hour $PM_{2.5}$ NAAQS is based on the results of ambient air quality monitoring for $PM_{2.5}$ within the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area. Recent certified monitoring data demonstrate compliance with both the annual and 24-hour $PM_{2.5}$ NAAQS within the entire tri-state nonattainment area. The Department understands that all three states are formally pursuing the redesignation/maintenance process for both the annual and 24-hour $PM_{2.5}$ NAAQS.

As a result of monitoring data indicating compliance with the annual $PM_{2.5}$ NAAQS, on June 9, 2010, the Department submitted a clean data petition for the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area for the annual $PM_{2.5}$ NAAQS. EPA concurred with the Department's finding, and on December 15, 2010, finalized its determination that this area had attained the annual NAAQS.[1] This Federal Register notice is available as Appendix A – *EPA Determination of NYMA Attainment of the 1997 Annual $PM_{2.5}$ NAAQS*.

The Department also submitted on May 5, 2011 a clean data petition for this area pertaining to the 24-hour $PM_{2.5}$ NAAQS. On December 31, 2012, EPA finalized its approval of this petition, determining that the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area had attained the 24-hour NAAQS.[2] This Federal Register notice is available as Appendix B – *EPA Determination of NYMA Attainment of the 2006 24-Hour $PM_{2.5}$ NAAQS*.

Final approval of these clean data petitions eliminates the need to complete and submit attainment SIPs. Approval of this redesignation request and maintenance plan, meanwhile, will officially redesignate the NYMA to attainment for the annual and 24-hour standards, and thus alleviate additional program requirements faced by states subject to nonattainment designations.

[1] **Federal Register** / Vol. 75, No. 219, p. 69589; published November 15, 2010
[2] **Federal Register** / Vol. 77, No. 250, p. 76867; published December 31, 2012

B. Background of the $PM_{2.5}$ NAAQS

EPA established NAAQS for six criteria air pollutants, including particulate matter (PM) to protect the public health and welfare. EPA describes PM as "a complex mixture of extremely small particles and liquid droplets…made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles."[3]

$PM_{2.5}$ (i.e., PM with an aerodynamic diameter less than or equal to 2.5 micrometers) is produced by combustion, including vehicle exhaust, and by chemical reactions of gases such as sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (NH_3). Adverse health effects from breathing air with high $PM_{2.5}$ concentrations include premature death, increased respiratory symptoms and disease, chronic bronchitis, and decreased lung function—particularly for individuals with asthma.

Due to these potential health impacts, EPA introduced the $PM_{2.5}$ NAAQS in 1997.[4] (Previously, standards had been set for coarse particles, or PM_{10}.) NAAQS were established at 15 micrograms per cubic meter ($\mu g/m^3$), based on an annual arithmetic mean over three years, and at 65 $\mu g/m^3$, based on the 98th percentile of 24-hour values averaged over three years. These are known as the annual and 24-hour standards, respectively.

In 2006, based upon new scientific evidence, EPA revised the 24-hour standard, lowering it from 65 $\mu g/m^3$ to 35 $\mu g/m^3$.[5] This standard became effective December 18, 2006. At the same time, EPA decided to retain the existing annual standard of 15 $\mu g/m^3$.

C. Designations under Annual $PM_{2.5}$ NAAQS

Designations for the 1997 annual $PM_{2.5}$ NAAQS were issued by EPA on December 17, 2004 and became effective on April 5, 2005.[6] EPA identified 39 areas nationwide in nonattainment of the 15 $\mu g/m^3$ annual standard, based upon the 3-year average of annual mean $PM_{2.5}$ concentrations for the years 2001 through 2003. Among the areas designated as nonattainment was the New York–N. New Jersey–Long Island, NY–NJ–CT area. This nonattainment area includes the following New York counties: Bronx, Kings, Nassau, New York, Orange, Queens, Richmond, Rockland, Suffolk, and Westchester. The nonattainment area also includes ten counties in northern New Jersey and two counties in southwestern Connecticut.

In response to this designation, the Department was obligated to undertake planning and consider pollution control activities in order to attain this standard as quickly as possible. Under CAA section 172(a)(2)(A) the attainment deadline for this area is five years after designation, or April 5, 2010.

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[3] U.S. Environmental Protection Agency, "Particulate Matter" webpage, www.epa.gov/pm/
[4] **Federal Register** / Vol. 62, No. 138, p. 38652; published July 18, 1997
[5] **Federal Register** / Vol. 71, No. 200, p. 61144; published October 17, 2006
[6] **Federal Register** / Vol. 70, No. 3, p. 944; published January 5, 2005

D. Designations under 24-hour $PM_{2.5}$ NAAQS

Designations for the 2006 24-hour $PM_{2.5}$ NAAQS were made final by EPA effective December 14, 2009.[7] EPA identified 31 areas nationwide that exceeded the 35 µg/m^3 24-hour standard, based upon 98th percentile values from 2006 through 2008. Among the areas designated as nonattainment was the New York–N. New Jersey–Long Island, NY–NJ–CT area, with a 2008 design value of 38 µg/m^3. This nonattainment area includes the same 22 counties in New York, New Jersey, and Connecticut that were designated nonattainment under the annual standard.

In response to this designation, the Department was obligated to undertake planning and consider pollution control regulations in order to attain this standard as quickly as possible. Under CAA section 172(a)(2)(A) the attainment deadline for this area is five years after designation, or December 14, 2014.

II. DOCUMENTATION OF COMPLIANCE WITH REDESIGNATION REQUIREMENTS

In accordance with section 107(d)(3)(E) of the CAA, the EPA Administrator may not grant a request to redesignate an area to attainment unless the following conditions have been satisfied:

- The Administrator determines that the area has attained the NAAQS;
- The Administrator has fully approved the applicable implementation plan for the area under CAA section 110(k);
- The Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable federal air pollutant control regulations and other permanent and enforceable reductions;
- The Administrator has fully approved a maintenance plan for the area as meeting the requirements of CAA section 175A; and,
- The state containing such area has met all requirements applicable to the area under CAA section 110 and Part D.

The following sections document that the New York portion of the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area has met all the necessary requirements for redesignation to attainment under the 1997 annual and 2006 24-hour $PM_{2.5}$ standards.

A. Attainment of the 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS

This section discusses the means by which the Department is demonstrating attainment of the 1997 annual and 2006 24-hour $PM_{2.5}$ standards in the NYMA. On November, 15, 2010, EPA determined that the New York–N. New Jersey–Long Island, NY–NJ–CT area, designated nonattainment for the 1997 annual $PM_{2.5}$ NAAQS, had since attained that standard. This determination was based upon quality assured, quality controlled, and certified ambient air monitoring data for the 2007 through 2009 monitoring period (i.e., a 2009 design value).

[7] **Federal Register** / Vol. 74, No. 218, p. 58688; published November 13, 2009

Compliance with the standard was further demonstrated with the subsequent availability of 2010 monitoring data.

EPA's initial designations for the 24-hour standard were made based on monitored values for years 2006 through 2008 (i.e., a 2008 design value). On May 5, 2011 the Department submitted to EPA a clean data petition for the NYMA which demonstrated that, based on 2009 and 2010 design values, the NYMA is now in full compliance with this NAAQS. EPA finalized approval of this petition on December 31, 2012.

Monitored data for 2011 further demonstrate the permanent nature of these reduced $PM_{2.5}$ concentrations. These data are presented in Appendix C – *NYMA 2011 Design Values for the Annual and 24-Hour $PM_{2.5}$ NAAQS*. The highest 2011 annual design value for the tri-state NYMA was 11.9 µg/m^3, recorded at the Morrisania (NY) monitor. This represents a decrease from the NYMA's peak 2010 design value of 12.5 µg/m^3, also recorded at Morrisania. Meanwhile, the NYMA's highest 2011 24-hour design value was 30 µg/m^3, recorded at New Jersey's Elizabeth Turnpike monitor. This matched 2010's peak design value for the NYMA, also at the Elizabeth Turnpike monitor.

1. The $PM_{2.5}$ Monitoring Network

The Department maintains a monitoring network that fulfills EPA requirements and is sufficient to accurately gauge air quality in the NYMA and other regions of New York State. As required by Title 40 of the Code of Federal Regulations (CFR), Part 58.10(d), "*the State...agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this Part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network*."

The Department completed and submitted to EPA its "New York State Ambient Air Monitoring Program Network Assessment" in May, 2010 in order to meet this requirement. As a part of this plan, all monitoring networks operated by the Department's Bureau of Air Quality Surveillance in the Division of Air Resources were evaluated to ensure they met the monitoring objectives as defined by the regulations. Considerations were given to population and geographical coverage, air quality trends, attainment classification, emissions inventory, parameters monitored, special purpose monitors, health-related and scientific research, external data users, new and proposed regulations, quality assurance (QA), technology, personnel, and training.

Additionally, starting in July, 2007, each state (or where applicable, local) agency is required to "*adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, CSN stations, state speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations*."[8] The Department prepares an Annual Monitoring Network Plan as part of the

[8] **Code of Federal Regulations** / Title 40, Section 58.10

fulfillment of these requirements. EPA approved the majority of the latest version of this plan on October 18, 2012.

The State and Local Air Monitoring Stations (SLAMS) together with the National Air Monitoring Stations (NAMS) constitute New York's Ambient Air Monitoring System which provides the data used to demonstrate attainment. The principal objective of the $PM_{2.5}$ monitoring network is to determine the exposure of the state's population to ambient $PM_{2.5}$. This objective is the primary focus of the Federal Reference Method (FRM) filter-based samplers as well as for the continuous mass monitoring network. The protocols and equipment used for the FRM network are meticulously specified in the CFR to ensure that the measurements are consistent from one state to another. The continuous mass monitoring instruments cannot accurately provide data for direct comparison with the NAAQS, but these instruments actually provide the most useful data for population exposure. The continuous $PM_{2.5}$ data are updated every hour in order to provide near real-time health related forecasts, warnings, and updates of current pollution concentrations.

The QA provided for all ambient air monitoring activities in New York State ensures that the ambient air monitoring data are accurate, precise, and complete. Oversight is provided through a series of QA field audits completed independently from the monitoring operators' routine checks and audits. All QA requirements specified in the monitoring rules (i.e., 40 CFR Parts 53 and 58) are adhered to.

The Department's Ambient Air Monitoring Section in the Bureau of Quality Assurance conducts two types of audits, which are performed at each monitoring location at approximately six month intervals:

- A Performance Audit checks the accuracy of the field monitoring equipment. It is performed by Department oversight staff with QA Standards Laboratory audit equipment, thus ensuring independence from the normal monitoring operators and their calibration equipment.
- A Systems Audit is a check on the entire operation of the monitoring program. This audit examines the field operators' procedures, techniques, and schedules. It also checks the supervising engineers' review of the operators' records, the actual data obtained, and the results being recorded in the database.

Once the QA process is complete and ambient air monitoring data have been assured as accurate, precise, and complete, these data are submitted by the Department to EPA's Air Quality System (AQS) for public access.

The monitoring data for these NYMA redesignation requests are provided by the monitors that are listed in Table 1 and shown in Figures 1 and 2 (with Figure 2 providing a more detailed view of monitors in New York City). These monitors are FRM samplers which are a part of the overall $PM_{2.5}$ monitoring network used for comparison to the NAAQS. All samplers employ 1-in-3 day sampling with the exception of the IS 52 and Queens College monitors, which sample daily.

Table 1. $PM_{2.5}$ FRM Samplers Serving the New York Metropolitan Area

Monitor	AQS ID	Address	County	Coordinates
Hempstead	36-059-0008	Lawrence High School Arlington Place, Cedarhurst 11516	Nassau	40.6310 N -73.7339 W
Babylon	36-103-0002	Farmingdale Water District 72 Gazza Blvd., Babylon 11735	Suffolk	40.7429 N -73.41919 W
JHS 45	36-061-0079	NYC Dept. of Education - JHS 45 2351 1st Ave., New York 10035	New York	40.79970 N -73.93432 W
PS 19	36-061-0128	NYC Dept. of Education – PS 19 185 1st Ave., New York 10003	New York	40.73000 N -73.98446 W
Division Street	36-061-0134	NYC Dept. of Education - PS 124 40 Division St., New York 10002	New York	40.71436 N -73.99518 W
Morrisania	36-005-0080	Diagnostic & Treatment Center 1225-57 Gerard Ave., Bronx 10452	Bronx	40.83606 N -73.92009 W
Botanical Garden [sampler moved from Harding to Pfizer 1/1/08]	Harding Lab: 36-005-0083	200th St. & Southern Blvd., Bronx 10458	Bronx	40.86585 N -73.88083 W
	Pfizer Lab: 36-005-0133			40.86790 N -73.87809 W
IS 52	36-005-0110	NYC Dept. of Education - PS 52/MS 302 681 Kelly St., Bronx 10455	Bronx	40.8162 N -73.9020 W
JHS 126	36-047-0122	NYC Dept. of Education - JHS 126 424 Leonard St., JHS 126, Brooklyn 11222	Kings	40.71961 N -73.94771 W
Queens College/ PS 219	36-081-0124	144-39 Gravett Rd., Flushing 11367	Queens	40.73619 N -73.82318 W
Susan Wagner	36-085-0067	NYC Dept. of Education - Susan Wagner HS 1200 Manor Ave., Staten Island 10314	Richmond	40.59664 N -74.12525 W
Port Richmond	36-085-0055	U.S. Post Office - Port Richmond Station 364 Port Richmond Ave, Staten Island 10302	Richmond	40.63307 N -74.13719 W
Newburgh	36-071-0002	Public Safety Building 55 Broadway, Newburgh 12550	Orange	41.49916 N -74.00885 W
Mamaroneck	36-119-1002	NYSDOT - Larchmont Maintenance Facility 627 5th Ave., Larchmont 10538	Westchester	40.93149 N -73.76575 W

Figure 1. NYMA $PM_{2.5}$ Monitor Locations

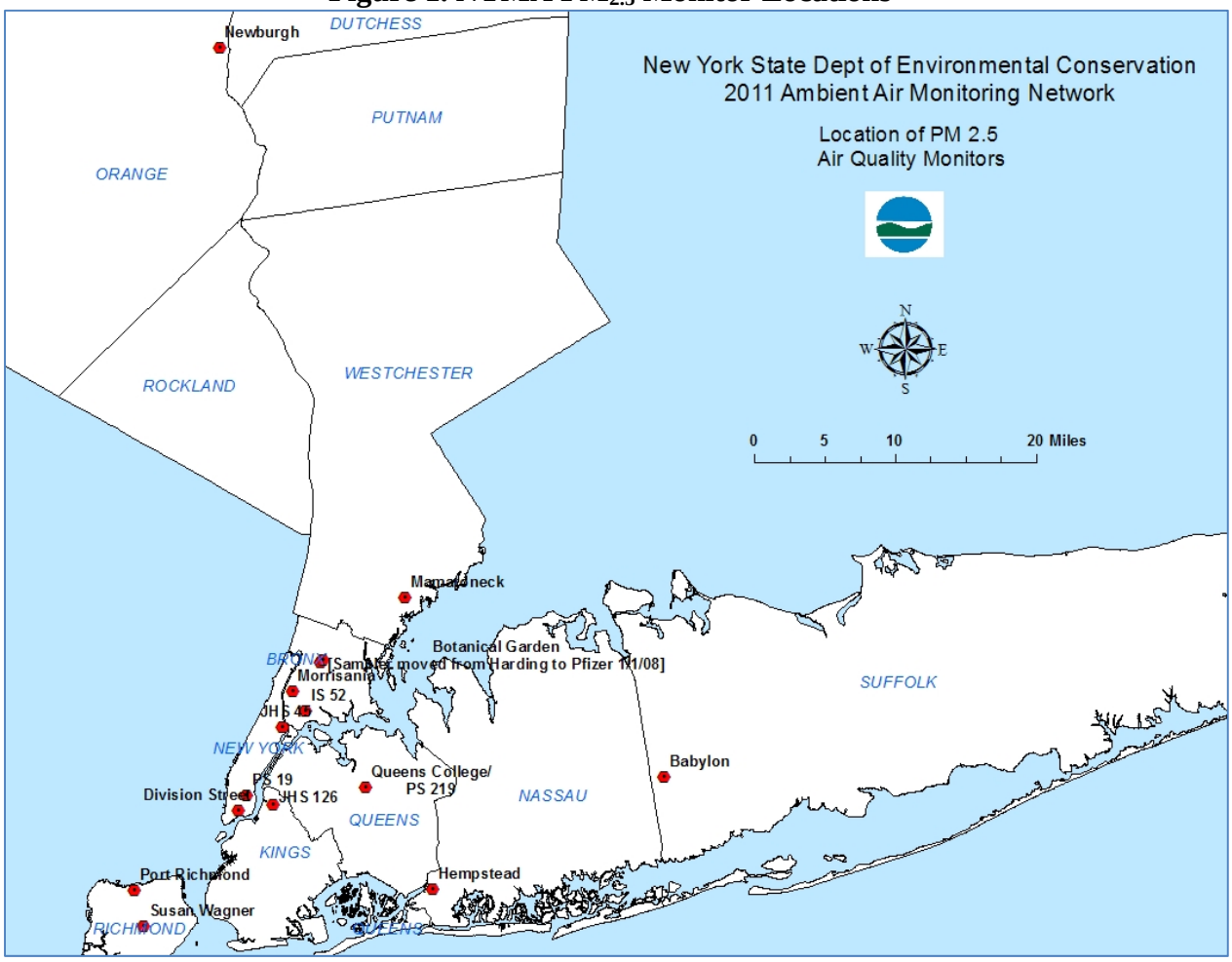
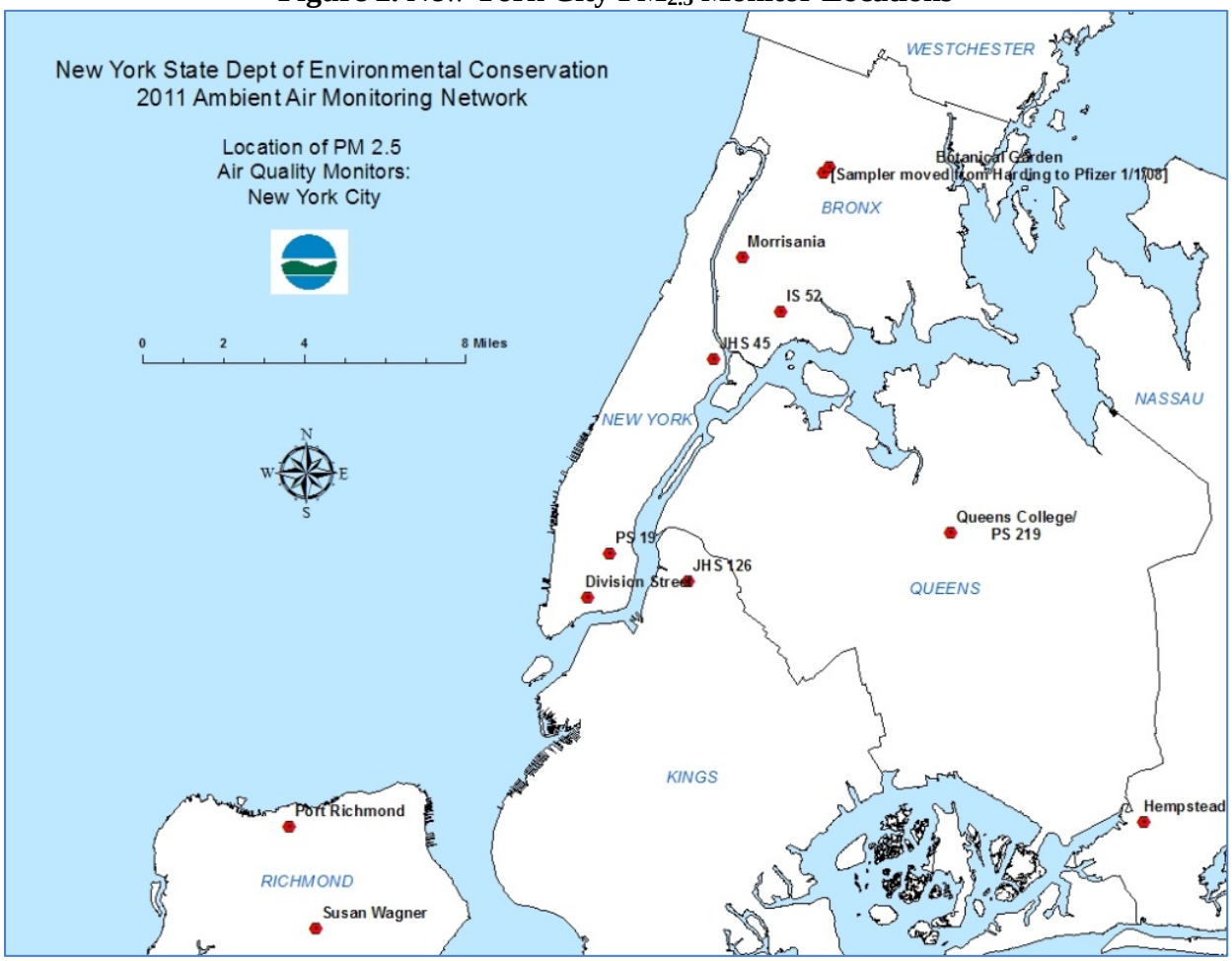


Figure 2. New York City $PM_{2.5}$ Monitor Locations



2. 2009 and 2010 Design Values

The 2009 and 2010 design values (based on monitoring data from years 2007 through 2009, and 2008 through 2010, respectively) are presented in Table 2 for the annual standard and in Table 3 for the 24-hour standard. At each population-oriented monitor within an area, the design values for the annual standard are based on the annual arithmetic mean over three years; the design values for the 24-hour standard are based on the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area.

As shown in these tables, the maximum 2009 and 2010 design values for the annual standard are 13.9 $\mu g/m^3$ and 12.5 $\mu g/m^3$, respectively, both associated with the Morrisania monitor. The maximum 2009 and 2010 design values for the 24-hour standard are 33 $\mu g/m^3$ and 29 $\mu g/m^3$, respectively, with each being associated with multiple monitors.

Table 2. 2009 and 2010 Design Values for the 1997 Annual $PM_{2.5}$ Standard ($\mu g/m^3$)

Monitoring Site	AQS ID	2007 Avg.	2008 Avg.	2009 Avg.	2010 Avg.	2009 Design Value	2010 Design Value
Hempstead	36-059-0008	11.1	10.9	9.0	8.7	10.3	9.5
Babylon	36-103-0002	10.9	10.1	8.1	8.4	9.7	8.9
JHS 45	36-061-0079	13.6	12.2	10.4	9.8	12.1	10.8
Division Street	36-061-0134	13.3	13.2	11.6	11.5	12.7	12.1
Morrisania	36-005-0080	15.6	13.5	12.7	11.4	13.9	12.5
Botanical Garden	36-005-0083/0133	13.2	11.7	10.0	10.0	11.6	10.6
IS 52	36-005-0110	12.8	11.8	10.8	10.2*	11.8	N/A
JHS 126	36-047-0122	13.9	12.0	10.7	9.9	12.2	10.9
Queens College	36-081-0124	11.4	11.0	9.5	9.4	10.6	10.0
Susan Wagner	36-085-0067	11.5	10.7	8.5	8.2	10.2	9.1
Port Richmond	36-085-0055	13.0	12.1	9.8	9.7	11.6	10.5
Newburgh	36-071-0002	10.6	9.5	7.9	8.1	9.3	8.5
Mamaroneck	36-119-1002	11.7	11.0	9.1	8.8	10.6	9.6

*Sampling suspended during latter half of 2010 due to nearby construction

Table 3. 2009 and 2010 Design Values for the 2006 24-Hour $PM_{2.5}$ Standard ($\mu g/m^3$)

Monitoring Site	AQS ID	2007 98th %	2008 98th %	2009 98th %	2010 98th %	2009 Design Value	2010 Design Value
Hempstead	36-059-0008	28.5	29.2	25.8	20.2	28	25
Babylon	36-103-0002	28.8	26.8	21.6	26.1	26	25
JHS 45	36-061-0079	34.3	32.3	28.8	25.2	32	29
Division Street	36-061-0134	37.1	31.8	29.0	27.0	33	29
Morrisania	36-005-0080	36.2	31.3	30.0	27.0	33	29
Botanical Garden	36-005-0083/0133	32.5	29.8	27.4	24.8	30	27
IS 52	36-005-0110	34.4	29.9	30.6	25.4*	32	N/A
JHS 126	36-047-0122	33.6	29.4	26.9	24.8	30	27
Queens College	36-081-0124	31.8	30.3	26.7	25.5	30	28
Susan Wagner	36-085-0067	28.8	27.7	23.0	21.5	27	24
Port Richmond	36-085-0055	32.8	28.7	24.6	25.5	29	26
Newburgh	36-071-0002	30.4	26.0	20.6	26.5	26	24
Mamaroneck	36-119-1002	30.6	30.4	27.0	26.7	29	28

*Sampling suspended during latter half of 2010 due to nearby construction

Certain data completeness issues arose when calculating these 2009 and 2010 design values for the annual and 24-hour standards. This included monitors with inadequate sampling rates during an individual quarter, suspension of sampling affecting multiple quarters (commonly due to nearby construction, which greatly impacts ambient $PM_{2.5}$ concentrations), and the permanent closure of two monitoring sites.

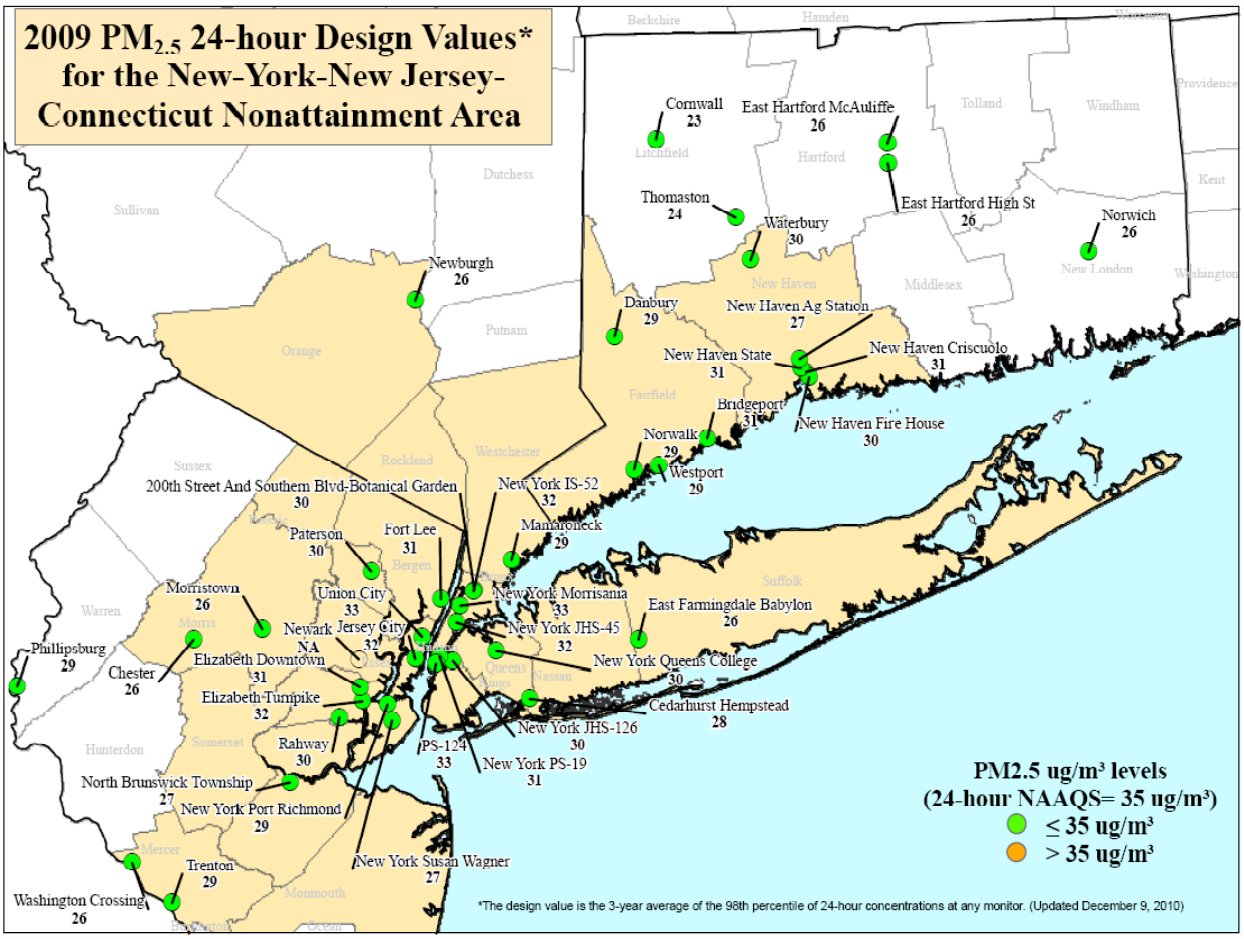
Data-handling conventions for these standards are illustrated in Appendix N of 40 CFR Part 50. Appendix N states that "[t]he use of less than complete data is subject to the approval of EPA, which may consider factors such as monitoring site closures/moves, monitoring diligence, and

nearby concentrations in determining whether to use such data."[9] The Department presented solutions to these data completeness issues in an attachment to its clean data petition for the 24-hour $PM_{2.5}$ NAAQS, which was submitted to EPA on May 5, 2011 and approved on December 31, 2012. These issues should therefore not affect the finding that the NYMA has reached attainment of these standards.

3. Adjacent States within the Nonattainment Area

Portions of the states of Connecticut and New Jersey, in addition to a portion of New York, comprise the New York–N. New Jersey–Long Island, NY–NJ–CT nonattainment area. It is thus important to assess and evaluate the monitoring data for these adjacent areas in addition to the data for the New York portion of the nonattainment area. Figure 3 shows the location of the $PM_{2.5}$ monitors within the entire nonattainment area, as well as the associated 24-hour design values for 2009. [10]

Figure 3. Tri-State Monitor Locations and 2009 24-Hour Design Values



[9] 40 CFR Chapter 1, Part 50, Appendix N – "*Interpretation of the National Ambient Air Quality Standards for $PM_{2.5}$,*" July 1, 2011 edition, p.127

[10] Source: Connecticut Department of Environmental Protection

Tables 4 and 5 display the yearly values and the 2009 and 2010 design values for the annual and 24-hour standards, respectively, for each monitoring site within the New Jersey and Connecticut portions of the NY-NJ-CT nonattainment area. All design values in these states are also below the relevant standards.

Table 4. 2009 and 2010 Design Values for the 1997 Annual $PM_{2.5}$ Standard – CT and NJ

	Monitoring Site	AQS ID	2007 Avg.	2008 Avg.	2009 Avg.	2010 Avg.	2009 Design Value	2010 Design Value
Connecticut	Bridgeport Roosevelt	09-001-0010	12.7	11.9	9.4	8.8	11.3	10.0
	Danbury WCSU	09-001-1123	12.0	11.7	9.2	9.1	11.0	10.0
	Norwalk*	09-001-3005	11.9	11.8	9.5	8.7	11.1	10.0
	Westport	09-001-9003	10.9	10.2	8.9	8.6	10.0	9.2
	New Haven Fire House**	09-009-0026	11.6	11.5	9.2	10.2	10.8	N/A
	New Haven Criscuolo Park	09-009-0027	11.5	11.3	9.7	8.9	10.8	9.9
	New Haven State St	09-009-1123	12.3	12.1	9.9	9.0	11.4	10.3
	New Haven Ag. Station*	09-009-2008	10.8	10.6	8.5	9.0	10.0	N/A
	Waterbury	09-009-2123	12.0	11.7	9.4	9.2	11.0	10.1
New Jersey	Fort Lee	34 003 0003	13.3	11.6	9.0	8.8	11.3	9.8
	Newark Cultural Center***	34 013 0015	13.4	13.7	N/A	N/A	N/A	NA
	Newark Firehouse****	34 013 0003	N/A	N/A	N/A	9.2	N/A	NA
	Jersey City Primary	34 017 1002	13.2	12.1	10.3	9.6	11.9	10.6
	Union City	34 017 2002	15.1	13.3	10.7	10.6	13.0	11.5
	Trenton	34 021 0008	12.1	11.2	9.2	9.6	10.9	10.0
	Washington Crossing	34 021 8001	10.2	10.0	7.8	8.2	9.3	8.7
	New Brunswick	34 023 0006	12.3	10.9	8.0	7.4	10.4	8.8
	Morristown	34 027 0004	11.5	9.4	8.1	8.5	9.7	8.7
	Chester	34 027 3001	10.4	8.8	7.1	7.6	8.8	7.8
	Paterson	34 031 0005	13.5	11.4	8.9	8.9	11.3	9.7
	Elizabeth Turnpike Primary	34 039 0004	13.9	12.9	11.2	10.6	12.7	11.6
	Elizabeth Downtown	34 039 0006	13.1	12.4	9.3	9.2	11.6	10.3
	Rahway	34 039 2003	13.2	12.0	9.3	9.3	11.5	10.2

*Data incomplete due to multiple technical issues at site
**Data incomplete due to site shutdown (redundancy study determined it to be low priority)
***Monitor at Newark Cultural Center shut down 7/24/2008
****Monitor at Newark Firehouse commenced operation 6/30/2009

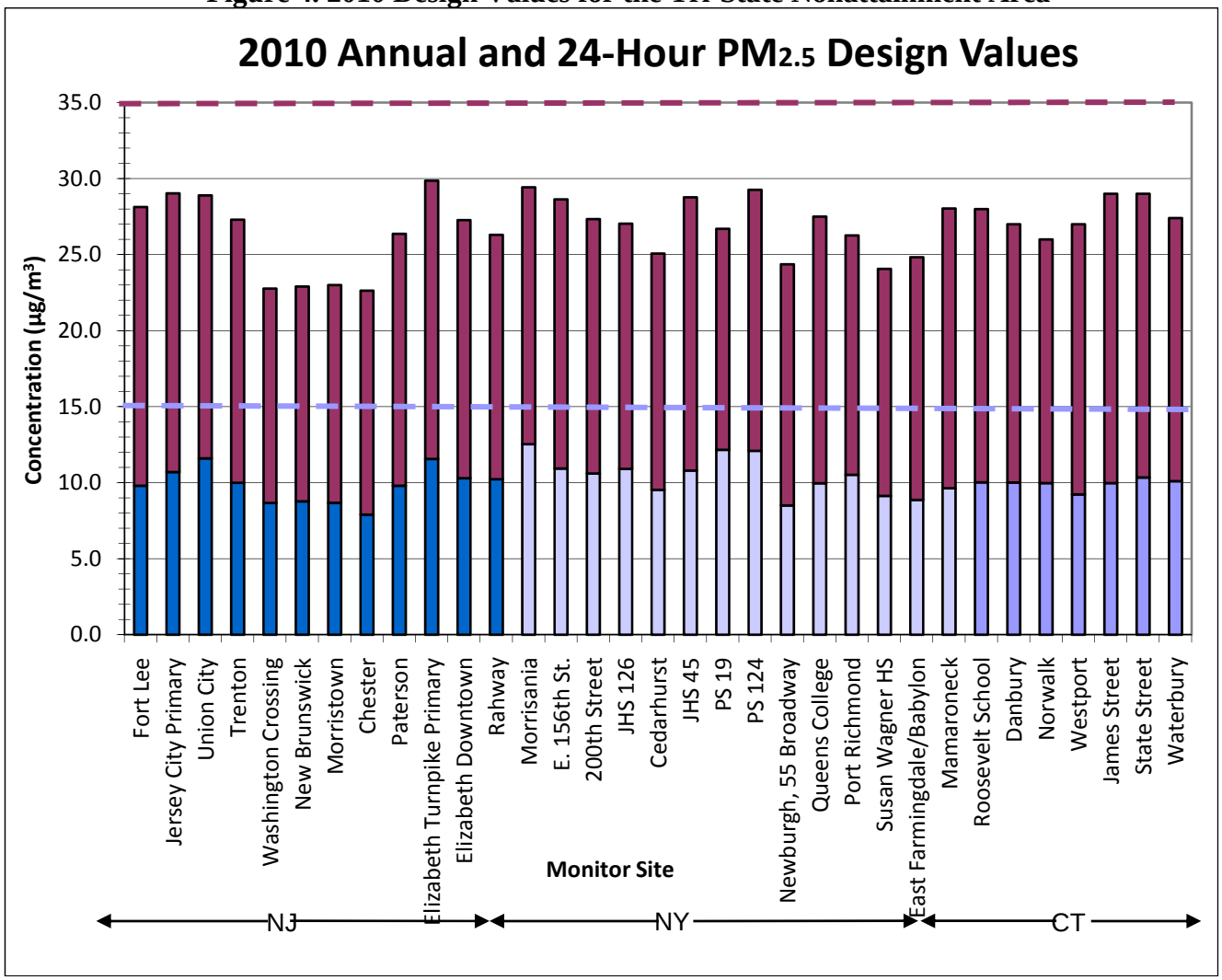
Table 5. 2009 and 2010 Design Values for the 2006 24-Hour $PM_{2.5}$ Standard – CT and NJ

	Monitoring Site	AQS ID	2007 98th %	2008 98th %	2009 98th %	2010 98th %	2009 Design Value	2010 Design Value
Connecticut	Bridgeport Roosevelt	09-001-0010	30.2	32.3	29.3	23.3	31	28
	Danbury WCSU	09-001-1123	30.4	27.5	27.6	25.7	29	27
	Norwalk*	09-001-3005	31.9	26.3	29.3	23.0	29	26
	Westport	09-001-9003	29.0	30.7	26.4	24.2	29	27
	New Haven Firehouse**	09-009-0026	29.8	30.9	28.5	21.7	30	N/A
	New Haven Criscuolo Park	09-009-0027	30.5	31.5	30.2	25.5	31	29
	New Haven State St	09-009-1123	30.6	32.1	30.8	23.9	31	29
	New Haven Ag. Station*	09-009-2008	28.5	25.4	27.3	19.5	27	N/A
	Waterbury	09-009-2123	32.7	28.4	28.1	25.7	30	27
New Jersey	Fort Lee	34 003 0003	34.5	32.2	27.0	25.1	31	28
	Newark Cultural Center***	34 013 0015	34.9	28.7	N/A	N/A	N/A	N/A
	Newark Firehouse****	34 013 0003	N/A	N/A	N/A	24.0	N/A	N/A
	Jersey City Primary	34 017 1002	34.9	32.0	29.0	26.4	32	29
	Union City	34 017 2002	39.1	33.4	25.0	26.7	33	29
	Trenton	34 021 0008	32.5	31.0	23.0	27.7	29	27
	Washington Crossing	34 021 8001	27.2	27.6	25.0	18.5	27	23
	New Brunswick	34 023 0006	30.4	28.9	21.0	19.1	27	23
	Morristown	34 027 0004	32.4	23.8	22.0	23.3	26	23
	Chester	34 027 3001	31.4	24.3	21.0	22.7	26	23
	Paterson	34 031 0005	36.6	28.6	26.0	24.4	30	26
	Elizabeth Tpk. Primary	34 039 0004	35.0	33.8	28.0	28.1	32	30
	Elizabeth Downtown	34 039 0006	35.9	31.1	26.0	25.1	31	27
	Rahway	34 039 2003	33.4	29.9	25.0	23.8	30	26

*Data incomplete due to multiple technical issues at site
**Data incomplete due to site shutdown (redundancy study determined it to be low priority)
***Monitor at Newark Cultural Center shut down 7/24/2008
****Monitor at Newark Firehouse commenced operation 6/30/2009

Figure 4 shows these 2010 24-hour and annual $PM_{2.5}$ design values graphically for all monitors in the tri-state nonattainment area.[11] The lower portion of each bar (blue) shows the annual design values for each monitor location, with the corresponding 24-hour design value stacked on top (brown). As seen in Tables 4 and 5, all locations have both annual and 24-hour design values below the respective standards of 15 µg/m^3 and 35 µg/m^3.

Figure 4. 2010 Design Values for the Tri-State Nonattainment Area



Looking further back in time, the design values for all three states show a downward trend over the past 10 years for both the annual and 24-hour standards. This is evidenced in Table 6—the "maximum design value" refers to the value at the NYMA monitor with the highest design value within each state.

[11] Source: New Jersey Department of Environmental Protection

Table 6. Recent Maximum Design Values in the NYMA

Year	Max Annual DV			Max Annual % NAAQS			Max 24-Hr DV			Max 24-Hr % NAAQS		
	CT	NJ	NY	CT	NJ	NY	CT	NJ	NY	CT	NJ	NY
2001	16.8	17.5	-	112%	117%	-	40	48	-	114%	137%	-
2002	16.4	16.6	17.6	109%	111%	117%	40	44	40	114%	126%	114%
2003	16.6	16.3	17.6	111%	109%	117%	41	39	40	117%	111%	114%
2004	12.6	16.8	16.8	84%	112%	112%	39	40	40	111%	114%	114%
2005	13.4	17.4	17.0	89%	116%	113%	40	44	41	114%	126%	117%
2006	13.2	15.7	15.6	88%	105%	104%	38	43	40	109%	123%	114%
2007	13.2	14.4	15.8	88%	96%	105%	36	41	39	103%	117%	111%
2008	12.4	14.1	14.3	83%	94%	95%	34	38	36	97%	109%	103%
2009	11.4	13.0	13.9	76%	87%	93%	31	33	33	89%	94%	94%
2010	10.3	11.6	12.5	69%	77%	83%	29	30	30	83%	86%	86%

The data from Table 6 are displayed graphically in Figures 5 and 6. Connecticut's maximum design values have not exceeded the annual NAAQS since 2003, and New Jersey's maximum design values have not exceeded that standard since 2006. Likewise, Connecticut has not exceeded the 24-hour NAAQS since 2007, and New Jersey has not exceeded that standard since 2008.

Figure 5. Maximum Annual Design Value Trends in the NYMA

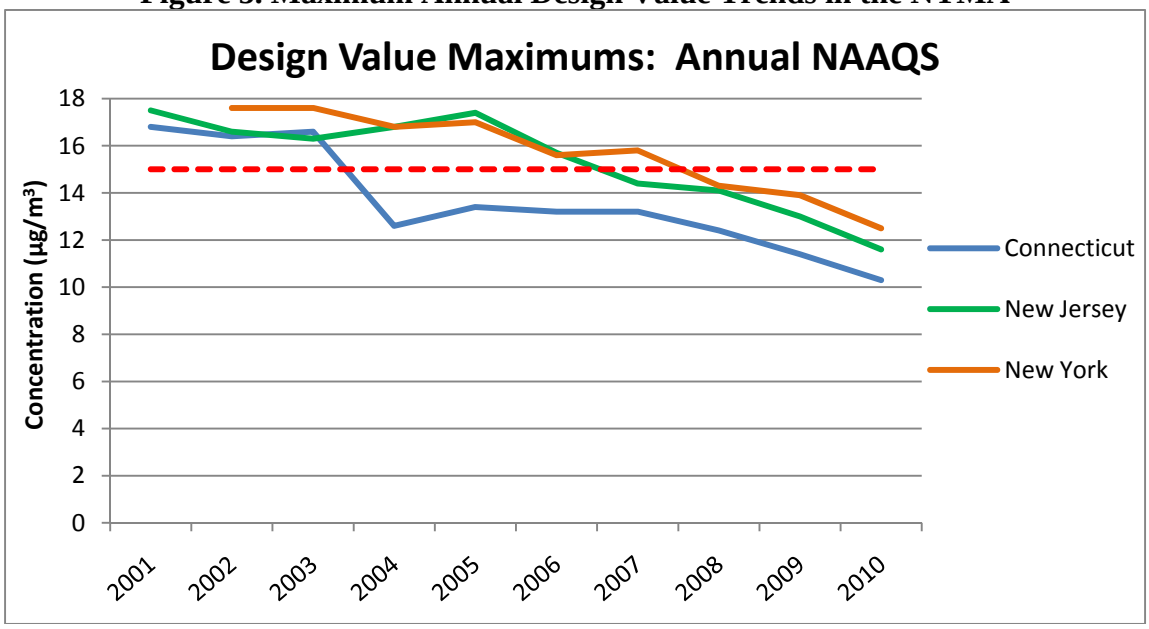
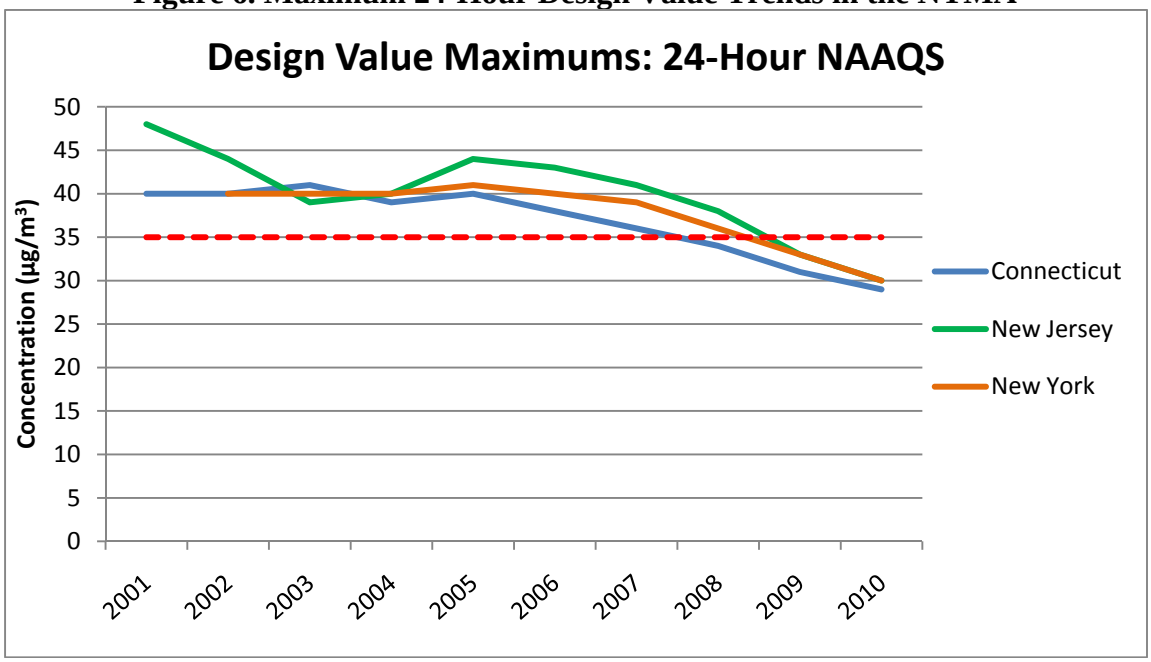


Figure 6. Maximum 24-Hour Design Value Trends in the NYMA



B. Fully Approved SIP under Section 110(k)

The granting of a redesignation is contingent on EPA approving an area's SIP or SIP revision under CAA section 110(k). The Department submitted to EPA an attainment SIP for the annual $PM_{2.5}$ standard on October 27, 2009. A clean data petition was later submitted on June 9, 2010, using a 2009 design value to demonstrate attainment. As previously noted, a clean data determination was granted by EPA. (Note that since EPA approved the clean data petition, there was no longer any reason to approve the attainment SIP.)

The monitoring data for the NYMA demonstrated attainment of the 2006 24-hour standard just a year after designations were made, and prior to the deadline by which to submit an attainment SIP. In lieu of submitting a full attainment SIP for the 24-hour standard to EPA, the Department submitted a clean data petition to EPA on May 5, 2011. This petition relied on the same 2009 and 2010 design values included in this redesignation request. On December 31, 2012, EPA published approval of this petition. This approved clean data determination suspends the requirements for submitting a SIP revision concerning attainment demonstrations, reasonable further progress measures, and contingency measures. The clean data determination does not eliminate the emission inventory, New Source Review, or transportation conformity requirements, however.

The maintenance plan portion of this document contains a 2007 base year emissions inventory for the NYMA. With approval of this base year inventory, EPA will have fully approved the New York SIP for the NYMA under section 110(k) for all requirements applicable for purposes of redesignation.

The Department has therefore satisfied the requirements for demonstrating attainment of the annual and 24-hour standards for $PM_{2.5}$. New York will continue to operate its air quality

monitoring network, and if the NYMA or another area within New York experiences a violation of either standard, that area would be subject to a requirement to submit the pertinent SIP revision(s) and would also need to address the requirements for attainment demonstrations, reasonable further progress measures, and contingency measures.

C. Permanent and Enforceable Reductions

Redesignation requests must demonstrate that improvements in air quality are based on permanent and enforceable emission reductions. These reductions would come from such sources as applicable federal rules, state regulations, and permit limits.

In a January 4, 2013 decision by the U.S. Court of Appeals for the D.C. Circuit, the court upheld a challenge to EPA's use of CAA Part D, Subpart 1 for the $PM_{2.5}$ NAAQS. The court ruled that Part D, Subpart 4, despite its references only to the PM_{10} NAAQS, applied to all PM having a diameter equal to or less than 10 micrometers, including $PM_{2.5}$. The Department affirms that this redesignation request and the associated maintenance plan comply with the requirements of Subpart 4.

The permanent and enforceable measures discussed in this document primarily resulted in emission reductions from SO_2 and NO_x, the pollutants that most significantly contributed to secondary PM formation. VOCs, to a lesser extent, also contributed to PM formation, while ammonia was not considered a significant precursor. (Ammonia emissions in the NYMA are currently low, particularly when compared to emissions of other precursors and direct PM, and are projected to decrease approximately 18 percent between the 2007 base year and 2025 projection year.) By expeditiously attaining the $PM_{2.5}$ NAAQS through the targeted emissions reductions of these precursors, the Department has satisfied the provisions of CAA section 189(e). Attainment of the NAAQS in this expeditious manner also demonstrates that the Reasonably Available Control Measure requirements for $PM_{2.5}$ and the significant precursors have been satisfied.

Figures 7 and 8 display the trend in $PM_{2.5}$ concentrations over the last decade for the New York NYMA monitors. In Figure 7, the concentration for each year was calculated by averaging the arithmetic mean values (as used to calculate the annual design values) at the monitors listed in Table 1 and shown in Figure 1. Figure 8 displays the trends using average concentrations based on the 98th percentile values (as used to calculate the 24-hour design values) at these same monitors.

Figure 7. NYMA Design Value Trend for the Annual NAAQS

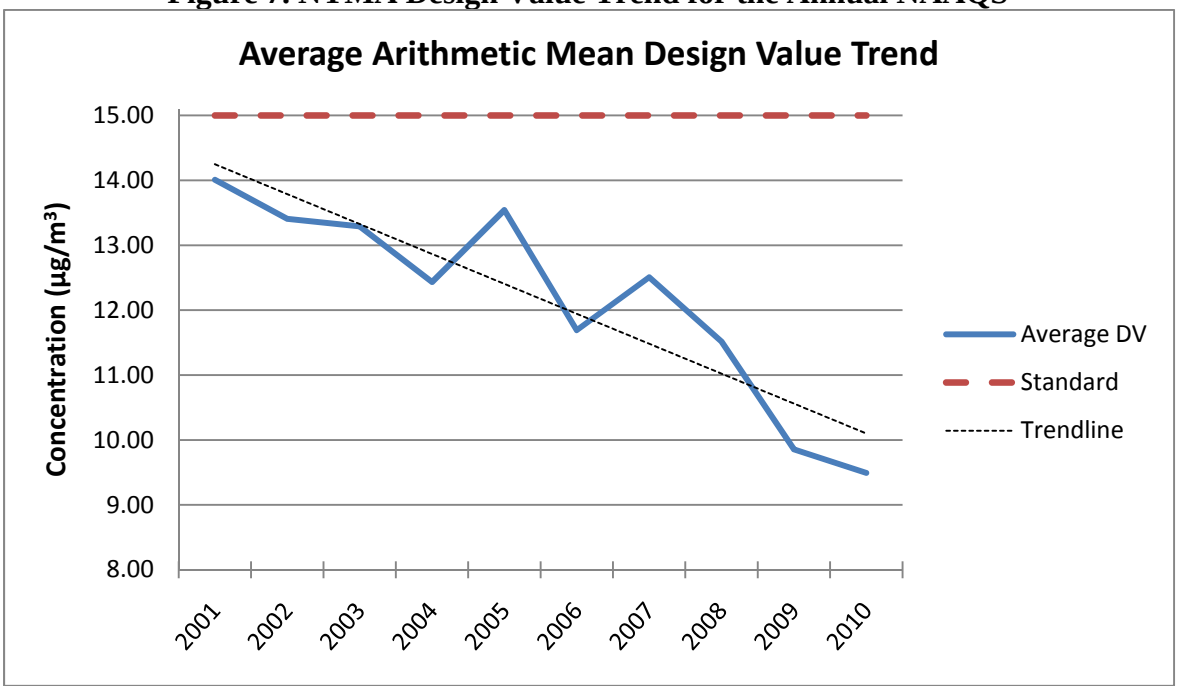
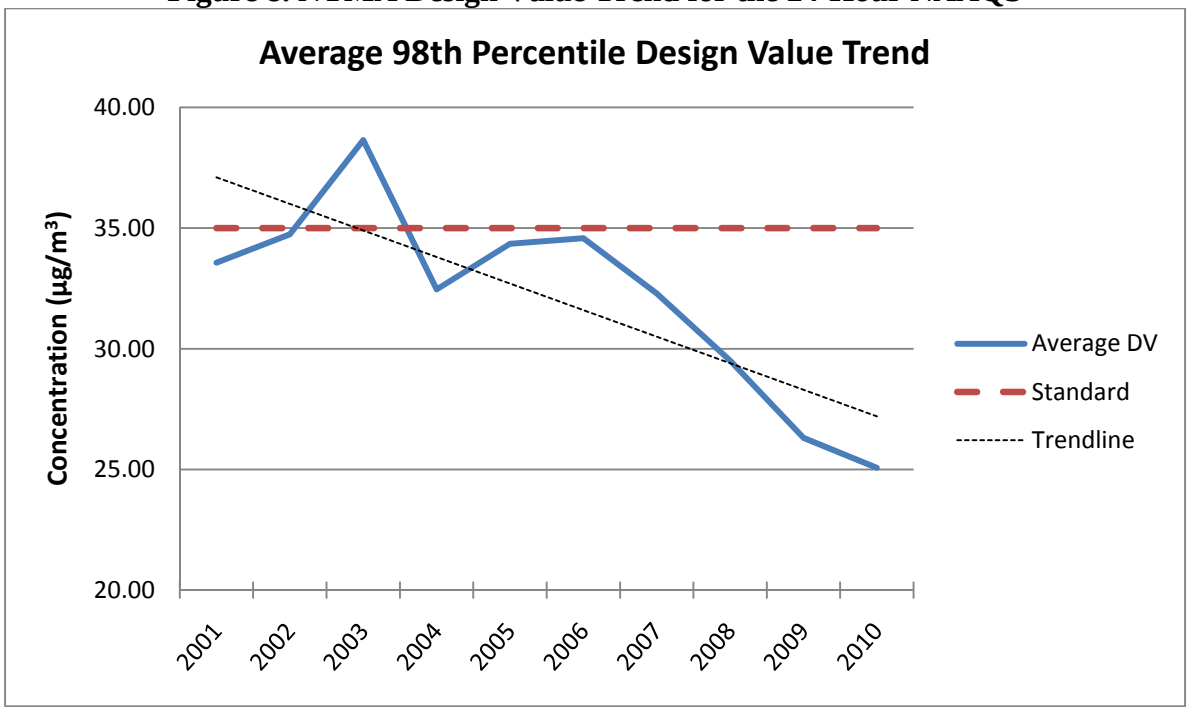


Figure 8. NYMA Design Value Trend for the 24-Hour NAAQS



These graphs display the average design value among all NYMA monitors – whereas the maximum design value at an individual monitor is compared to the NAAQS for attainment/nonattainment purposes. They serve to illustrate the general downward trend of $PM_{2.5}$ concentrations in the NYMA which the Department attributes to permanent and

enforceable reductions resulting from the many state and federal control programs targeting PM and its precursors. This decline in ambient $PM_{2.5}$ concentrations in the NYMA is the result of years of planning and concerted effort at the local, state, and federal levels in an effort to reduce SO_2, NO_x, VOC, and direct PM emissions. These planning efforts have focused on the point, area, and mobile source sectors, both in New York City and across the state. Emission reductions from upwind portions of the state also benefit air quality in the NYMA.

1. Stationary and Area Sources

There are few state and federal regulations that place specific requirements on direct PM emissions from stationary and area sources. The Department's New Source Review regulation does contain requirements for $PM_{2.5}$; otherwise, PM pollution is most commonly reduced through regulations that affect precursors—generally SO_2, NO_x, and, while not a significant precursor for $PM_{2.5}$ formation, VOCs. VOCs are precursors to ozone formation and, as a result, are regulated for ozone and therefore have the co-benefit of reducing secondary $PM_{2.5}$ formation.

Some of these emissions reductions have resulted from federal trading programs: the NO_x Budget Trading Program for ozone season NO_x emissions, the Acid Deposition Reduction Program (ADRP) for SO_2 and non-ozone season NO_x emissions, and the Clean Air Interstate Rule (CAIR) for SO_2 and NO_x emissions. The Department, meanwhile, has promulgated many regulations under Title 6 of the New York Codes, Rules, and Regulations (NYCRR) that target PM precursors in order to comply with the PM NAAQS as well as other NAAQS and air quality requirements. A number of these regulations have resulted from efforts of the Ozone Transport Commission (OTC) to address regional ozone issues. Because NO_x and VOCs represent the primary precursors of ozone formation, the OTC collaborates to devise impactful yet cost-effective model rules for states to then officially adopt as needed. Additional model rules are typically developed for successive ozone NAAQS, as greater levels of emissions reductions are continuously needed.

To that end, the Department has promulgated a number of regulations for the stationary and area source sectors that have resulted in decreased secondary PM formation. The federal and state measures listed below have generally been implemented since the annual and 24-hour $PM_{2.5}$ NAAQS were finalized. Because these measures have been implemented by the Department as revisions to the SIP, they cannot be repealed or relaxed without equivalent reductions from other source(s) pursuant to the backsliding provisions of the CAA (e.g., section 110(l)).

These control measures typically result in reductions of precursor emissions of PM. In some cases, particularly for RACT regulations, the thresholds at which a source becomes applicable for a rule are lower in the NYMA. Some of these regulations (e.g., Part 205, Subpart 227-2) are periodically updated with more stringent control requirements as control technology improves and/or becomes less costly, and as additional emission reductions are needed. The continued implementation of these control regulations will aid in sustaining the declining concentration trends seen in Figures 7 and 8, and as projected in section III of this document. In addition to these regulations, a recent shift in fossil fuel use to natural gas (due to increased supply and greatly reduced cost) is aiding in PM reductions, mostly due to the negligible SO_2 content of the fuel.

- 6 NYCRR Part 205 – *Architectural and Industrial Maintenance (AIM) Coatings* (latest revision effective 1/1/05)
    - Sets limits on the VOC content of materials defined as architectural coatings and industrial maintenance coatings.
- 6 NYCRR Section 212.10 – *Reasonably Available Control Technology for Major Facilities* (latest revision effective 9/22/94)
    - Although this regulation was not revised since the $PM_{2.5}$ NAAQS were promulgated, it continues to achieve emission reductions as it requires major stationary sources to apply RACT to all emission points of NO_x and VOC.
- 6 NYCRR Part 226 – *Solvent Metal Cleaning Processes* (latest revision effective 5/7/03)
    - This RACT regulation sets guidelines and operating requirements for the cleaning of metal surfaces by VOC-containing substances.
- 6 NYCRR Subpart 227-2 – *Reasonably Available Control Technology (RACT) for Major Facilities of Oxides of Nitrogen (NO_x)* (previous revision effective 2/11/04)
    - Updated the existing subpart 227-2, which contains NO_x emission limits for boilers of various sizes and combustion turbines, with additional/more stringent NO_x limits.

2. Mobile Sources

Mobile sources are a significant source of $PM_{2.5}$ within the NYMA. New York has implemented a series of increasingly stringent control measures that address emissions of $PM_{2.5}$ and its precursors which derive from mobile sources. Inventory data for mobile sources continue to show a downward trend similar to the one demonstrated in the annual $PM_{2.5}$ attainment SIP. These data are presented in Table 7 for the 2007 base-year inventory, and are projected to 2017 and 2025 based on the future-year inventory. (See section III.A for additional inventory data).

Table 7. On-Road Mobile Source Inventories

	2007 Inventory		2017 Projection Inventory		2025 Projection Inventory	
Pollutant	**Tons**	**Percent***	**Tons**	**Percent***	**Tons**	**Percent***
$PM_{2.5}$	6,835.30	26.3%	3,897.71	20.0%	3,291.09	17.3%
SO_2	982.77	1.2%	939.20	1.8%	935.40	1.8%
NO_x	149,501.91	52.0%	68,362.66	36.7%	51,260.81	31.2%

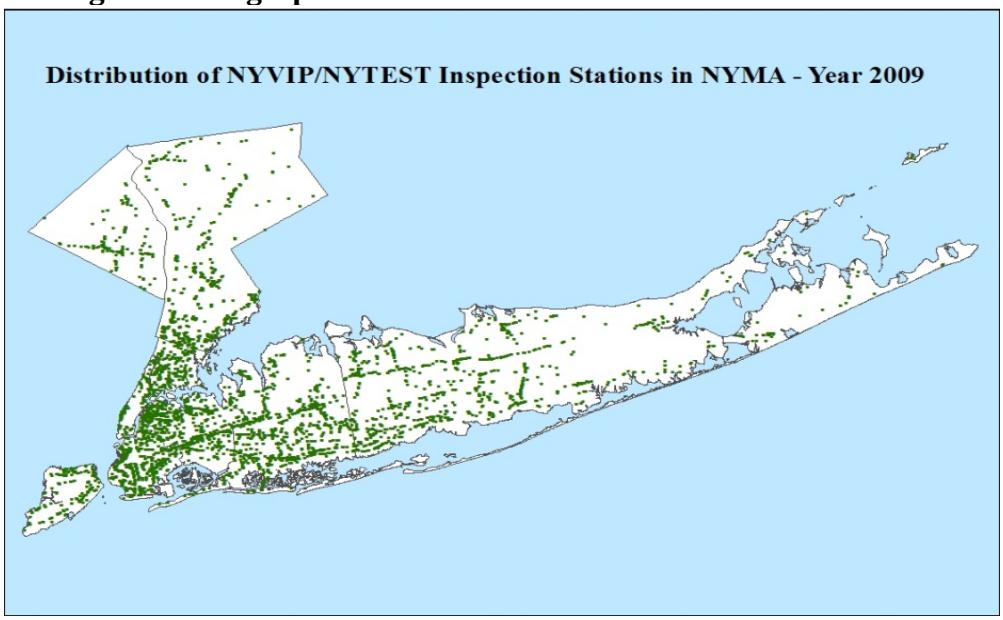
*Percent of entire New York State emissions inventory (not considering Rule Effectiveness)

A key element of the control measures that New York deploys to reduce $PM_{2.5}$ emissions from mobile sources is the Vehicle Inspection and Maintenance (I/M) Program. New York's I/M program (regulated under Subparts 217-1 and 217-4) has been modified over time to reflect state and federal regulatory changes, most notably the implementation of new emission test types (e.g., NYTEST, OBD II). New York's enhanced I/M programs have resulted in the following SIP revisions which further reduced mobile source emissions:

- Enhanced Motor Vehicle Inspection/Maintenance Program (March 1996);
- New York Vehicle Inspection Program – NYVIP (March 2006);
- New York Metropolitan Area Enhanced I/M Program (June 2009).

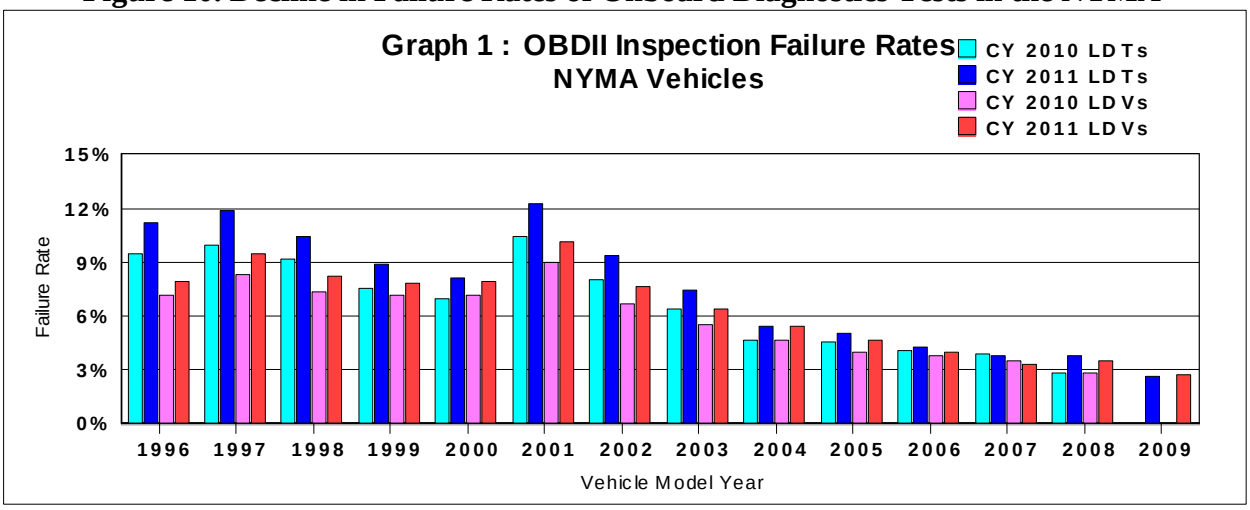
During calendar year 2010, more than 3.34 million light-duty vehicles and trucks received initial Onboard Diagnostics (OBD II) inspections in NYMA from over 3,700 inspection stations. Figure 9 illustrates the geographic distribution of these inspection stations within the NYMA for 2009.

Figure 9. Geographic Location of NYVIP/NYTEST Sites in 2009



The number of vehicles receiving initial OBD II tests in 2010 represented nearly 88 percent of the total emissions-tested fleet within the NYMA. Figure 10 illustrates the steady decline in failure rates for OBD-tested vehicles in the NYMA region from 2001 to 2009.

Figure 10. Decline in Failure Rates of Onboard Diagnostics Tests in the NYMA



An additional 458,000 light-duty vehicles, light-duty trucks, and heavy-duty vehicles received tailpipe initial inspections under the NYTEST program, which represent an increasingly smaller fraction of the emissions-tested fleet, as those vehicles are pre-1996 model-year vehicles not subject to OBD II testing under NYVIP. Light-duty diesel-fueled vehicles, a source of PM, represented only 0.14 percent of the NYMA light-duty vehicle fleet.

In addition to the state I/M program, EPA has led an integrated approach to mobile source emissions control that advances vehicle and engine design while fuels become cleaner and of higher quality. EPA expects emissions to continue their downward trend even as the number of vehicle miles traveled increases. The federal rules that have been adopted or began being phased since the promulgation of the $PM_{2.5}$ NAAQS are listed below:

- Federal *Tier 2 Gasoline Sulfur Program* (effective 4/10/00)
    - Phased in from 2004-2007, and now in full effect, the program requires refiners to meet an annual corporate average gasoline sulfur level of 30 ppm (with no individual batch exceeding 80 ppm). This represents up to a 90 percent reduction in sulfur content from uncontrolled levels.
- Federal *Cleaner Diesel Fuel Program*
    - This program refers to a collection of mobile-source related regulations. Under this program, a 15 ppm ULSD specification was phased in for highway diesel fuel from 2006-2010. Additionally, a low sulfur (500 ppm) and ULSD fuel specification is being phased in for nonroad, locomotive, and marine engines from 2007-2014.
- Federal Rule – *Control of Emissions from Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine and Land-Based)* (effective 1/7/03)
    - A variety of previously unregulated nonroad engines were targeted for NO_x, CO, and hydrocarbon emission reductions with this rulemaking. Various standards went into effect for the different engine types between 2004 and 2007.
- Federal Rule – *Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel* (effective 8/30/04)
    - This rule established NO_x and PM emissions standards for nonroad diesel engines that began being phased-in in 2008. EPA cites sulfur oxide reductions of greater than 99 percent from its nonroad diesel fuel sulfur reductions. These fuel sulfur reductions were implemented with an interim step of 500 ppm in June, 2007, with the final 15 ppm limit in place in June, 2010.

3. Recently Adopted or Revised Control Measures

In addition to the previously established control measures discussed above, there are a number of control measures that were recently adopted or revised as a result of planning for the 1997 annual $PM_{2.5}$ NAAQS, the 1997 8-hour ozone NAAQS, or the Regional Haze program, or which resulted from additional state and federal mandates. The measures summarized below have been adopted by the Department since 2009, when the NYMA first demonstrated attainment with the annual and 24-hour $PM_{2.5}$ NAAQS. Emissions reductions have already been realized by some of these regulations; others will be coming into effect in the approaching years. While some of these regulations do not directly impact the NYMA (e.g., no cement or glass plants regulated

under Part 220 exist within the NYMA boundary), upwind emission reductions still contribute to improving air quality. Collectively, these regulations help ensure New York's continued compliance with the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS.

<u>NO_x:</u>

- 6 NYCRR Section 212.12 – *Hot Mix Asphalt Production Plants* (new; effective 9/30/2010)
    - Introduced requirements for annual burner tune-ups on asphalt plant burners and stockpile moisture control in an effort to reduce the amount of fuel burned and the ensuing NO_x emissions. These requirements were effective in 2011. The regulation also requires an analysis of low-NO_x burner technology for future burner replacements at existing plants, and requires new plants to have low-NO_x burners installed.
- 6 NYCRR Subpart 220-1 – *Portland Cement Plants* (revised; effective 7/11/2010)
    - Requires an updated RACT analysis at portland cement plants (currently two exist in the state). Equipment deemed as RACT was required to be operating by July 1, 2012.
- 6 NYCRR Subpart 220-2 – *Glass Plants* (revised; effective 7/11/2010)
    - Requires a RACT analysis from glass plants (currently four affected in the state). Equipment deemed as RACT was required to be operating by July 1, 2012.
- 6 NYCRR Subpart 227-2 – *Reasonably Available Control Technology (RACT) for Major Facilities of Oxides of Nitrogen (NO_x)* (revised; effective 7/8/2010)
    - Updates the presumptive NOx RACT emission limits for boilers and combustion engines, with a compliance date of July 1, 2014. Also includes a requirement for case-by-case RACT analyses for combined cycle/cogeneration combustion turbines.

<u>VOC</u>

- 6 NYCRR Part 228 – *Surface Coating Processes, Commercial and Industrial Adhesives, Sealants and Primers* (revised; effective 9/30/2010)
    - Achieves VOC reductions through two basic components: sale and manufacture restrictions that limit the VOC content of specified adhesives, sealants and primers sold in New York State; and use restrictions that apply primarily to commercial/industrial applications.
- 6 NYCRR Part 234 – *Graphic Arts* (revised; effective 7/8/2010)
    - Expands the current regulation's applicability to include letterpress printing and establishes more stringent RACT for VOCs for facilities that engage in flexographic, offset lithographic and rotogravure printing.
- 6 NYCRR Part 235 – *Consumer Products* (revised; effective 10/15/2009)
    - Existing regulation was updated to implement additional VOC product content limits.
- 6 NYCRR Part 239 – *Portable Fuel Container Spillage Control* (revised; effective 7/30/2009)
    - Existing regulation was revised with the following changes: eliminate existing automatic shutoff feature, fill height, and flow rate standards; simplify compliance testing requirements; and, require certification of portable fuel containers.

- 6 NYCRR Part 241 – *Asphalt Pavement and Asphalt Based Surface Coating* (new; effective 1/1/2011)
    - Updates the permissible VOC content limits for pavement and surface coatings.

<u>Multiple/Other</u>

- 6 NYCRR Part 249 – *Best Available Retrofit Technology (BART)* (new; effective 5/6/2010)
    - Adopted from a federal program aimed at reducing the impacts of visibility-impairing pollutants in Class I areas. This regulation targets emissions of SO_2, NO_x, and PM_{10} from certain categories of stationary sources which began operation between 1962 and 1977. The Department identified 19 subject facilities in New York State. Facilities are complying through a variety of options including unit shutdown, emission caps, add-on control technology, and process modifications. Compliance is required by January 1, 2014.
- ECL §19-0325 – *Ultra Low Sulfur Heating Oil* (new; effective 7/20/2010)
    - On July 20, 2010, then-Governor David Paterson signed a law mandating lower-sulfur heating fuel in New York State. Specifically, the law required the sulfur content of all oil sold for use in residential, commercial, or industrial heating within the state to be no greater than 15 ppm by July 1, 2012. This decreases the allowable limit from the current range of 2,000 to 15,000 ppm.
- Federal Rule – *Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder* (new; effective 7/7/2008)
    - Consists of a three-part emission control strategy to target PM and NO_x emissions from locomotives and marine diesel engines. These strategies consist of standards for existing engines (beginning 2008), near-term "Tier 3" emission standards for newly-built engines (phased-in beginning 2009), and long-term "Tier 4" emission standards for newly-built engines (phased-in beginning 2014 for marine diesel engines and 2015 for locomotives).

D. Requirements for a Fully Approved Maintenance Plan

Section 175A of the CAA outlines the requirements that must be contained in the SIP for a former nonattainment area, providing for continuing maintenance of the NAAQS. Specifically, this section contains the following requirements:

- A demonstration that compliance with the NAAQS will be maintained for at least 10 years after redesignation;
- Eight years following redesignation, an additional demonstration of compliance with the NAAQS for 10 years after the expiration of the initial 10-year period; and,
- A contingency provision to correct any violations of the standard that might occur after the area is redesignated to attainment.

The complete maintenance plan for the first 10-year period for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS is contained in section III of this document. It contains predicted emission reductions that will be sufficient to maintain the standard through 2025, carrying on the trend of improving ambient concentrations seen in Figures 7 and 8. Section III also contains the

contingency measures the Department expects to go into effect within the next few years, which would further ensure the reduction of $PM_{2.5}$ concentrations for the purpose of maintaining the annual and 24-hour NAAQS.

The Department will be able to demonstrate continued compliance with the 1997 and 2006 $PM_{2.5}$ standards through various means. The air monitor network established in the NYMA (see section II.A.1) will continue to be operated to ensure compliance with the current, and future, NAAQS, and to ensure adequate protection of public health. The Department is required to review the adequacy of its monitoring plan yearly, and submit its findings to EPA in the Annual Monitoring Network Plan.

The Department also develops a statewide emission inventory every three years. These inventories are based on actual emissions data from major stationary sources, calculated emissions from minor stationary sources, and modeled data for mobile sources. Emission inventories allow the Department to determine whether statewide emission levels are adequate, and to identify sectors for further regulation if necessary.

E. Satisfy All Requirements under Section 110 and Part D

1. Section 110

Pursuant to CAA sections 110(a)(1) and (2), states are required to submit an "infrastructure" demonstration showing that New York's air program addresses basic SIP requirements related to the attainment of new or revised NAAQS, including emission inventories, monitoring and modeling to assure attainment, maintenance, and enforcement of the standards. Section 110(a)(1) contains the general requirements for submitting a SIP after promulgation of a new or revised NAAQS. Section 110(a)(2) contains specific elements to be included in these plans.

States are also required to submit a "transport SIP" under section 110(a)(2)(D)(i). This section of the CAA requires states to demonstrate that the interstate transport of a criteria pollutant does not contribute significantly to nonattainment in, nor interfere with maintenance by, any other state with respect to a NAAQS, or interfere with measures required to be included in the applicable implementation plan for any other state to prevent significant deterioration of air quality or to protect visibility.

In March, 2010 the Department submitted to EPA a joint infrastructure demonstration and transport SIP to satisfy these section 110 requirements for the 2006 24-hour $PM_{2.5}$ NAAQS. The Department believes the submission satisfies each of the requirements of section 110. It is understood that EPA must approve these required SIP elements before the NYMA redesignation can be granted. The infrastructure elements addressed by the plan are as follows:

- 110(a)(2)(A): Enforceable emission limitations and other control measures
- 110(a)(2)(B): Ambient air quality monitoring, compilation, analysis and reporting
- 110(a)(2)(C): Enforcement and stationary source permitting
- 110(a)(2)(D): Interstate transport
- 110(a)(2)(E): Assurance of adequate resources
- 110(a)(2)(F): Stationary source monitoring system and reporting

- 110(a)(2)(G): Emergency powers and contingency plans
- 110(a)(2)(H): Authority for SIP revisions for revised NAAQS
- 110(a)(2)(I): Authority for SIP revisions for new nonattainment areas
- 110(a)(2)(J): Consultation, public notification and prevention of significant deterioration (PSD) and visibility
- 110(a)(2)(K): Air quality monitoring and reporting
- 110(a)(2)(L): Permitting fees
- 110(a)(2)(M): Consultation/participation with affected local entities

On July 20, 2011, EPA issued a final disapproval of New York's transport SIP component for the 2006 24-hour NAAQS—specifically section 110(a)(2)(D)(i)(I).[12,13] EPA disapproved New York's transport SIP because it relied on the CAIR trading program to resolve the state's transport obligations. EPA stated that this was problematic for two reasons: First, CAIR was designed to address the 1997 annual $PM_{2.5}$ NAAQS, not the 2006 24-hour standard. Second, because CAIR was later remanded to EPA by the U.S. Court of Appeals for "more than several fatal flaws,"[14] states are not able to permanently rely upon the emission reductions expected under CAIR.

New York State has enacted a number of control programs for PM and its precursors, as shown in section II.C. Additional control programs, as listed in section III.D, will continue to lessen $PM_{2.5}$ concentrations in the NYMA and downwind areas. While these actions were primarily taken to reduce in-state emissions, they also effect improvements in downwind areas.

A technical support document for EPA's Cross-State Air Pollution Rule (CSAPR) cited two areas in which New York State significantly contributes to nonattainment for the 1997 annual $PM_{2.5}$ NAAQS (Cuyahoga Co., OH and Allegheny Co., PA), and four areas in which the state significantly contributes to nonattainment for the 2006 24-hr $PM_{2.5}$ NAAQS (St. Clair Co., MI; Wayne Co., MI; Cuyahoga Co., OH; and Lancaster Co., PA).[15] Of these areas, all but Allegheny Co., PA are now in attainment, based on 2009-2011 monitoring data available through EPA's AirData website. Furthermore, EPA's CSAPR proposal notes that "EPA believes that the monitor in Allegheny County that remains in nonattainment is in an area where the air quality problem is primarily local."[16] This is evidence that, even without an updated trading rule for interstate pollution in place, New York State has successfully ameliorated its impacts to downwind states and fulfilled its obligations under section 110(a)(2)(D).

On November 19, 2012, EPA released guidance regarding how it intends to handle various SIP-related actions that were affected by the court decision which vacated CSAPR.[17] In this memo, EPA states that continuing to rely on CAIR emission reductions as permanent and enforceable is

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[12] **Federal Register** / Vol. 76, No. 139, p. 43153; published July 20, 2011
[13] Action was not taken on section 110(a)(2)(D)(i)(II), nor the associated infrastructure demonstration at that time.
[14] State of North Carolina v. EPA, U.S. Court of Appeals for the D.C. Circuit, decided July 11, 2008, p.4
[15] "Air Quality Modeling Final Rule Technical Support Document," EPA, 2011, Appendix D–2012 Base Case State-by-State Contributions to Nonattainment and Maintenance for 8-Hour Ozone, Annual $PM_{2.5}$, and 24-Hour $PM_{2.5}$
[16] **Federal Register** / Vol. 75, No. 147, p.45281; published August 2, 2010
[17] "Next Steps for Pending Redesignation Requests and State Implementation Plan Actions Affected by the Recent Court Decision Vacating the 2011 Cross-State Air Pollution Rule"; November 19, 2012, Gina McCarthy (Assistant Administrator) to Regional Air Directors

appropriate until either the CSAPR decision is overturned, or a valid replacement rule is finalized and associated implementation plans are developed by states and approved by EPA. EPA action on this redesignation request and maintenance plan may therefore proceed despite EPA's prior disapproval of section 110(a)(2)(D)(i)(I) of New York's transport SIP for the 24-hour $PM_{2.5}$ NAAQS.

2. Part D

Part D of the CAA contains general SIP requirements that are applicable to all nonattainment areas (Subpart 1), as well as SIP requirements that pertain to nonattainment areas for specific pollutants (Subparts 2 through 5). Subpart 4 of Part D consists of the specific requirements for particulate matter. A January 4, 2013 decision from the D.C. Circuit Court of Appeals found that EPA had been erroneously applying Subpart 1 provisions for $PM_{2.5}$-related implementation issues. This document adheres to the D.C. Circuit Court's finding that Subpart 4 governs implementation of $PM_{2.5}$. This document therefore addresses the requirements of Subpart 4, including the consideration of ammonia as a potential precursor to $PM_{2.5}$.

The Department is in compliance with the additional general requirements of Subpart 1 of Part D. CAA section 175A pertains to maintenance plans for areas that seek redesignation to attainment; this document fulfills the requirement of section 175A(a) of a SIP revision providing for maintenance of the standards for at least 10 years. Pursuant to section 175A(b), The Department is committing to submit, within eight years of redesignation, a SIP revision to provide for maintenance of these NAAQS for a subsequent 10 year period. Contingency measures pursuant to CAA section 175A(d) are listed in section III.D.

III. MAINTENANCE PLAN FOR 1997 ANNUAL AND 2006 24-HR $PM_{2.5}$ NAAQS

A. Emissions Inventory

The Department has prepared a series of inventories to demonstrate the emission trends that are projected to occur under current and expected regulatory programs.[18] The base year for this redesignation request is 2007, which represents an actual attainment year inventory and includes actual emissions from stationary sources (adjusted for rule-effectiveness) based on their submission of emissions statements, as well as estimates of area source and mobile source emissions. Because CAA section 175A requires that states "provide for the maintenance of the [NAAQS]…for at least 10 years after the redesignation," 2025 was chosen as the projection year. The Department also selected 2017 as an interim projection year as required by recent EPA guidance.[19]

[18] Summarized inventory data are presented in this section. Full inventory data will be submitted to EPA electronically. These data are also available upon request.

[19] "Implementation Guidance for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)"; March 2, 2012, Steven D. Page (Director, Office of Air Quality Planning) to Regional Air Directors

The inventories that have been developed support the fact that the NYMA will continue to demonstrate attainment with the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS. Because the area is currently achieving these standards and emissions are projected to decrease further, it stands to reason that continued attainment can be assured. Furthermore, EPA finalized revisions to the $PM_{2.5}$ NAAQS on December 14, 2012 (specifically, a lowering of the level of the annual standard to 12 $\mu g/m^3$), which will potentially call for additional regulatory programs if the NYMA is designated as nonattainment by EPA. Continued attainment may also be a function of upwind states' responsibilities to control emissions: should states such as Pennsylvania and Ohio continue to reduce their emissions of $PM_{2.5}$ and precursors, maintenance in the NYMA will be further assured.

Tables 8 through 10 summarize the emissions for the 10 New York counties in the NYMA. Summary tables are provided for the 2007 base year, 2017 interim projection year, and 2025 projection year. Figure 11 displays graphically the projected reductions in PM and PM precursor emissions, while Tables 11 through 13 summarize the inventory by source sector. These tables include stationary source actual emissions and their projections, as well as emissions adjusted for rule-effectiveness.[20]

[20] The elevated $PM_{2.5}$ values for Orange County in Tables 8 through 10, as well as the large discrepancy between $PM_{2.5}$ totals in Tables 11 through 13, are the direct result of the application of an 80 percent rule-effectiveness value to three highly controlled particulate sources in Orange County.

Table 8. 2007 Base Year Inventory by County with RE (Tons)

County	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Bronx	15,047.66	16,072.26	63,427.45	2,973.86	1,296.29	2,028.00	273.71
Kings	28,662.51	29,076.44	124,999.42	4,799.25	2,383.33	4,181.63	433.64
Nassau	31,927.15	38,757.58	237,855.45	7,698.63	3,244.15	4,161.52	891.06
New York	24,969.47	38,674.46	156,401.62	7,897.92	3,256.44	8,379.15	573.40
Orange	10,047.89	16,401.52	74,321.45	10,299.57	120,451.70	17,457.67	1,258.36
Queens	31,752.34	49,624.79	182,710.39	7,142.92	3,331.36	7,175.21	766.23
Richmond	7,991.66	11,116.46	50,837.44	2,353.33	892.64	1,348.56	164.63
Rockland	6,773.37	10,861.11	50,646.73	2,298.98	5,254.22	8,090.90	333.66
Suffolk	44,149.39	53,819.10	309,309.17	13,763.17	5,630.24	23,161.04	1,142.61
Westchester	21,273.64	24,706.33	160,065.09	9,410.87	2,540.15	4,451.51	572.77
Total	**222,595.08**	**289,110.05**	**1,410,574.21**	**68,638.51**	**148,280.52**	**80,435.19**	**6,410.08**

Table 9. 2017 Interim Projection Year Inventory by County with RE (Tons)

County	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Bronx	12,112.80	9,460.93	39,905.03	2,382.79	924.91	570.10	195.23
Kings	22,317.71	17,925.67	78,895.41	3,694.19	1,722.45	1,876.27	298.05
Nassau	20,334.10	21,576.11	146,367.91	6,069.83	2,350.01	1,209.10	616.41
New York	17,709.12	25,740.64	112,483.64	6,338.66	2,446.43	3,964.15	445.78
Orange	7,217.53	11,847.65	47,941.66	5,263.63	119,826.95	15,718.83	1,208.67
Queens	23,583.06	34,838.52	113,502.89	5,649.71	2,461.80	5,085.91	573.19
Richmond	6,397.10	7,768.51	34,455.91	2,123.65	733.59	1,053.11	130.43
Rockland	4,527.46	7,633.39	34,380.00	1,515.25	4,434.51	7,312.84	288.18
Suffolk	28,745.40	35,245.65	214,435.45	12,638.31	4,821.86	15,478.61	939.13
Westchester	14,470.39	15,229.93	108,921.41	4,996.79	1,632.78	779.24	429.61
Tappan Zee Project	N/A	457.00	N/A	N/A	N/A	N/A	N/A
Total	**157,414.67**	**187,724.00**	**931,289.32**	**50,672.82**	**141,355.28**	**53,048.17**	**5,124.68**

Table 10. 2025 Projection Year Inventory by County with RE (Tons)

County	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Bronx	12,001.94	7,843.65	39,228.79	2,437.95	853.18	563.84	196.75
Kings	21,890.14	15,315.75	78,139.60	3,716.69	1,581.36	1,915.10	291.83
Nassau	18,782.44	18,286.53	146,242.98	6,493.00	2,308.79	1,235.89	622.02
New York	17,331.41	22,496.16	118,659.27	6,719.35	2,291.81	3,986.13	446.83
Orange	6,830.76	10,860.76	48,138.05	5,374.59	119,815.34	15,712.22	1,239.75
Queens	23,319.79	33,134.26	113,218.21	6,011.59	2,364.83	5,288.51	574.26
Richmond	6,391.30	7,085.86	35,661.72	2,468.27	768.78	1,113.59	139.63
Rockland	4,243.68	7,059.19	35,786.47	1,573.17	4,425.59	7,316.57	295.83
Suffolk	26,051.63	31,473.05	220,845.67	13,869.88	4,948.16	15,578.36	989.56
Westchester	13,657.59	13,592.12	113,243.94	5,259.37	1,605.61	810.39	445.12
Total	**150,500.68**	**167,147.34**	**949,164.70**	**53,923.85**	**140,963.45**	**53,520.61**	**5,241.57**

Figure 11. Projected Emission Trends of PM and PM Precursors Through 2025

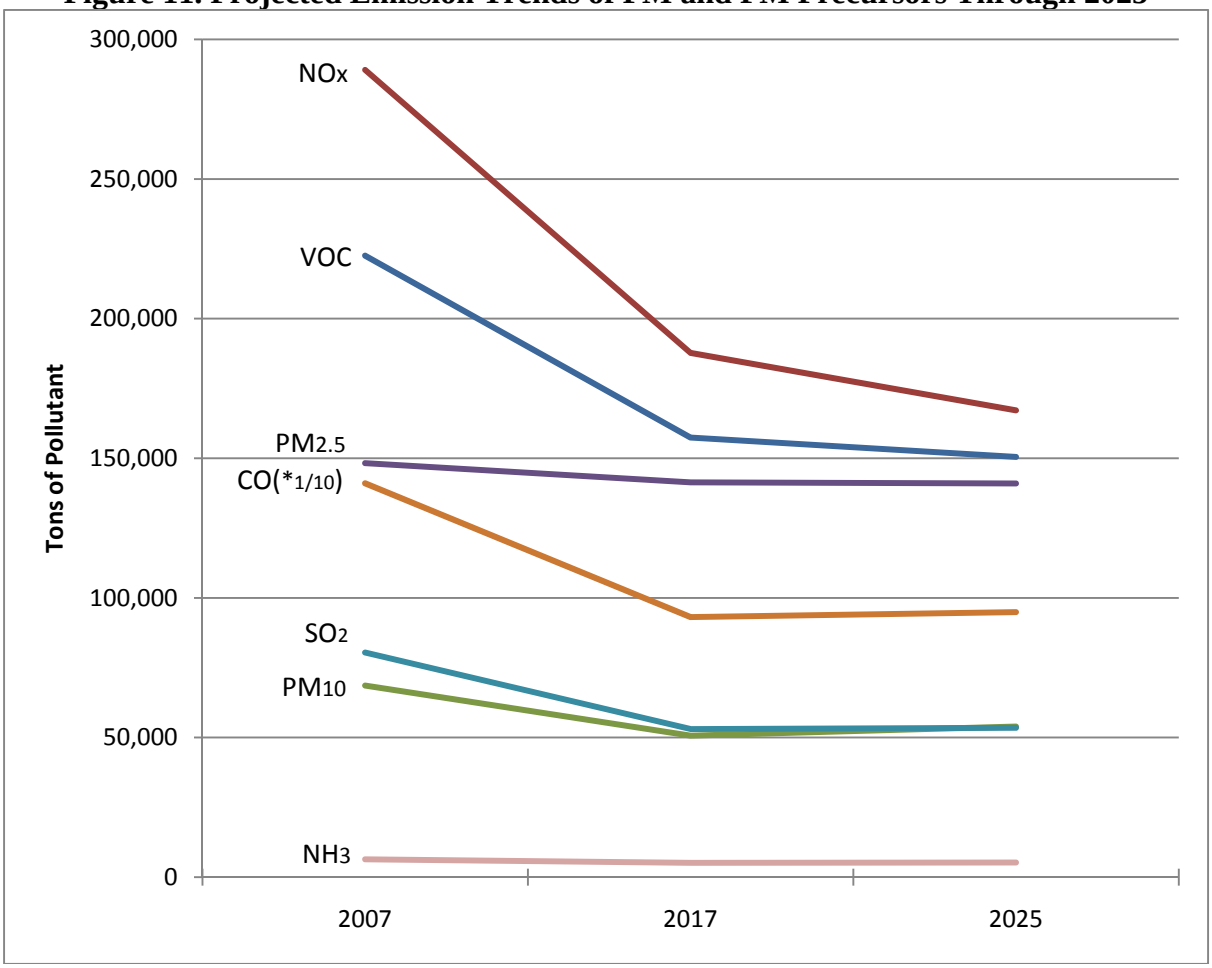

Table 11. 2007 Base Year Inventory by Source Sector (Tons)

Sector	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Point	3,269.78	36,829.68	12,013.83	2,913.32	2,435.34	43,886.32	862.89
Point w/RE	3,707.01	38,195.94	13,137.41	3,206.28	124,750.31	43,886.32	862.89
Nonpoint	101,481.89	41,899.74	23,211.41	48,054.84	11,621.00	29,513.22	1,960.83
Nonroad	46,026.72	59,512.46	474,292.00	4,170.45	3,899.30	6,052.88	1.96
On-road	71,379.46	149,501.91	899,933.39	9,723.36	6,835.30	982.77	3,584.40
Road Dust	N/A	N/A	N/A	3,483.59	1,174.60	N/A	N/A
Total	**222,157.85**	**287,743.79**	**1,409,450.63**	**68,345.56**	**25,965.55**	**80,435.19**	**6,410.08**
Total w/RE	**222,595.08**	**289,110.05**	**1,410,574.21**	**68,638.51**	**148,280.52**	**80,435.19**	**6,410.08**

Table 12. 2017 Interim Projection Year Inventory by Source Sector (Tons)

Sector	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Point	3,242.86	35,729.48	12,269.28	2,882.25	2,417.29	43,484.27	867.60
Point w/RE	4,131.72	37,066.75	13,730.42	3,193.99	124,290.57	43,484.29	867.60
Nonpoint	93,790.95	36,640.38	22,438.48	34,306.76	9,403.95	4,412.25	1,915.00
Nonroad	26,408.16	45,197.21	392,576.80	3,040.77	2,809.06	4,212.42	1.12
On-road	33,083.83	68,362.66	502,543.63	7,171.83	3,897.71	939.20	2,340.95
Road Dust	N/A	N/A	N/A	2,959.46	954.01	N/A	N/A
Tappan Zee Project	N/A	457.00	N/A	N/A	N/A	N/A	N/A
Total	**156,525.80**	**186,386.73**	**929,828.18**	**50,361.08**	**19,482.01**	**53,048.15**	**5,124.68**
Total w/RE	**157,414.67**	**187,724.00**	**931,289.32**	**50,672.82**	**141,355.28**	**53,048.17**	**5,124.68**

Table 13. 2025 Projection Year Inventory by Source Sector (Tons)

Sector	VOC	NO_x	CO	PM_{10}	$PM_{2.5}$	SO_2	NH_3
Point	3,261.75	36,306.85	12,455.94	2,889.47	2,423.51	43,591.03	872.33
Point w/RE	4,153.64	37,645.59	13,929.75	3,201.53	124,294.66	43,596.39	872.33
Nonpoint	94,698.56	35,467.73	22,764.61	38,066.67	10,126.70	4,389.48	1,924.66
Nonroad	24,737.31	42,773.21	430,459.94	2,519.12	2,290.95	4,599.34	1.05
On-road	26,911.17	51,260.81	482,010.40	6,952.22	3,291.09	935.40	2,443.53
Road Dust	N/A	N/A	N/A	3,184.31	960.05	N/A	N/A
Total	**149,608.78**	**165,808.60**	**947,690.89**	**53,611.79**	**19,092.30**	**53,515.25**	**5,241.57**
Total w/RE	**150,500.68**	**167,147.34**	**949,164.70**	**53,923.85**	**140,963.45**	**53,520.61**	**5,241.57**

B. Inventory Methodology

1. On-Road Inventory

a. On-Road Methodology for Base Year 2007

The on-road component of the 2007 base year inventory includes an estimate of emissions from all motorized vehicles operated on public roadways. All on-road mobile source emissions were estimated using EPA's Motor Vehicle Emissions Simulator (MOVES) model using locally-developed inputs for each of the 62 New York counties. These inputs include varying meteorological data, vehicle activity, fuel characteristics, and emissions control programs.

"Base-year" inventory inputs were derived from 2007 data, where applicable, and reflect the programs and controls that were in effect in 2007. Once all inputs were developed, the Department modeled the inventory, whether annual and/or daily, in accordance with EPA's guidance "*Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b" (EPA-420-B-12-028, April 2012*). More detailed descriptions of the Department's methodologies for developing MOVES-specific inputs can be found in Appendix D – *New York State On-Road Motor Vehicle Emission Budget MOVES Technical Support Documentation.*

b. On-Road Projection Methodology

New York State is modeled using county-specific inputs for meteorology, vehicle activity and population, fuel formulation data, and I/M program information. The on-road mobile source projection inventory was developed by using MOVES with vehicle mile travelled (VMT) and vehicle population projections for each future inventory year based on a linear regression of Highway Performance Monitoring System (HPMS) historical data for forecasting VMT prepared by the NYSDOT. These projections employed HPMS data from 1981 to 2007. MOVES is then run to produce emissions for each vehicle and road type combination for all required counties.

c. On-Road Mobile Source Emissions and Re-entrained Road Dust

The Department has included road dust estimates as part of this SIP submission. This inventory was developed as part of our SIP modeling inventory and the methodology is contained in Appendix E - *Road Dust Estimation for Paved and Unpaved Roads*. For the more rural counties (i.e., Nassau, Orange, Rockland, Suffolk and Westchester), speciated monitoring indicates that road dust emissions represent approximately 3.3 percent of the total mass. The Department has adjusted the calculated road dust emissions estimates for these counties so that they represent 3.3 percent of the total mass from the monitoring results. The Department also adjusted Bronx, Kings, New York, Queens and Richmond Counties to 5.0 percent to more closely represent speciated monitoring at an urban monitor.

The Department believes that the values estimated using EPA's preferred methodology are inaccurate for inclusion in the SIP.[21] For the purposes of this submission, the Department has included an adjusted road dust inventory based on speciated monitoring.

The speciated monitoring data shows that the fraction known as the "crustal fraction" can be subtotaled yielding 3 to 5 percent of the $PM_{2.5}$ total mass on filters collected in the NYMA

[21] This methodology is outlined in AP-42, Chapter 13, §13.2.1 for paved roads and §13.2.2 for unpaved roads.

nonattainment area. This crustal fraction is a measure of particulate from any geological origin, not just from road dust (i.e. sand and gravel operations and their transportation, residential, commercial or roadway construction and demolition including trackout, other forms of trackout, waste transfer processes, fugitive dusts from roadway accidents and spillage, etc.).

Original emissions (as contrasted to the re-entrained portions) are considered by the Department to minimally include brake wear, tire wear, and pavement wear. A case can be made that only pavement wear is road dust, but such estimates are indeterminate as well. Furthermore, for accounting purposes in this plan, tire wear (TW) and brake wear (BW) estimates are included as part of the on-road sector for fine PM. They are included in the $PM_{2.5}$ estimates made for the on-road mobile sources, together with exhaust gas PM (GASPM), organic (O_CARBON) and elemental (E_CARBON) carbon estimates.

Therefore, for purposes of conformity, tire and brake wear $PM_{2.5}$ emissions are included in the conformity budget, presented in section III.C.3. The percent contribution (shown above) of each of these subcategories of $PM_{2.5}$ is approximately the same whether it is for the 10-county NYMA nonattainment area or for a 62-county statewide inventory.

2. Nonroad Inventory

a. Nonroad Methodology for Base Year 2007

Nonroad mobile source emissions are separated by four main categories: aircraft, commercial marine vessels, locomotives, and "other." "Other" nonroad equipment is further broken down into several sub-categories of equipment and vehicles. These include agricultural, commercial, construction and mining, industrial, lawn and garden, logging, pleasure craft, and recreational. Emissions for all sectors were estimated using four separate methodologies. Nonroad emissions for 2007 are estimated for all 62 New York counties. In addition, New York is separated into two areas due to the federally mandated Reformulated Gas (RFG) Program.

The sub-categories of "other" nonroad equipment are separated by 2-stroke gasoline, 4-stroke gasoline, liquefied petroleum gas (LPG), compressed natural gas (CNG), and diesel-fueled engine types. All emissions from these sources for 2007 were estimated using version 2008a of the EPA Nonroad Model. The software was finalized for use in SIP development on June 12, 2006. Using the EPA Nonroad Model, nonroad emissions from New York were estimated for each individual county for each month of the year. Temperature and fuels blend data varied by month for each county across the state.

Temperature data for 2007 was acquired from the National Oceanic and Atmospheric Administration which included historical weather data from 33 airport locations across New York State as well as surrounding locations. This information was used to develop average high and low temperatures for each month on a county-by-county basis. The results were inputted to the Nonroad Model.

Gasoline and diesel fuels blend data for 2007 were acquired from the New York State Department of Agriculture and Markets. These data are based on thousands of samples collected across the state from fueling stations and retention areas. These samples are then analyzed for many profiles including oxygen content, Reid Vapor Pressure (RVP), and sulfur content. The

data provided average monthly fuels profiles on a county-by-county basis. The results were inputted to the Nonroad Model.

Aircraft emissions for New York State in 2007 were estimated using the Federal Aviation Administration's (FAA) Emission Dispersion Modeling System (EDMS) Version 5.1. Airport-specific landing and take-off (LTO) data by aircraft type acquired from FAA are used as inputs to the model. EDMS uses this information to estimate from both aircraft and ground service equipment.

Commercial Marine Vessel (CMV) emissions for 2007 are based on version 2 of the 2008 National Emission Inventory (NEI). The NEI emissions from Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk and Westchester Counties are built off of the CMV emissions report prepared by the Starcrest Consulting Group in conjunction with their work on the New York Harbor Deepening Project. This emissions report was undertaken as part of the Harbor Deepening Project to update the baseline inventory and to optimize the offsets that would be utilized by the Army Corps of Engineers. These data are based on actual 2002 operational data from an intensive survey of all CMV types, activity, and fuel consumption, and took several months to complete. While the Department would like to use the Starcrest methodology to update the CMV inventory for the rest of the state, it would require an intensive effort to survey all of the counties bordering Lake Erie, Niagara River, Lake Ontario, the St. Lawrence Seaway, Lake Champlain, Hudson River, Mohawk River, Erie Canal, and both the Long Island Sound and Atlantic Ocean since Suffolk County was not included in the Starcrest inventory. The detailed CMV emissions inventory methodology can be found in the EPA document entitled "*Documentation for Aircraft, Commercial Marine Vessel, Locomotive, and Other Components of the National Emissions Inventory – Volume I – Methodology*."[22]

Locomotive emissions for 2007 are based on version 2 of the 2008 NEI. These emissions were derived from a locomotive emissions report developed by the New York State Energy Research and Development Authority (NYSERDA) in conjunction with the Department. The report is entitled "*NYSERDA Clean Diesel Technology: Non-Road Field Demonstration Program; Development of the 2002 Locomotive Survey & Inventory for New York State*." The report included an intensive survey of all locomotive activity throughout New York State.

b. Nonroad Projection Methodology

All 2017 and 2025 emissions from "other" nonroad equipment (which include 2-stroke gasoline, 4-stroke gasoline, LPG, CNG, and diesel fueled non-road vehicles, as well as emissions from recreational marine vessels) were estimated using version 2008a of the EPA Nonroad Model. When completing future year projections, the model incorporates emissions effects that result from both anticipated changes in equipment activity as well as deterioration of equipment. The model also accounts for expected turnover of old equipment. In addition, the following EPA nonroad emission control programs are built into the model:

- New Phase 2 Standards for Small Spark-Ignition Non-Handheld Engines (March 1999) which covers NO_x and hydrocarbon reductions from mowers, edgers, lawn tractors, and other non-handheld gasoline equipment.

[22] Available at ftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002nei_mobile_nonroad_methods.pdf

- Final Phase 2 Standards for Small Spark-Ignition Handheld Engines (March 2000) which covers NO_x and hydrocarbon reductions from trimmers, leaf blowers, chain saws, and other handheld gasoline equipment.
- Emission Standards for New Non-Road Engines (September 2002) which covers NO_x, hydrocarbons, and CO from the following new engines and vehicles:
    - Large Industrial Spark-Ignition Engines (forklifts, electric generators, airport baggage tow trucks, etc.);
    - Recreational Vehicles (snowmobiles, dirt-bikes, ATVs);
    - Recreational Diesel Marine Engines (for use in yachts and cruisers).
- Clean Air Nonroad Diesel Rule (May 2004) which covers NO_x, PM and oxide of sulfur (SO_x) emissions from diesel engines used in most construction, agricultural, industrial, and airport equipment. In addition, this rule includes and requires a 99 percent reduction in diesel sulfur by 2010.

Aircraft, commercial marine vessel, and locomotive emissions for 2007 were grown to 2017 and 2025 using growth factors developed by the Mid-Atlantic Regional Air Management Association, Inc. (MARAMA). Details of how these growth factors were derived can be found in the MARAMA report entitled "*Growth/Control Factors and Emission Projections for MAR Categories*" (August 16, 2010). The subsections below summarize the MARAMA report:

i. Aircraft Growth Factors

Aircraft operations were projected to future years by applying activity growth using LTO data at airports. Projections came from data available from the FAA's Terminal Area Forecast System for 2009-2030.[23] This information is available for approximately 3,300 individual airports. Actual LTOs are reported for 2007 and projected LTOs are provided for all years up to 2030. The data were aggregated and applied to the airport and county level for each of the four available operation types: commercial, general, air taxi, and military.

ii. Commercial Marine Vessel Growth Factors

For Category 1 and 2 diesel vessels, EPA used projection data for domestic shipping from the Energy Information Administration (EIA) Annual Energy Outlook 2006 (AEO2006).[24] The annual growth rate reported in the RIA is 0.9 percent; the annual growth rate for energy use for passenger rail is 1.2 percent; and the annual growth rate for domestic shipping is 0.5 percent. A passenger rail annual growth rate of 0.5 percent was used for CMV port emissions (SCC 22-80-002-100) and CMV underway emissions (SCC 22-80-002-200).

iii. Railroad Growth Factors

EPA again used projection data from the AEO2006. Table A-7 of AEO2006 showed that freight rail energy use will grow 1.6 percent annually. There are separate growth factors for passenger rail and freight rail energy use. The annual growth rate for energy use for passenger rail is 1.2 percent; the annual growth rate for energy use for freight rail is 0.7 percent. A passenger rail annual growth rate of 1.2 percent for inter-city passenger train locomotives (SCC 22-85-002-008) and independent commuter rail systems (SCC 22-85-002-009) was used. The freight rail

[23] http://www.apo.data.faa.gov/main/taf.asp
[24] http://www.eia.doe.gov/oiaf/archive/aeo06/pdf/0383(2006).pdf

annual growth rate was 0.7 percent for Class I line haul (SCC 22-85-002-006), Class II/III line haul (SCC 22-85-002-007), and yard switch (SCC 22-85-002-010) locomotives.

c. QA/QC for Nonroad Inventory

Quality assurance (QA) is the systematic measurement, comparison with a standard, monitoring of processes, and an associated feedback loop that confers error prevention. Assuring that the Nonroad Model and EDMS model inputs are accurate should eliminate most mistakes. Therefore, the majority of QA for nonroad inventory development includes management of the model inputs. Through collaboration with the Department of Agriculture and Markets, the National Oceanic and Atmospheric Administration, and the FAA, accurate Nonroad model and EDMS model inputs are developed. The Department receives additional QA of model inputs by sharing information with our partners, such as EPA, MARAMA, and other states. Through this process the Department receives feedback that is used to make any necessary adjustments to the model inputs.

QA can be contrasted with Quality Control (QC) which is focused on process outputs. In developing the nonroad inventory through the Nonroad and EDMS models, Department staff, along with their many partners, relied on inspection of the completed inventories to ensure alignment with expected outcomes. For this effort multiple iterations of the inventory were developed, and minor adjustments were made based on output inconsistencies found through comparison of the Department's data with the EPA-developed state inventories. In some instances this output QC resulted in changes to the input, in how the model was run, and in adjustments to post-processing scripts, all of which resulted in a better quality inventory.

While there are levels of uncertainty associated with every component in an inventory, the Department believes that applying QA/QC procedures throughout every step of the process results in the development of the best inventory possible. The Department further believes that by inspecting both the inputs to the model and the inventory outputs, and by sharing both during inventory development, we are constantly able to improve our emissions results. For two sectors of the inventory—CMV and locomotive—the Department accepted EPA values. Here we relied heavily on the QA/QC undertaken by EPA in the development of those inventories.

3. Nonpoint Source Inventory

For nonpoint source emissions, including those for ammonia, the Department referenced a series of technical support documents (TSD) that were prepared for MARAMA, which are attached to this document as the following appendices:

- Appendix F – *Technical Support Document for the Development of the 2007 Emission Inventory for Regional Air Quality Modeling in the Northeast/Mid-Atlantic Region; ver. 3.3; January 23, 2012*
- Appendix G – *Technical Support Document for the Development of the 2017/2020 Emission Inventories for Regional Air Quality Modeling in the Northeast/Mid-Atlantic Region; ver. 3.3; January 23, 2012*
- Appendix H – *Technical Support Document for the Development of the 2025 Emission Inventory for PM Nonattainment Counties in the MANE-VU Region; ver. 3.3, rev. 2; January 23, 2012*

These documents explain the data sources, methods, and results for preparing emission projections for 2017 and 2025 for PM nonattainment areas in the Mid-Atlantic/Northeast Visibility Union (MANE-VU) region. The MANE-VU region includes Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Virginia is not included in the MANE-VU region, though several cities and counties in northern Virginia were included in this inventory as they are part of a nonattainment area that includes MANE-VU jurisdictions.

The Department has provided representative calculations of nonpoint sources in Appendix I – *Nonpoint Source Emissions Sample Calculations*. These sample calculations are provided for various source sectors to demonstrate the data sources and equations involved.

4. Point Source Inventory

The point source inventory, including EGUs as well as sources of ammonia, was also developed with the MANE-VU states. The methodology is described in the MARAMA TSDs listed previously (i.e., Appendices F through H). The Department used the compiled data and applied rule effectiveness per the method outlined in EPA guidance.[25]

It is acknowledged that point sources do not always run all controls at all times. To account for this, the Department has adopted the EPA recommendation in the use of rule effectiveness (RE). EPA guidance from 2005 was used to generate RE values for point sources within New York State. Once an RE value was calculated, it was applied to all relevant sources at the process level. When RE is applied, the result is increased emission estimates reflecting less than 100 percent compliance. The formulas below were adopted from the 2005 guidance, and illustrate how the application of RE will increase emissions values significantly for those processes that do not have an RE value of 100 percent:

RE Data Example #1

NAP - KENT AVENUE FACILITY, DEC ID: 2610100016
Process ID: P02FP
Pollutant: VOC
Control Type: INCINERATOR AFTERBURNER
Control Efficiency: 90%
Rule Effectiveness: 80%
Reported 2007 Emissions: 75.115 tons

Calculate uncontrolled emissions:

$$Uncontrolled\ emissions = \frac{controlled\ emissions}{(1 - control\ efficiency)}$$

[25] "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter for National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations"; EPA, August 2005.

$$Uncontrolled\ emissions = \frac{75.115\ tons}{(1 - 0.90)} = 751.15\ tons$$

Controlled emissions incorporating rule effectiveness:

$$Uncontrolled\ emissions\ \times\ [1 - (control\ efficiency\ \times RE)] = controlled\ emissions$$

$$751.15\ tons\ \times\ [1 -\ (0.90\ \times 0.80)]\ =\ 210.32\ tons$$

RE Data Example #2

R G E RUSSELL STATION, DEC ID: 8262800068
Process ID: CR4FP
Pollutant: $PM_{2.5}$
Control Type: Electrostatic Precipitator
Control Efficiency: 97.5%
Rule Effectiveness: 90%
Reported 2007 Emissions: 29.27 tons

Calculate uncontrolled emissions:

$$Uncontrolled\ emissions = \frac{controlled\ emissions}{(1 - control\ efficiency)}$$

$$Uncontrolled\ emissions = \frac{29.27\ tons}{(1 - 0.975)} = 1170.8\ tons$$

Controlled emissions incorporating rule effectiveness:

$$Uncontrolled\ emissions\ \times\ [1 - (control\ efficiency\ \times RE)] = controlled\ emissions$$

$$1170.8\ tons\ \times\ [1 -\ (0.975\ \times 0.90)]\ =\ 143.42\ tons$$

RE was generally applied to all processes where a control device or technique was used. However, the Department did consider the limitations which are presented when a blanket RE is applied absolutely. This was also discussed in EPA's 2005 guidance (cited above):

> *…[N]ot all emission estimated involving use of a control device or technique need to be adjusted to account for RE. In some instances, a state or local agency may conclude that a control device that operated in conjunction with a continuous emissions monitor, or is equipped with an automatic shutdown device, may provide a sufficient level of assurance that intended emission reductions will be achieved, and therefore an adjustment for rule effectiveness is not necessary.*

Another example would be in instances where a direct determination of emissions, such as via a mass balance calculation, can be made (US EPA, 2005, B-3).

To determine RE for point sources, the Department utilized criteria given in EPA guidance tailored to New York's facilities and rules. A rule effectiveness matrix (Table 14) was developed and several criteria were evaluated to give an RE percentage to each appropriate process.

Table 14. NYSDEC Rule Effectiveness Matrix

NYSDEC Compliance Factors Considered	Rule Effectiveness
1. Source specific monitoring used for compliance 2. Records filed at least every 4 months 3. Compliant for at least 8 quarters 4. High accuracy compliance test methods are utilized 5. NYSDEC has the authority to impose punitive measures 6. Operators follow daily O&M instructions 7. Subject to Title V (or other) compliance certification 8. Subject to inspection once every 2 years or more frequently	100%
1. Source specific monitoring used as indicator of compliance 2. Records filed every 6-9 months 3. Facility is believed to have been compliant for at least 8 quarters 4. Process parameters & control equipment are inspected 5. NYSDEC has the authority to impose punitive measures 6. Operators follow daily O&M instructions 7. Subject to Title V (or other) compliance certification 8. Subject to inspection once every 3 years or more frequently	90%
1. Source specific monitoring used as indicator of compliance 2. Records filed every year 3. Facility is believed to be meeting its compliance schedule 4. Process review and inspection of control equipment 5. NYSDEC has the authority to impose punitive measures 6. Operators follow daily or weekly O&M instructions 7. Not subject to compliance certification 8. Subject to inspection once every 5 years or more frequently	80%

C. Conformity Requirements

The CAA prohibits federally-funded projects from interfering with the ability of a state to come into compliance with a NAAQS through its SIP. SIPs establish baseline emissions and also project emission changes through the period of future years covered by the SIP. The projected emission levels throughout this period are considered to be a part of the state's budget for emissions of the pollutant(s) covered by the SIP.

Under conformity requirements, emissions from federally-funded or approved projects are not allowed to cause these emission budgets to be exceeded. The motor vehicle emissions budgets (MVEBs) are presented in section III.C.3; the general conformity budget for the Tappan Zee

Bridge construction emissions is discussed in section III.C.3, and appears in Tables 9 and 12 for the year in the plan that coincides with the Tappan Zee Hudson River Crossing (TZHRC) project schedule, 2017.

1. Transportation Conformity

Under the CAA, federally funded transportation projects must not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of NAAQS. In other words, these projects, and any emissions changes resulting from them, must "conform" to implementation plans developed by states for the criteria pollutants. Conformity generally applies to projects funded or approved by the Federal Highway Administration or the Federal Transit Administration in areas that do not meet or previously have not met a NAAQS for a criteria pollutant (i.e., nonattainment or maintenance areas). A one year grace period is allowed for newly-designated nonattainment or maintenance areas.

Conformity does not apply in attainment or unclassifiable areas. Conformity determinations are also not required for certain exempt projects, such as safety projects (e.g., lighting, guardrails), vehicle rehabilitation, shelters, and maintenance building construction, and other projects such as sign removal, noise reduction, and planning.

Generally, the metropolitan planning organizations (MPOs) involved in transportation planning for each area are responsible for determining if projects and their overall transportation implementation plan (TIP) conform to the state's SIP. The MPOs develop the necessary conformity determinations allowing for public input and hearings in the process demonstrating that their transportation projects meet conformity requirements. State transportation departments and air agencies, and the Federal Highway Administration, Federal Department of Transportation, and EPA are all involved in reviewing conformity determinations and TIPs developed by the MPOs.

State air quality plans contain emission reductions for each pollutant or precursor for each source sector (on-road motor vehicles, nonroad equipment and vehicles, and stationary and area sources). The level of emissions for on-road motor vehicles, such as cars, trucks, and buses, is referred to as the "motor vehicle emissions budget." Budgets are developed as part of the air quality planning process by state air quality or environmental agencies, and approved by EPA. For transportation conformity, projected emission changes resulting from construction projects involving highway and transit use must not cause this budget to be exceeded. Both long- and short-term emissions must be considered, including the direct emissions of $PM_{2.5}$ from exhaust, brake and tire wear, and road and construction dust, along with indirect $PM_{2.5}$ precursor emissions.

To maintain conformity, emissions from new projects can be mitigated or offset. This can be done through planning strategies or Transportation Control Measures, which are specific projects or programs designed to reduce emissions from transportation sources by reducing vehicle use, changing traffic flow, or congestion conditions. Examples include programs for improving public transit, developing high occupancy vehicle facilities, and ordinances to promote non-motorized vehicle travel.

2. General Conformity

Section 176(c) of the CAA prohibits federal agencies from conducting activities in nonattainment or maintenance areas that do not conform to a state's SIP. General conformity requirements are in place to ensure federal activities not related to transportation or highway projects do not interfere with the SIP budgets, do not cause or contribute to new violations, and ensure the timely attainment and maintenance of the NAAQS as the schedule exists in the SIP. Examples of these sorts of activities are harbor dredging or beach rehabilitation by the Army Corps of Engineers, where heavy diesel equipment is used both on land and on off-shore vessels, increasing the emissions of PM and NO_x.

General conformity differs from transportation conformity in that it applies to projects that were not considered in the TIP, as the TIP applies to highways and mass transit. All federal actions not covered under transportation conformity are covered under general conformity requirements unless the actions do not exceed de minimis levels. General conformity requirements can be met by: (1) showing emission increases are already covered in the SIP; (2) the state agreeing to modify the SIP to include the emissions; (3) finding offsets for the increased emissions; or, (4) mitigating the increased emissions. Conformity restrictions may also be avoided through construction strategies or planning, such as conducting construction operations outside of the ozone season when specific NO_x emission restrictions do not apply.

3. Conformity Budgets

a. Motor Vehicle Emission Budgets

For the purposes of transportation conformity, the emission budget is essentially a cap on the total emissions allocated to on-road vehicles. The projected regional emissions calculated based on a transportation plan, transportation improvement program, or project may not exceed the MVEB or cap contained in the appropriate SIP. Emissions in years for which no motor vehicle emissions budgets are specifically established must be less than or equal to the motor vehicle emissions budget established for the most recent prior year.

b. $PM_{2.5}$ Precursors

For transportation conformity, four $PM_{2.5}$ precursors – NO_x, VOCs, NH_3, and SO_x – must be considered in the conformity process in $PM_{2.5}$ nonattainment areas. The EPA requirements for the consideration of $PM_{2.5}$ precursors are:

- Regional emissions analysis must include NO_x as a $PM_{2.5}$ precursor in all $PM_{2.5}$ nonattainment areas, unless the head of the state air agency and the USEPA Regional Administrator make a finding that NO_x is not a significant contributor to the $PM_{2.5}$ air quality problem in a given area;
- Regional emissions analyses are not required for VOC, SO_x or NH_3 before an approved SIP budget for such precursors is established, unless the head of the state air agency or the EPA Regional Administrator makes a finding that on-road emissions of any of these precursors is a significant contributor. The following criteria are considered in making significance or insignificance findings for $PM_{2.5}$ precursors:
    - The contribution of on-road emissions of the precursor to the total 2007 baseline SIP inventory;
    - The current state of air quality for the area;

- The results of speciation monitoring for the area;
- The likelihood that future motor vehicle control measures will be implemented for a given precursor; and,
- Projections of future on-road emissions of the precursor.

After reviewing the EPA requirements and the criteria regarding significance, the transportation conformity budgets for $PM_{2.5}$ precursors will only include the establishment of an annual NO_x budget for the $PM_{2.5}$ nonattainment area addressed by this attainment demonstration SIP revision.

c. Road Dust and Construction Related Fugitive Dust

The Federal Transportation Conformity Rule specifies that re-entrained road dust is to be included as a component of direct $PM_{2.5}$ for transportation conformity regional emissions analysis only if the EPA Regional Administrator or the director of the state air agency has made a finding that emissions from re-entrained road dust within the area are a significant contributor to the $PM_{2.5}$ nonattainment problem and has so notified the MPO and the Department. Also, for $PM_{2.5}$ areas in which the implementation plan does not identify construction-related fugitive $PM_{2.5}$ as a significant contributor to the nonattainment problem, the fugitive $PM_{2.5}$ emissions associated with highway and transit project construction are not required to be considered in the regional emissions analysis.

The EPA has indicated that a finding of significance for re-entrained road dust would be based on a case-by-case review of the following factors: the contribution of road dust to current and future $PM_{2.5}$ nonattainment; an area's current design value for the $PM_{2.5}$ standard; whether control of road dust appears necessary to reach attainment; and whether increases in re-entrained dust emissions may interfere with attainment. Such a review would include consideration of local air quality data and/or air quality or emissions modeling results.

Findings of significance have not been made for either re-entrained road dust or construction-related fugitive dust for the NYMA nonattainment area. Previous review of speciated data by the Department indicates that between three to six percent of fine particulate mass is attributable to all sources of geologic material. Therefore, neither re-entrained road dust emissions nor fugitive dust emissions from highway and transit project construction have been included in the $PM_{2.5}$ transportation conformity budgets. A more detailed discussion of re-entrained road dust is included in section III.B.1.c.

d. Maintenance Budgets for the Annual $PM_{2.5}$ NAAQS

The proposed maintenance transportation conformity emission budgets for directly emitted $PM_{2.5}$ and annual NO_x ($PM_{2.5}$ precursor) are provided in Table 15. These budgets are for both the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS. The proposed maintenance budgets are based on the latest planning assumptions. These budgets are based on MOVES modeling and the development of a 2007 base year inventory and projection inventories for 2017 and 2025. In order to develop appropriate MVEB maintenance budgets for 2009, the Department ran the MOVES model and did not project 2007 emissions. The 2009 runs were based on appropriate inputs for 2009 including 2009 VMT and registration data as well as all other appropriate inputs.

Table 15. Transportation Conformity Emission Budgets for the 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS for the NYMA $PM_{2.5}$ Maintenance Area (Tons/Year)

Type of Budget	$PM_{2.5}$ [(a)]	NO_x
NYMA nonattainment area 2009 MVEB[(b)]	5,516.75	106,020.09
NYMA nonattainment area 2017 MVEB[(c)]	3,897.71	68,362.66
NYMA nonattainment area 2025 MVEB[(c)]	3,291.09	51,260.81

Notes: (a) Direct $PM_{2.5}$ consists of the sum of: organic carbon, elemental carbon, particulate matter from gasoline vehicles, brake particles, and tire particles
(b) 2009 MVEB's are based on 2009 inputs[26]
(c) 2017 and 2025 MVEB are projections from the 2007 base year inventory

e. A Budget to Address the Tappan Zee Hudson River Crossing Project Construction Emissions

The Department actively participated in the review of the Environmental Impact Statement (EIS) for the TZHRC project. As part of that process, DEC agreed with the U.S. Army Corps of Engineers and the U.S. Coast Guard determination that general conformity applies to the emissions associated with the TZHRC construction. These include bridge construction, demolition of the existing bridge, dredging activities and transport of dredged materials to the Historic Area Remediation Site. In addition to the inclusion of these emissions in the Final EIS by the project sponsors, the Department committed to adopt and submit the necessary SIP revisions to include construction emissions from the TZHRC project.

In particular, the environmental impact statement for the TZHRC included a demonstration that the emissions of CO and NO_x exceed the *de minimis* thresholds in 40 CFR Part 93.153(b)(1). Specifically, peak construction emissions are estimated to be 101.7 tons per year (TPY) of CO in the New York State portion of the New York-New Jersey-Connecticut CO maintenance area and 457.0 TPY of NO_x in the New York State portion of the New York-New Jersey-Connecticut ozone and $PM_{2.5}$ nonattainment areas. It should be noted that the Department's commitment letter to EPA, dated May 24, 2012, included emissions estimates of 106.5 TPY for CO and 560.5 TPY for $NO_{x.}$ An error was found in the assumptions used to develop the emissions estimates between the Draft and Final EIS. As such, the Department has included the corrected emissions in Tables 9 and 12 of this document for the year in the plan that coincides with the TZHRC project schedule, 2017.

To address the general conformity NO_x *de minimis* exceedance, the Department has included, per 40 CFR Part 93.158(a)(5)(i)(B), the 457.0 tons per year of NO_x in this SIP submission. The Department has also included an analysis demonstrating that all SIP requirements and milestones will continue to be met with the inclusion of the NO_x emissions from the TZHRC. In addition, this submission includes the identification of specific measures that have been incorporated into

[26] 2009 maintenance budgets are being included for transportation conformity purposes. The NYMA $PM_{2.5}$ maintenance area attained the standard in 2009 and these maintenance budgets are consistent with the timing of the area reaching attainment and the Department's clean data submission.

the plan as well as a demonstration that all existing applicable SIP requirements are being implemented in the area for the pollutants affected by the TZHRC.

The Department has determined that the responsible federal agencies are requiring all reasonable mitigation measures associated with their actions (Clean Fuels, Best Available Tailpipe Reduction Technologies, Utilization of Newer Equipment, Tug Boat Emissions Reduction, Concrete Batch Plant Controls, and Idling Restrictions) and they have included a detailed air quality analysis supporting their conformity determination.

D. Contingency Measures

In addition to the adopted regulations listed in section II.C, several other state regulations are being pursued that would further ensure the reduction of $PM_{2.5}$ concentrations for the purpose of maintaining the annual and 24-hour NAAQS. These regulations have either already been proposed, or are still being drafted by the Department, but are generally expected to be adopted within the next couple years.

The Department is unable to prepare contingency regulations that are automatically "triggered" into effectiveness should a future design value in the NYMA again exceed either $PM_{2.5}$ NAAQS. The regulations listed below, however, are part of the Department's continuous planning for various criteria pollutants. For example, revisions to the fuel sulfur content regulations of Part 225 are designed to assist in compliance with the $PM_{2.5}$ NAAQS, the SO_2 NAAQS, and obligations under the regional haze program. Additionally, EPA's revision of the $PM_{2.5}$ NAAQS, announced December 14, 2012, may prompt additional planning by states to meet the more stringent annual standard.

- Revisions to 6 NYCRR Part 225 – *Fuel Composition and Use*
    - The Department adopted on April 5, 2013 revisions to subpart 225-1 – *Fuel Composition and Use – Sulfur Limitations*. Previous limits for residual (#6) fuel oil range from 0.30 to 1.50 percent sulfur by weight, depending on location. This revision lowers the maximum sulfur level to 0.50 percent by weight in all areas of the state where it is not already lower (i.e. New York City (0.30 percent) and Nassau, Rockland, and Westchester Counties (0.37 percent)). Facilities will be required to purchase residual oil with these revised sulfur contents beginning July 1, 2014, and to fire such oil beginning July 1, 2016. The sulfur content limit of distillate (#2) fuel oil is also being reduced, to 15 ppm from various previous limits. Compliance with this new distillate limit is required by July 1, 2014 or July 1, 2016, depending on the type of fuel that is currently burned.
- New 6 NYCRR Part 222 – *Distributed Generation*
    - The Department is drafting a regulation affecting distributed generation (DG) sources. A DG source generates electricity exclusively for the facility at which it is located, and may include emergency generators, demand response sources, economic dispatch sources, and combined heat and power systems. The regulation would likely place NO_x and/or PM standards on new and/or existing DG sources that are not already subject to state or federal limits.

- Revisions to 6 NYCRR Part 228 – *Surface Coating Processes, Commercial and Industrial Adhesives, Sealants and Primers*
    - The Department adopted on June 5, 2013 a revision to subpart 228-1 – *Surface Coating Processes* to incorporate VOC RACT requirements contained in federal Control Techniques Guidelines (CTGs) that had been issued by EPA. The CTGs, and the dates they were issued, are as follows: Flat Wood Paneling Coatings (September 2006); Metal Furniture Coatings (September 2007); Large Appliance Coatings (September 2007); Automobile and Light-Duty Truck Assembly Coatings (September 2008); Miscellaneous Metal and Plastic Parts Coatings (September 2008); Paper, Film, and Foil Coatings (September 2007); and, Wood Furniture Coatings (April 1996).
- Revisions to 6 NYCRR Part 230 – *Gasoline Dispensing Sites and Transport Vehicles*
    - The Department is drafting a proposal to revise Part 230 to further reduce VOC emissions from gasoline dispensing facilities (GDFs) and transport vehicles. Emissions of VOCs from the transfer of gasoline can be significant: over six billion gallons of gasoline are distributed to about 7,500 retail sites in New York each year. The major changes being considered are the adoption of EPA's stage I requirements, and the removal of stage II requirements in the NYMA in light of increased propagation of onboard refueling vapor recovery (ORVR) systems.

IV. SUMMARY

The Department believes it has addressed and satisfied all the criteria of section 107(d)(3)(E) of the CAA for the EPA redesignation of a nonattainment area to attainment. This SIP submittal specifically demonstrates attainment of the NAAQS, with monitored design values below the annual and 24-hour levels since the 2007-2009 time period. It also details the regulations and control requirements that have been adopted to reduce ambient concentrations, and provides for continued maintenance of the NAAQS. Because the area is currently achieving the annual and 24-hour standards, and emissions are projected to decrease further as a result of state and federal regulations, it stands to reason that continued attainment can be assured.

Based on fulfillment of the CAA section 107(d)(3)(E) criteria, the Department is formally requesting that EPA redesignate the New York portion of the NY-NJ-CT $PM_{2.5}$ nonattainment area to attainment for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS.