Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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December 13, 2013

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building, 1101A
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

RE: Recommended Designations for the 2012 Annual $PM_{2.5}$ National Ambient Air Quality Standard

Dear Administrator McCarthy:

I am writing to provide you with Connecticut's recommended designation for the revised annual fine particle ($PM_{2.5}$) national ambient air quality standard (NAAQS), which EPA promulgated on December 14, 2012. Section 107(d)(l) of the Clean Air Act (CAA) provides up to one year after promulgation of new or revised NAAQS for states to submit recommendations identifying areas that comply with the standard or that violate or contribute to nearby violations of the standard.

Based on the enclosed review of data from Connecticut's ambient air quality monitoring network, the entire state continues to measure compliance with the revised $PM_{2.5}$ NAAQS. Further health-protective improvements in $PM_{2.5}$ air quality can be expected from initiatives such as EPA's Clean Air Interstate Rule (CAIR) and mobile source diesel control programs as well as Connecticut's low sulfur fuel strategy, low emission vehicle (LEV) requirements, diesel engine retrofit program and our recently announced electric vehicle charging station initiative. As a result, I recommend that the entire State of Connecticut be designated as "attainment" for the revised annual $PM_{2.5}$ NAAQS.

I also want to thank EPA for its recent efforts to formally redesignate the New York-New Jersey-Connecticut area from nonattainment to attainment for the 2006 24-hour and 1997 annual $PM_{2.5}$ NAAQS. The steady improvement in $PM_{2.5}$ air quality over the last decade is due to an appropriate combination of in-state emission controls and reduced transport from upwind states. We can achieve similar success with ozone if EPA requires upwind states to reduce emissions sufficiently to address the overwhelming transport that can contribute 90 percent or more to Connecticut's worst ozone levels.

Thank you for your consideration of this attainment recommendation. Please contact Anne Gobin, Chief of DEEP's Bureau of Air Management at 860-424-3026 with any questions regarding this recommendation. We look forward to working with you to complete the designation process for the revised $PM_{2.5}$ NAAQS.

Sincerely,

Daniel C. Esty
Commissioner

Enclosure
cc: Curtis Spalding (EPA Region I)
David Conroy (EPA Region I)
Anne Gobin

ATTACHMENT
Connecticut's Recommended Designations for the 2012 $PM_{2.5}$ NAAQS
(December 2013)

Introduction

Particulate matter (PM) pollution includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. These solid and liquid particles come in a wide range of sizes. Particles less than 10 micrometers in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the largest health risks. Because of their small size (less than 5% of the average width of a human hair), fine particles can lodge deeply into the lungs.

Health studies have shown a significant association between exposure to fine particles and premature mortality. Other important effects include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and cardiac arrhythmia. Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children.

Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. Particles with diameters between 2.5 and 10 micrometers are referred to as "coarse." Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads.

Sections 108 and 109 of the Clean Air Act (CAA) govern the establishment, review, and revision, as appropriate, of the National Ambient Air Quality Standards (NAAQS) to provide protection for the nation's public health ("primary" NAAQS) and the environment ("secondary" NAAQS). The CAA requires the U.S. Environmental Protection Agency (EPA) to conduct periodic reviews (at five-year intervals) of the science upon which the standards, as well as the standards themselves, and to promulgate appropriate revisions. EPA has established NAAQS for both PM_{10} and $PM_{2.5}$. The remainder of this document focuses on the $PM_{2.5}$ NAAQS.

The EPA first promulgated NAAQS for fine particles ($PM_{2.5}$) in July 1997[1], establishing identical primary and secondary standards for both 24-hour and annual average times at 65 micrograms per cubic meter ($\mu g/m^3$) and 15.0 $\mu g/m^3$, respectively. Based on EPA's review of new health information gathered during the next required review cycle, EPA subsequently tightened the primary and secondary 24-hour $PM_{2.5}$ NAAQS in 2006[2] to 35 $\mu g/m^3$. All of

[1] 62 FR 38652 (July 18, 1997).
[2] 71 FR 61144 (October 17, 2006).

Connecticut is currently designated by EPA as attainment for both the 1997 and 2006 $PM_{2.5}$ NAAQS[3].

On December 14, 2012, the EPA finalized the most recent revisions[4] to the $PM_{2.5}$ NAAQS, concluding that recent health studies warranted adoption of a more stringent annual standard of 12.0 micrograms per cubic meter ($\mu g/m^3$), while retaining both the 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ and the secondary standards.

Designation Process for the 2012 Annual $PM_{2.5}$ NAAQS

After the EPA establishes or revises a NAAQS, the CAA requires the EPA and states to take steps to ensure that the new or revised standard is met. The first step, known as the initial area designations, involves identifying areas of the country that either meet or do not meet the new or revised NAAQS along with the nearby areas contributing to violations. Section 107(d)(1) of the CAA provides up to one year after adoption of a new or revised NAAQS for each state to submit recommendations to EPA identifying areas within the state's borders that comply with the standard or that violate or contribute to nearby violations of the standard. If, after evaluating a state's recommendations, EPA believes the available evidence supports a designation different from the state's recommendation, then EPA must provide the state at least a 120-day period to comment on the potential modification prior to promulgating final designations. The CAA requires EPA to complete the designation process within two years after adoption of a new or revised NAAQS, unless the Administrator determines that there is insufficient information. In such cases, EPA may take up to one additional year to promulgate initial area designations.

EPA's final rulemaking promulgating the 2012 $PM_{2.5}$ NAAQS specifies the schedule[5] to establish designations in accordance with CAA Section 107(d)(1). State recommendations for attainment and nonattainment areas and boundaries are due by December 13, 2013. The initial state recommendations should be based on air quality data from the years 2010 through 2012. EPA intends to respond to states' initial recommendations by August 14, 2014. States will then have the opportunity to comment on EPA's response, and to provide any new information and analyses to EPA. In most cases, 2013 ambient $PM_{2.5}$ monitoring data will be available in time for states to update their recommendations and for EPA to include the data when determining final designations.

[3] EPA recently granted final approval for Connecticut's Redesignation and Maintenance Plan for the southwestern portion of the state (i.e., Fairfield and New Haven Counties). EPA previously included those counties as part of the New York/New Jersey/Connecticut (NY/NJ/CT) nonattainment area for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS (78 FR 58467, September 24, 2013).
[4] 78 FR 3086 (January 15, 2013, with a NAAQS effective date of March 18, 2013.
[5] 78 FR 3250.

Summary of Connecticut's $PM_{2.5}$ Air Quality Data

As of the end of 2012, the Connecticut Department of Energy and Environmental Protection (DEEP) operated a network[6] of eleven $PM_{2.5}$ monitors throughout the state, recognized by EPA as meeting Federal Reference Method (FRM) criteria. Two of the sites, Criscuolo Park in New Haven and McAuliffe Park in East Hartford, operate on a daily sample schedule while all the other sites operate on a 1-in-3 day sample schedule. Two sites, Waterbury and Criscuolo Park in New Haven, operate collocated $PM_{2.5}$ FRM samplers on a 1-in-6 day sample schedule.

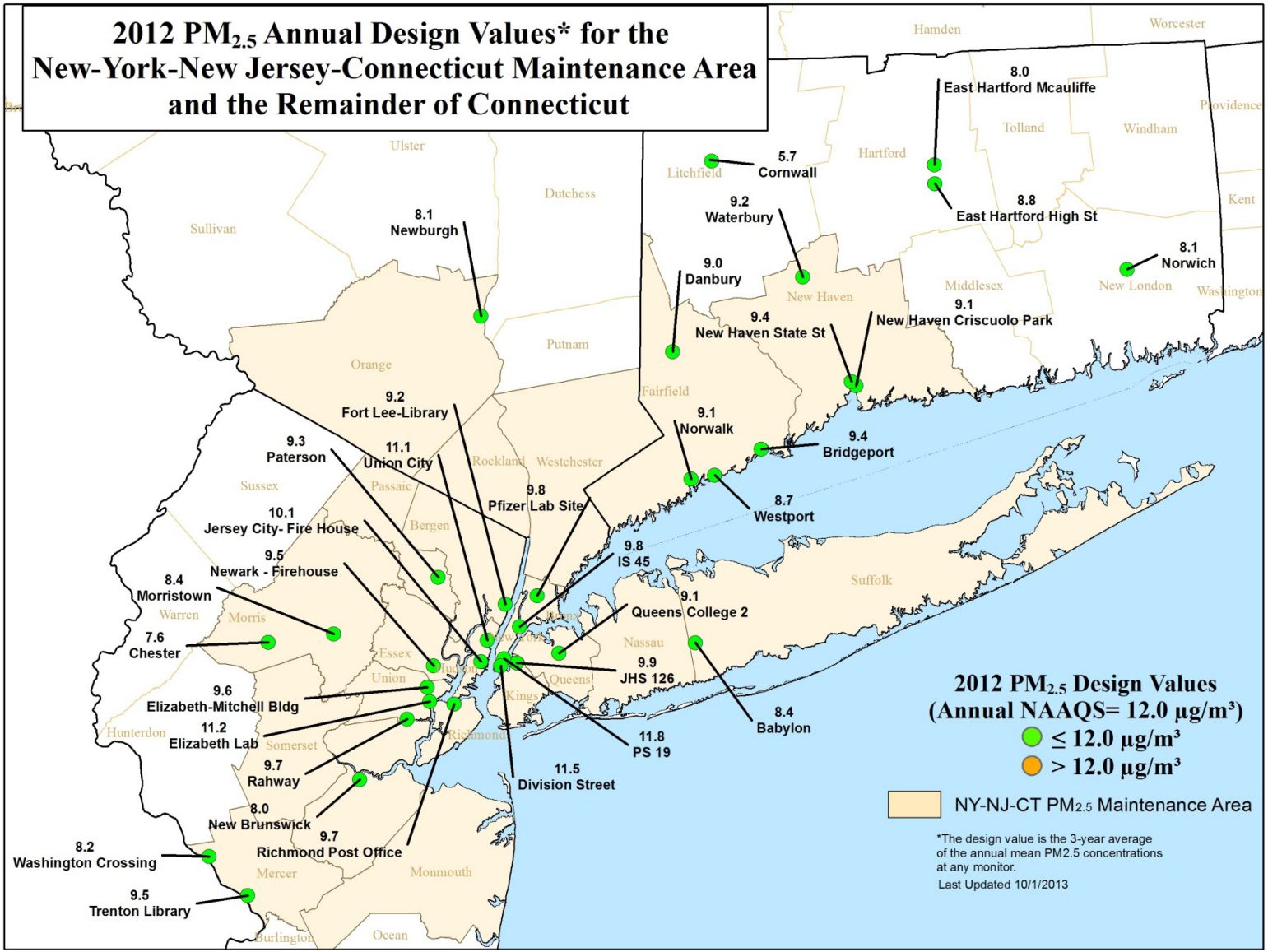
Figure 1 shows the locations and lists the 2012 annual $PM_{2.5}$ design values[7] for each of DEEP's $PM_{2.5}$ monitoring sites, as well as those located in the New York and New Jersey portions of the NY/NJ/CT maintenance area. Table 1 provides yearly details for the Connecticut monitors for each of the three years used to determine the 2012 design value, for comparison to the annual (12.0 $\mu g/m^3$) NAAQS. (For informational purposes, design values are also included for comparison the 24-hour NAAQS of 35 $\mu g/m^3$). All monitors recorded 2012 design values that comply with the $PM_{2.5}$ NAAQS. The highest measured 2012 annual design value was 9.4 $\mu g/m^3$, recorded at both the Bridgeport and the New Haven State Street monitoring stations.

Table 1. 2012 $PM_{2.5}$ Design Values for Connecticut

Site Name	Site ID	2010 ($\mu g/m^3$)		2011 ($\mu g/m^3$)		2012 ($\mu g/m^3$)		2012 Design Values ($\mu g/m^3$)	
		98th %tile Daily	Annual Average	98th %tile Daily	Annual Average	98th %tile Daily	Annual Average	24-Hr DV	Annual DV
Bridgeport	09-001-0010	23.3	8.8	23.7	10.0	21.5	9.3	**23.0**	**9.4**
Danbury	09-001-1123	25.7	9.1	24.8	9.6	21.6	8.4	**24.0**	**9.0**
Norwalk	09-001-3005	23.0	8.7	25.2	10.0	22.5	8.6	**24.0**	**9.1**
Westport	09-001-9003	24.2	8.6	28.7	9.5	19.5	8.0	**24.0**	**8.7**
East Hartford McAuliffe	09-003-1003	24.2	7.6	24.3	8.9	18.0	7.3	**22.0**	**8.0**
East Hartford High St	09-003-2006	23.5	8.6	23.2	9.3	20.3	8.5	**22.0**	**8.8**
Cornwall	09-005-0005	19.1	6.0	17.0	5.7	15.0	5.5	**17.0**	**5.7**
New Haven Criscuolo	09-009-0027	25.5	8.9	27.5	10.1	20.6	8.3	**25.0**	**9.1**
New Haven State St	09-009-1123	23.9	9.0	26.6	10.0	22.0	9.2	**24.0**	**9.4**
Waterbury	09-009-2123	25.7	9.2	24.3	9.9	20.6	8.4	**24.0**	**9.2**
Norwich	09-011-3002	21.3	7.8	22.6	9.0	19.7	7.6	**21.0**	**8.1**

[6] For details, see DEEP's 2013 Annual Air Monitoring Network Plan, approved by EPA on September 17, 2013.
[7] $PM_{2.5}$ design values are determined in accordance with Appendix N to 40CFR50.

Figure 1. 2012 $PM_{2.5}$ Annual Design Values



Figures 2 and 3 show annual and 24-hr design values trends for the period from 2001 through 2012 at Connecticut longest operating monitor locations. Both depict steady downward trends, especially over the most recent five-year period. All Connecticut monitors have measured compliance with the 2012 annual $PM_{2.5}$ NAAQS since at least 2009.

Figure 2. Annual $PM_{2.5}$ Design Value Trends for Connecticut (2001-2012)

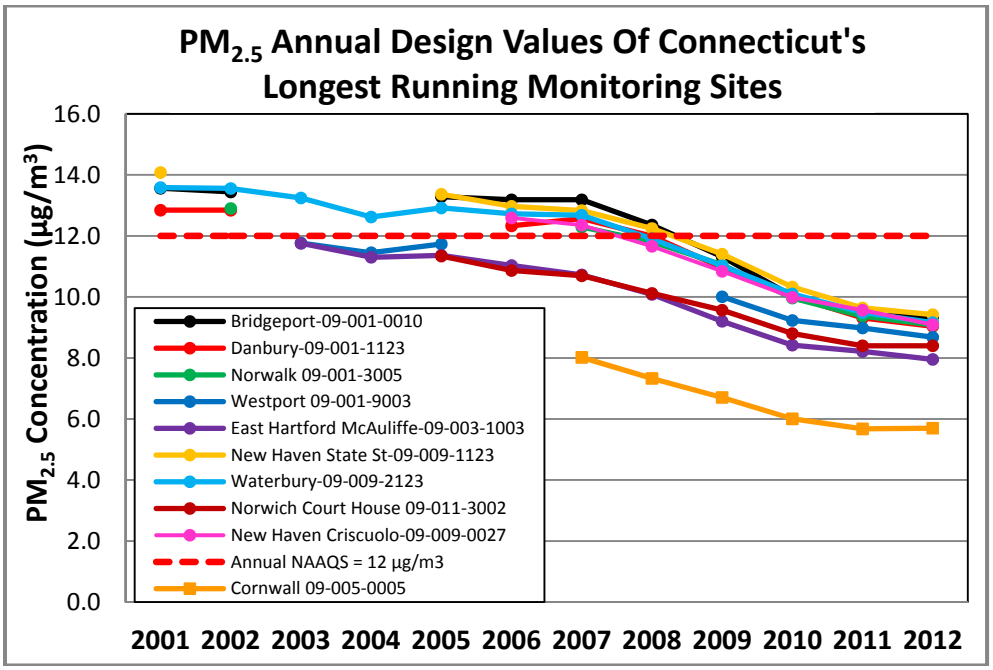
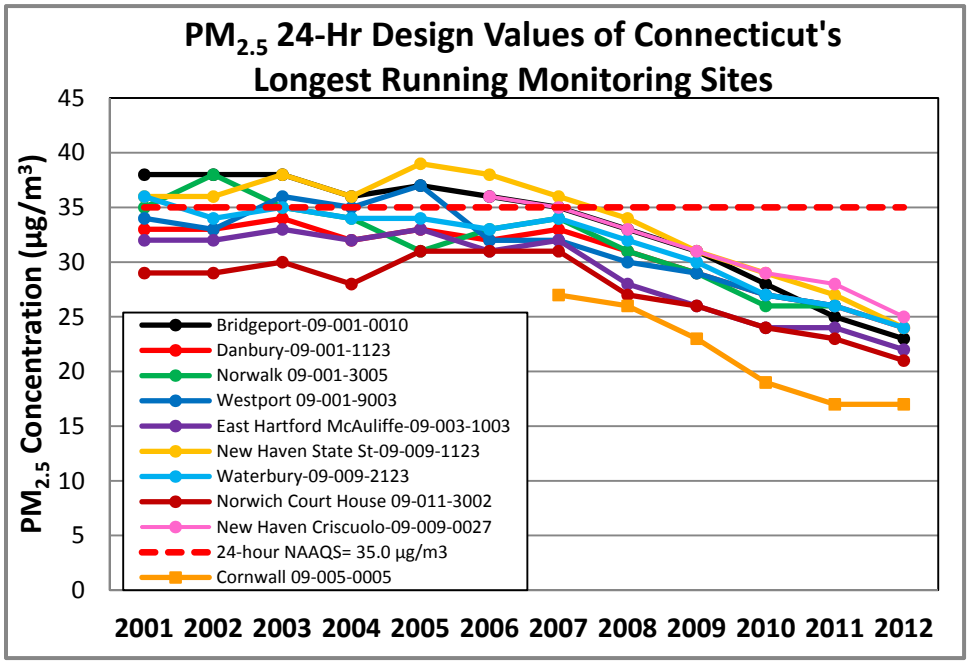


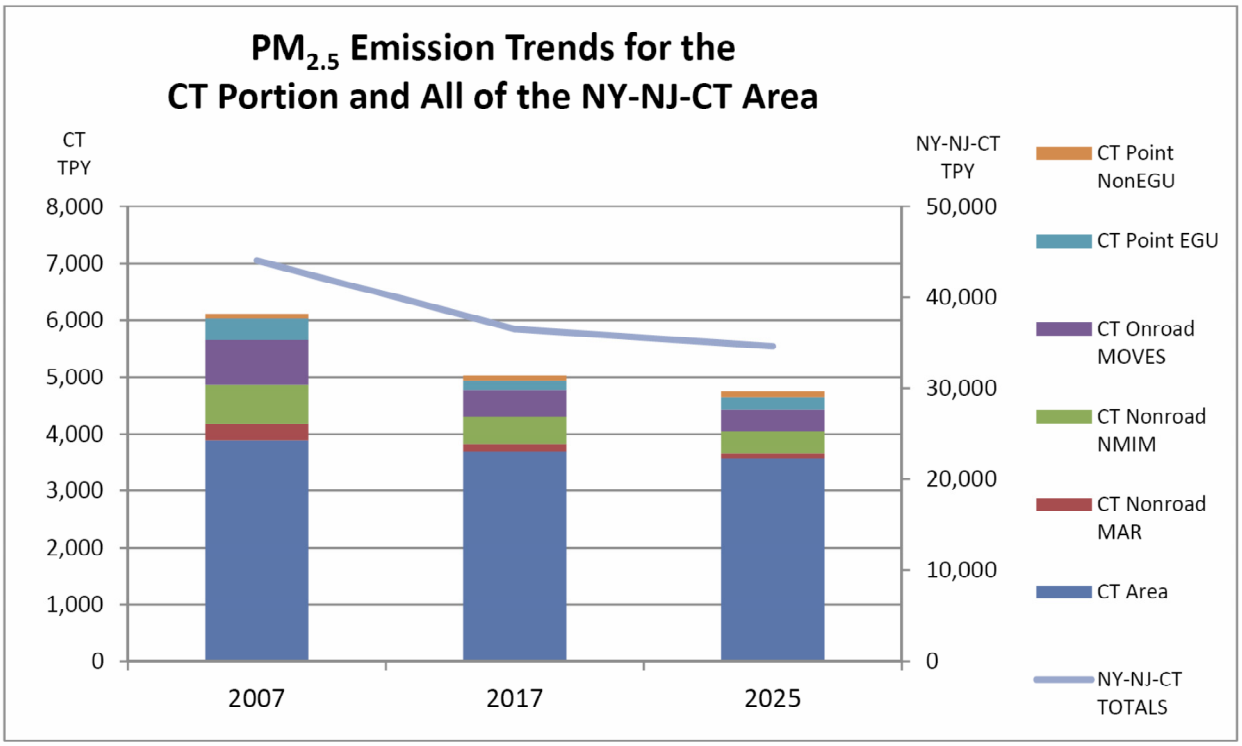
Figure 3. 24-hour $PM_{2.5}$ Design Value Trends for Connecticut (2001-2012)



Improvement in Connecticut's $PM_{2.5}$ air quality is attributed to federal and state emission control programs that have resulted in significant emission reductions of directly emitted $PM_{2.5}$ and important precursor species (e.g., sulfur dioxide and nitrogen oxides) that contribute to the formation of secondary fine particles in the atmosphere.

Connecticut's recently approved Redesignation Request and Maintenance Plan for the 1997 and 2006 $PM_{2.5}$ NAAQS includes emission estimates and projections. Figure 4 summarizes estimated annual $PM_{2.5}$ emissions in 2007, 2017 and 2025 by major source sector for the Connecticut portion of the NY-NJ-CT $PM_{2.5}$ maintenance area, as well for the entire maintenance area. Overall, directly emitted $PM_{2.5}$ is projected to decrease by more than 20% between 2007 and 2025.

Figure 4. $PM_{2.5}$ Emission Projections 2007-2025



Figures 5 and 6 provide the same information for NO_x and SO_2 emissions, respectively, which are known precursors to secondary $PM_{2.5}$ formation. Emissions of NOx and SO_2 are projected to decrease by more than 50% and 40%, respectively, between 2007 and 2025. These significant reductions in $PM_{2.5}$-related emissions will further improve air quality and ensure that Connecticut remains in compliance with the $PM_{2.5}$ NAAQS.

Figure 5. NOx Emission Projections 2007-2025

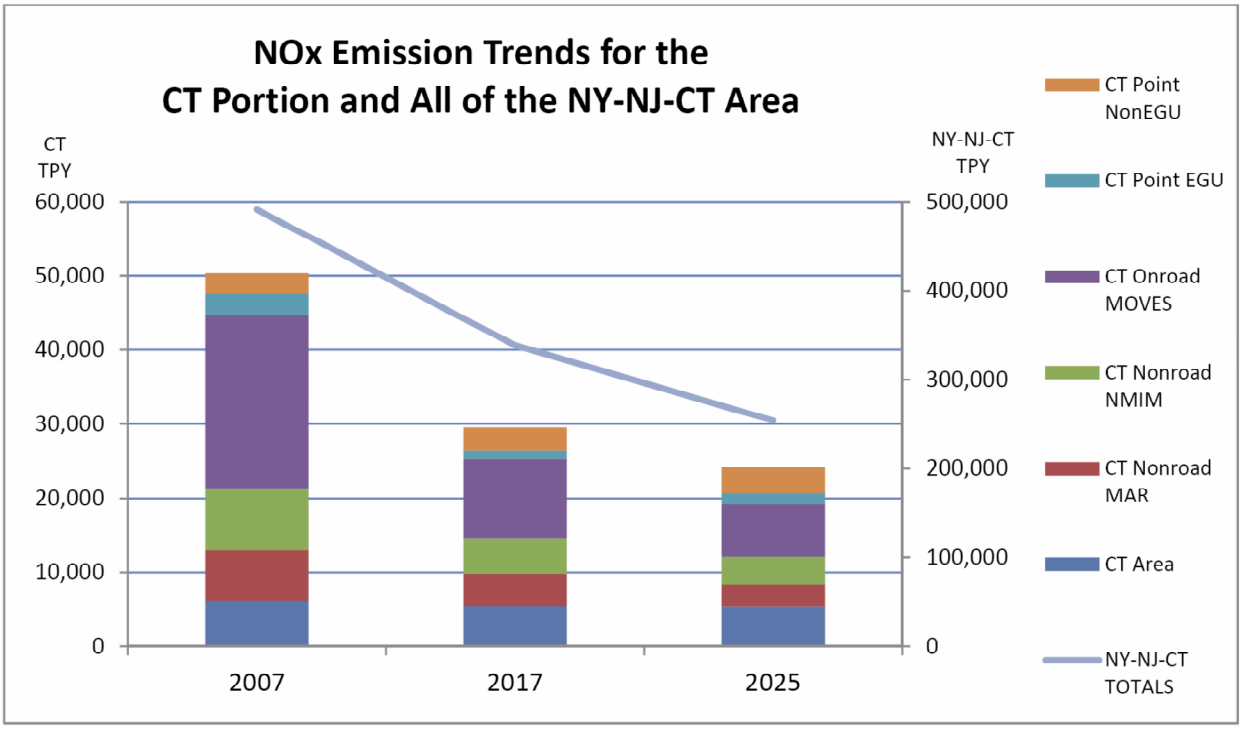
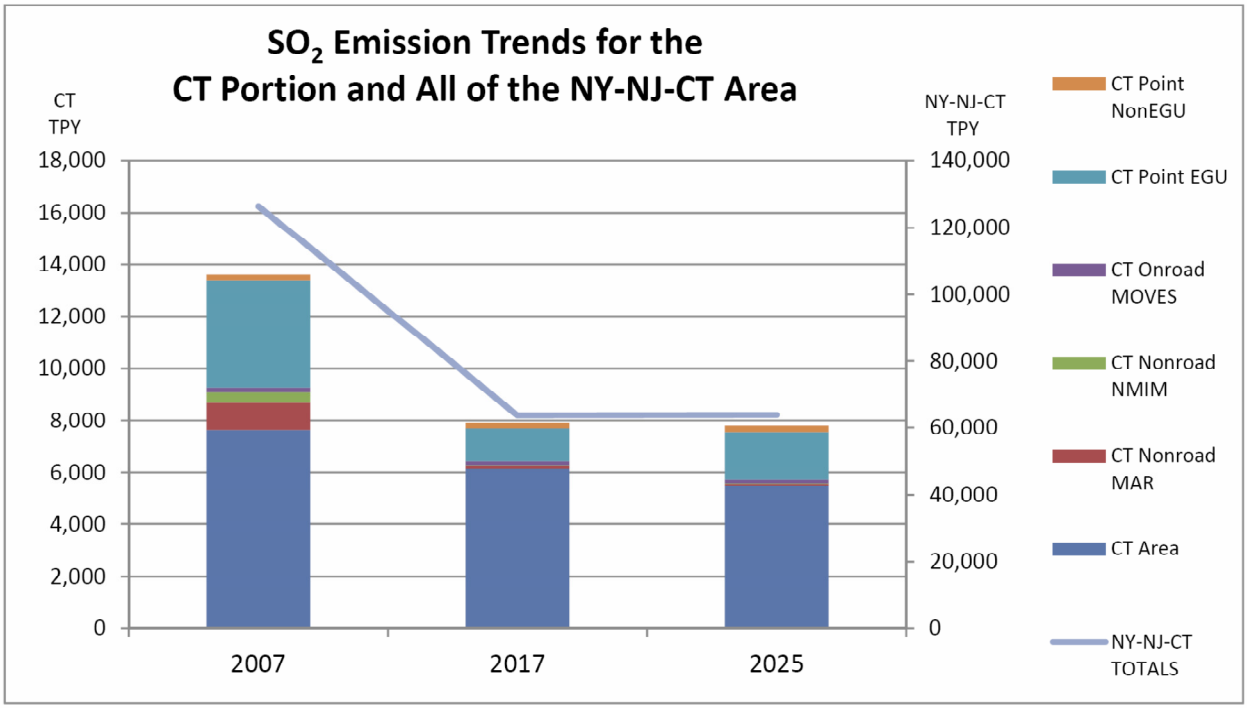


Figure 6. SO_2 Emission Projections 2007-2025



Recommendation

The analyses presented above demonstrate that all monitors in Connecticut have measured compliance with the 2012 annual $PM_{2.5}$ NAAQS since at least 2009. Adopted federal and state emission control programs are expected to continue the ongoing decline in $PM_{2.5}$-related emissions into the foreseeable future, ensuring continued compliance with the $PM_{2.5}$ NAAQS. Therefore, in accordance with CAA Section 107(d)(1), Connecticut recommends that EPA designate the entire state of Connecticut as attainment for the 2012 annual $PM_{2.5}$ NAAQS.