Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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VIA ELECTRONIC MAIL

June 22, 2015

Arthur Johnson, Acting Director
USEPA Region 1 - Office of Environmental Measurement and Evaluation
11 Technology Drive
North Chelmsford, MA 01863
johnson.arthur@epa.gov

RE: Connecticut 2015 Annual Air Monitoring Network Plan

Dear Mr. Johnson:

Attached please find for your approval the Connecticut 2015 Annual Air Monitoring Network Plan (Plan). The Department of Energy and Environmental Protection (Department) drafted the Plan in fulfillment of the requirements set forth in 40 Code of Federal Regulations (CFR) Parts 53 and 58, as amended by the Revisions to Ambient Air Monitoring Regulations (71 Fed. Reg. 61236, October 17, 2006).

The Department worked closely with your staff in developing the Plan and sought out public comment on the Plan. In addition to posting the Plan for a 30-day public comment period on the Department's website, the Department reached out to its key stakeholders by presenting the Plan and directly soliciting comments from Connecticut's State Implementation Plan Revision Advisory Committee (SIPRAC). SIPRAC is comprised of approximately 400 members representing business and industry, the environmental community, the public, and academia - all of whom have interests in working on Connecticut's air quality issues.

I look forward to receiving your approval on this monitoring plan for Connecticut. If you have any questions concerning this network plan, please contact Peter Babich of my staff at 860-424-3422.

Sincerely,

Anne Gobin

Anne Gobin, Chief
Bureau of Air Management

CC: Robert Judge, EPA R1

Enc: Connecticut 2015 Annual Air Monitoring Network Plan

Connecticut 2015 Annual Air Monitoring Network Plan

Connecticut Department of Energy and Environmental Protection
Bureau of Air Management
June 22, 2015

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Acronyms and Abbreviations

AQI – Air Quality Index
AQS – Air Quality System
BAM – Beta Attenuation Monitor
BC – Black Carbon (Aethalometer)
CAA – Clean Air Act
CFR – Code of Federal Regulations
CO – carbon monoxide
CSA – combined statistical area
CSN – Chemical Speciation Network
DEEP – Connecticut Department of Energy and Environmental Protection
DAS – data acquisition system
EC/OC – Elemental Carbon/Organic Carbon
EPA – Environmental Protection Agency
FEM – Federal Equivalent Method
FRM – Federal Reference Method
GC – gas chromatography
GC/MS – gas chromatography/mass spectrometry
HAP – hazardous air pollutant
IMPROVE – Interagency Monitoring of Protected Visual Environments
LMP – limited maintenance plan
MPA – monitoring planning area
MSA – metropolitan statistical area
NAAQS – National Ambient Air Quality Standards
NOAA – National Oceanic and Atmospheric Administration
NOx – nitrogen oxides
NOy – reactive oxides of nitrogen
OAQPS – Office of Air Quality Planning and Standards
PAMS – Photochemical Assessment Monitoring Stations
$PM_{2.5}$ – fine particulate matter (<2.5 microns)
PM_{10} – respirable particulate matter (<10 microns)
$PM_{10-2.5}$ – coarse particulate matter (PM_{10} – $PM_{2.5}$)
QA – quality assurance
QA/QC – quality assurance/quality control
QAPP – quality assurance project plan
QMP – quality management plan
RH – relative humidity
SIP – State Implementation Plan
SLAMS – state and local monitoring stations
SO_2 – sulfur dioxide
SOP – standard operating procedure
TSA – technical system audit
TSP – total suspended particulate
UVC – Ultra-violet carbon (aethalometer)
VOC – volatile organic compound

Introduction

This document is the Connecticut 2015 Air Monitoring Network Plan (Network Plan), prepared by the Connecticut Department of Energy and Environmental Protection (DEEP) in accordance with 40 CFR 58.10. This plan meets the requirement to develop and submit to the Environmental Protection Agency (EPA) an annual air quality monitoring network plan to describe the air monitoring network and propose any changes of air quality monitoring sites and monitored air pollutants planned in the 18 months following submittal.

DEEP held a public comment period from May 15, 2015 to June 14, 2015, for the draft Network Plan. The Network Plan is posted on DEEP's website at DEEP: Air Monitoring Network.

Background

The Clean Air Act of 1970 (CAA) established the Environmental Protection Agency as the principal administrative body to enact regulations to meet the requirements of the CAA and subsequent amendments thereto. One such requirement directed EPA to set primary and secondary air quality standards, known as the National Ambient Air Quality Standards (NAAQS) for the six "criteria pollutants" that Congress determined presented serious negative impacts to human health and welfare. For areas within Connecticut that do not meet a NAAQS, DEEP develops State Implementation Plans (SIPs) to detail the steps to be taken to bring air quality into attainment. Ambient air quality monitoring is essential to track progress towards meeting clean air goals and demonstrate attainment.

While DEEP monitors ambient air quality in Connecticut primarily for comparison with the NAAQS, there are other important objectives to ambient air quality monitoring. This monitoring provides local air quality data to the public, supports air quality forecasting and the Air Quality Index (AQI), supports long-term health assessments and other scientific research, assists with air permitting and identifying long-term air quality trends to gauge effectiveness of air pollution control strategies and serves as an accuracy check on computer based air quality models. DEEP's ability to manage the air quality monitoring network depends significantly on federal support from EPA.

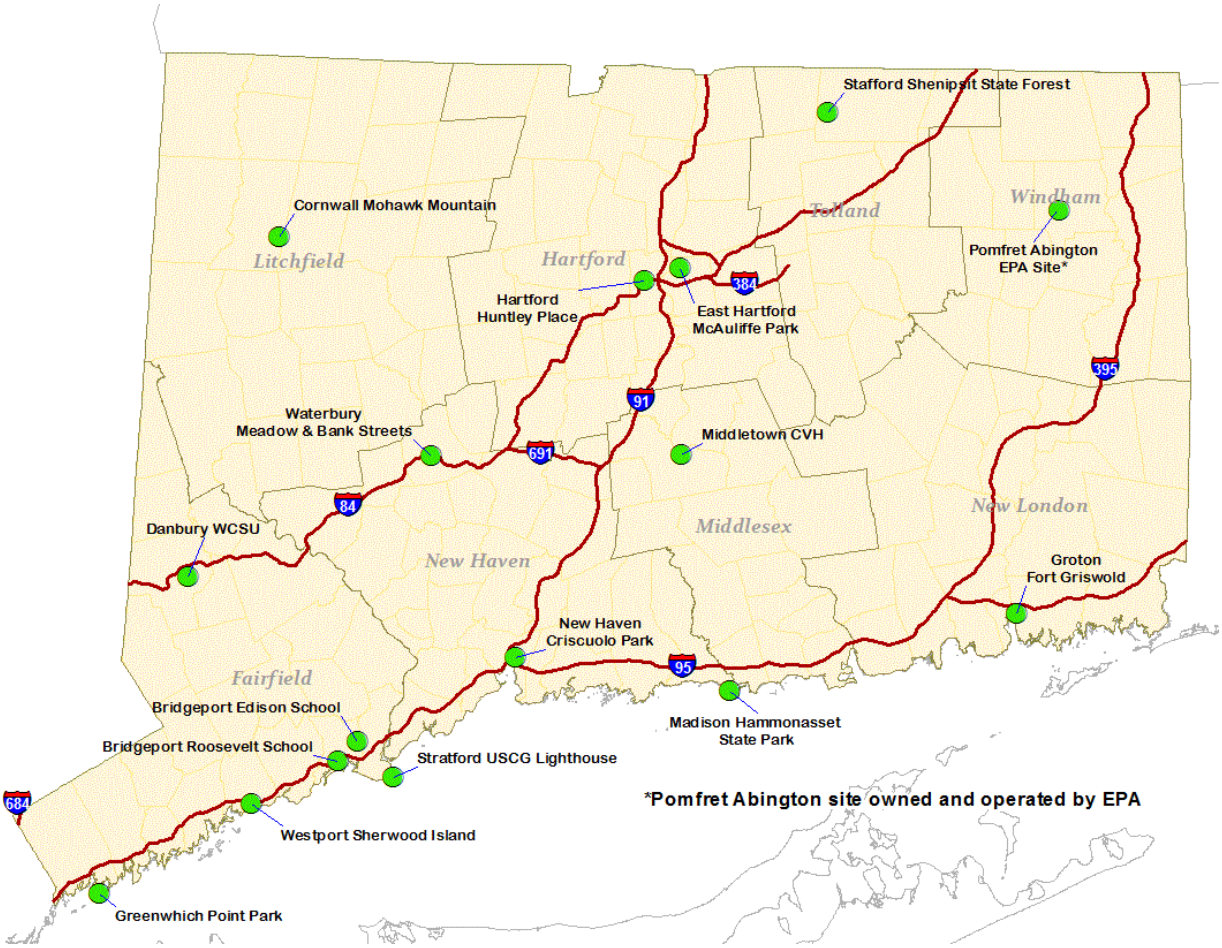
Future federal funding levels for air monitoring programs remain uncertain. In addition, as with state governmental operations everywhere, state resources allocated to ambient air quality monitoring are unable to keep pace with rising costs. DEEP must continue to provide an acceptable level of service within these constraints by continually improving and focusing its efforts to ensure the completion of the most critical ambient air quality monitoring. As operating costs and federal monitoring requirements increase, DEEP must do more with fewer resources by either improving operational efficiencies or reducing other aspects of the air monitoring network. Efficiencies being employed include improvements to data acquisition (through software upgrades and the automating of data streams previously manual), to public data access (thorough Kiosks and improvements to the website), and to reduction of the number of monitoring sites by increasing multi-pollutant monitoring (resulting in consolidation of resources).

Network Overview

DEEP currently operates 15 stations in its air monitoring network (Figure 1). Given continuously evolving standards, this Plan assumes the current level of staffing and federal funding will be maintained through federal FY15. Should EPA monitoring requirements significantly increase or should DEEP be impacted by staff attrition or a reduction in federal funding, the level of effort proposed in this Plan will have to be revisited.

In October 2006, EPA established a network of core multi-pollutant sites. These sites are known as the National Core (NCore) network, the primary purpose of which is to consolidate monitoring of multiple pollutants at fewer sites for efficiency and cost savings. In addition, the NCore sites provide a comprehensive suite of high-resolution pollutant data for NAAQS compliance assessment, research studies and long-term trends analysis. There are two NCore sites located in Connecticut: Criscuolo Park in New Haven, and Mohawk Mountain in Cornwall. Although these sites predated NCore, DEEP upgraded both sites consistent with NCore requirements.

Figure 1: Connecticut DEEP Air Monitoring Network



Proposed Network Changes

Details of the proposed monitoring network configuration are described in the following site information pages. In addition to infrastructure maintenance and improvements, DEEP proposes to make the following changes to the monitoring network during the period 2015-2016:

- Discontinuing Pb-PM10 (lead) sampling at the New Haven Criscuolo Park NCore site on September 30, 2015 (end of EPA fiscal year).
- Commencing reporting of continuous $PM_{2.5}$ data from all remaining non-FEM continuous $PM_{2.5}$ monitoring sites as federal equivalent method (FEM) data eligible for comparison to the $PM_{2.5}$ NAAQS on January 1, 2016.
- Discontinuing FRM $PM_{2.5}$ monitoring at the Westport Sherwood Island State Park site on December 31, 2015.
- Reducing sampling frequencies to one-in-six days for $PM_{2.5}$ FRM monitors at Bridgeport Roosevelt School, Danbury WCSU, East Hartford McAuliffe Park and Waterbury Bank Street on January 1, 2016.
- Reducing sampling frequency from every day to one-in-three days for the $PM_{2.5}$ FRM monitor at New Haven Criscuolo Park on January 1, 2016.
- Discontinuing PAMS VOC and $NO/NO_2/NO_X$ monitoring at the Westport Sherwood Island State Park as of January 1, 2015.

DEEP maintains its air monitoring network to fulfill critical data needs. Recent EPA NAAQS rule revisions have mandated additional monitoring, reporting and analysis associated with the SLAMS networks, and, consistent with the LEAN culture embraced by DEEP, this Network Plan calls for continued efforts to streamline data handling, while also looking for opportunities to identify and address low value added monitoring sites. If limited opportunities exist to disinvest from low value added monitoring sites, efficiencies nonetheless will occur by eliminating lower value data collection. Such efficiencies will be

necessary to enable limited staff resources to focus on competing priorities, which may not be limited to air quality monitoring. If efficiencies alone are insufficient, either additional resources will be required or the scope of the monitoring program will need to be revisited.

Decommissioning Discontinued Sites: DEEP is planning to take steps to ensure that all former monitoring sites are properly decommissioned with regard to shelter, landscaping, security, monitoring, electronics and utility equipment during 2015-2016.

Monitoring Site Information

The ambient air monitoring sites currently operated by DEEP are listed in the Table 1 below. Detailed information for each monitoring site is provided in a later section of this plan.

Table 1: Monitoring Network Summary

Town	Site	PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
Bridgeport	Edison School														X											
Bridgeport	Roosevelt School	1/3 1/6		X		1/6										X							X			
Cornwall	Mohawk Mountain	1/3		P	X	1/3		X				1/3	X	X	X	X	X	X			X	X	X	X	X	
Danbury	Western Connecticut State University	1/3 1/6		p	X								X	X							X	X	X			
East Hartford	McAuliffe Park	1/1 1/6		X		1/6							X	X	X	X	X		X		X	X	X	X	X	X
Greenwich	Point Park													X							X	X	X			
Groton	Fort Griswold	1/6		X										X									X			
Hartford	Huntley Place	1/3		P	X			X					X			X	X			X	X	X	X		X	
Madison	Hammonasset State Park													X							X	X	X			
Middletown	Connecticut Valley Hospital													X							X	X	X			
New Haven	Criscuolo Park	1/1 1/3	1/6	p	X	1/3	1/6	X	1/6	1/12	1/3		X	X	X	X	X	X	X		X	X	X	X	X	X
Stafford	Shenipsit State Forest													X							X	X	X			
Stratford	Stratford Lighthouse													X									X			
Waterbury	Meadow & Bank Street	1/3 1/6	1/6	X																	X	X	X			
Westport	Sherwood Island State Park	1/3												X			X		X		X	X	X			

X=Existing P = Planned in 2015/16 X = Proposed to terminate in 2015/2016

National Ambient Air Quality Standards (NAAQS)

The EPA's Office of Air Quality Planning and Standards (OAQPS) has set NAAQS for six principal pollutants, known as the criteria pollutants. Table 2 summarizes the current NAAQS compliance requirements for the criteria pollutants.

Table 2: National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary / Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [78 FR 3086, Jan 15, 2013]	$PM_{2.5}$	primary	Annual	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	Annual	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010]		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

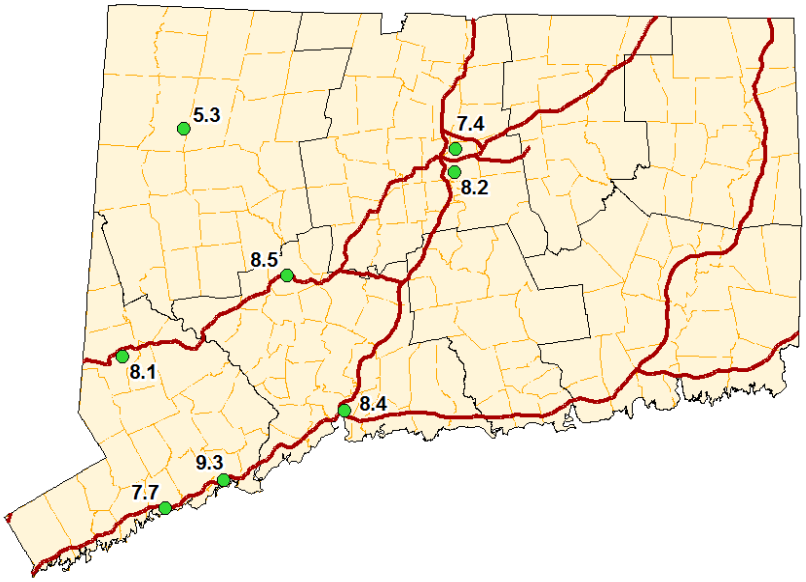
(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

$PM_{2.5}$ Annual Design Values (2014)

The 2014 annual design values for $PM_{2.5}$, based on 2012 through 2014 data, are presented in the table and figure below. $PM_{2.5}$ annual design values are calculated using the 3-year average of the respective annual weighted averages. The current annual $PM_{2.5}$ NAAQS is 12.0 $\mu g/m^3$. All Connecticut monitors demonstrate compliance with the design value for the annual $PM_{2.5}$ NAAQS.

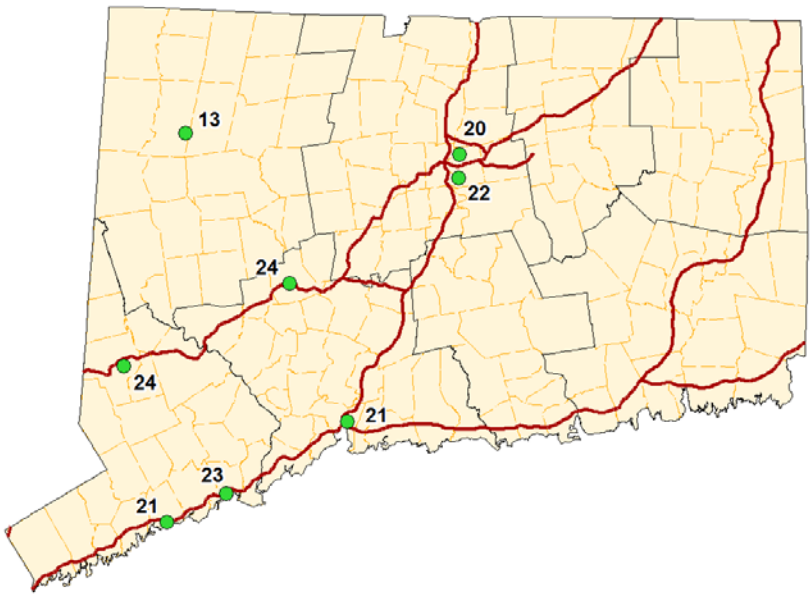
Site	Design Value ($\mu g/m^3$)
Bridgeport	9.3
Cornwall	5.3
Danbury	8.1
East Hartford – High St.	8.2
East Hartford – McAuliffe	7.4
New Haven – Criscuolo	8.4
Waterbury	8.5
Westport	7.7



$PM_{2.5}$ Daily Design Values (2014)

Daily design values for $PM_{2.5}$ using 2012 through 2014 data are given below. $PM_{2.5}$ daily design values are calculated using the 3-year average of the annual 98th percentile values. The daily $PM_{2.5}$ NAAQS is 35 $\mu g/m^3$, revised in 2006 from the previous daily standard of 65 $\mu g/m^3$. Final designations relative to the 2006 24-hour $PM_{2.5}$ NAAQS were finalized by EPA in November 2009 (effective as of December 14, 2009), based upon measured data from 2006 through 2008. All Connecticut monitors demonstrate compliance with the design value for the 24-hour $PM_{2.5}$ NAAQS.

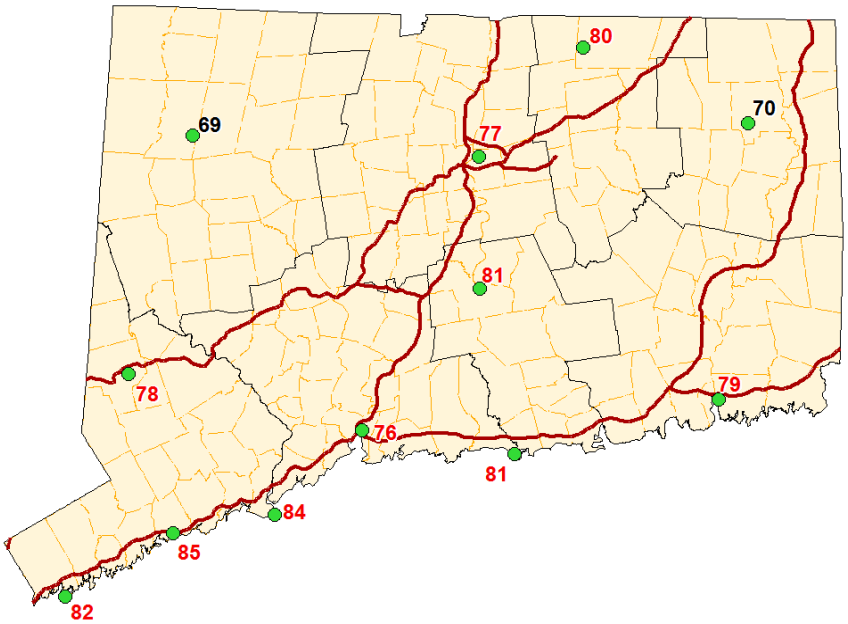
Site	Design Value ($\mu g/m^3$)
Bridgeport	23
Cornwall	13
Danbury	24
East Hartford – High St.	22
East Hartford - McAuliffe	20
New Haven – Criscuolo	21
Waterbury	24
Westport	21



Ozone Design Values (2014)

The 2014 ozone 8-hour design values are given in the table below. Ozone design values are derived by averaging three consecutive annual fourth highest daily maximum 8-hour ozone values. Based on the March 2008 revised ozone standard of 0.075 ppm (75 ppb), 9 out of 11 sites indicate nonattainment, shown in red font below. Currently, the ozone monitoring season in Connecticut is from April through September.

Site	Design Value (ppb)
Abington	70
Cornwall	69
Danbury	78
East Hartford	77
Greenwich	82
Groton	79
Madison	81†
Middletown	81
New Haven	76
Stafford	80
Stratford	84
Westport	85



† Site was moved approximately 450 meters in 2012 within state park boundaries. Data is combined from the 2 locations to compute the design values.

CO, SO_2, NO_2, PM_{10} and Pb NAAQS Comparisons (2014)

Comparisons of ambient levels of CO, SO_2, NO_2, PM_{10} and Pb to the primary NAAQS are provided in the tables below. The design values for each pollutant were derived in accordance with 40 CFR 50. For PM_{10}, the 3-year fourth-high value is given to indicate the ambient level relative to the standard, as the actual design value is the expected number of annual exceedances of the standard, averaged over a 3-year period, which is in attainment with a value of less than or equal to one.

CO NAAQS Comparison

Site	1-Hr Design Value (ppm)	8-Hr Design Value (ppm)
Bridgeport	2.4	1.4
Cornwall	2.6	0.6
East Hartford	1.9	1.3
Hartford	1.9	1.4
New Haven	1.6	1.3
NAAQS	**35**	**9**

SO_2 NAAQS Comparison

Site	1-Hr Design Value (ppb)
Bridgeport	10
Cornwall	5
East Hartford	8
New Haven	18
Westport	11
NAAQS	**75**

NO_2 NAAQS Comparison

Site	1-Hr Design Value (ppb)	Annual Design Value (ppb)
Cornwall	22	2
East Hartford	42	9
Hartford*	50	15
New Haven	49	13
Westport	43	9
NAAQS	**100**	**53**

*Data incomplete-site began 4/1/2013

PM_{10} NAAQS Comparison

Site	Daily Design Value ($\mu g/m^3$ STP)
Bridgeport	35
Cornwall	21
East Hartford	25
New Haven	37
NAAQS	**150**

Pb NAAQS Comparison

Site	Max 3-Yr 3-Month Mean ($\mu g/m^3$)
New Haven	0.04
NAAQS	**0.15**

Overview of Network Operation

DEEP operates a network of 15 sites throughout Connecticut used for monitoring air pollutants and meteorological parameters. This section contains information about monitoring methods and sampling frequencies, as well as monitoring network maps for each pollutant parameter. Network changes planned before the end of 2016 are discussed as are any anticipated network changes beyond that period.

$PM_{2.5}$ Network

Network Design The DEEP $PM_{2.5}$ network consists of Thermo Partisol®-Plus 2025/2025i sequential FRM air samplers with BGI VSCC (RFPS-0498-118) and Met One BAM 1020 continuous FEM air samplers (EQPM-0798-122) at nine air monitoring stations. The distribution of $PM_{2.5}$ sampling methods in the network and their applicability to NAAQS attainment are shown in Table 3. For the NAAQS compliance monitors, valid data from collocated and supplemental monitors, respectively, are used to fill in any missing or invalidated scheduled or nonscheduled days for the primary data set used for computing the design values. Four of the eight continuous BAM samplers in the network are designated FEM monitors (continuous FEM), having previously met performance criteria based on comparison with co-located FRM monitors, while the remaining four are designated as non-FEM (continuous BAM), by DEEP request and EPA concurrence, for non-NAAQS compliance purposes, such as AQI forecasting.

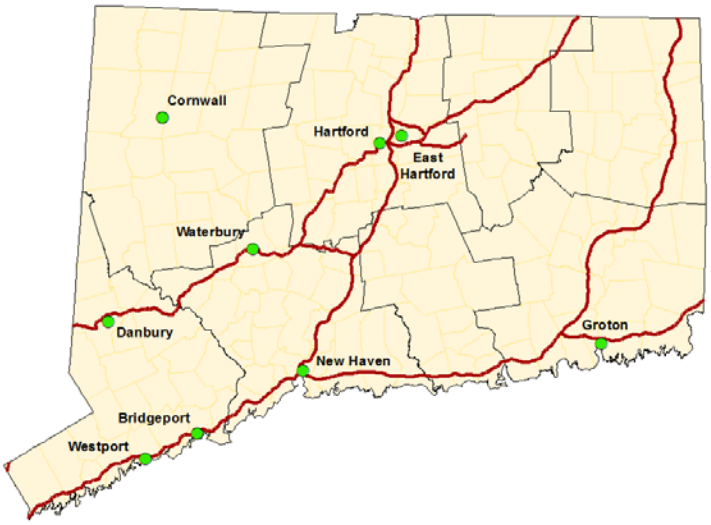


Table 3:$PM_{2.5}$ FRM/FEM Current Network Summary

Site	Primary (NAAQS)	Collocated (NAAQS)	Supplemental (NAAQS)	AQI (non-NAAQS)
Bridgeport-Roosevelt Sch.	Continuous FEM	1-in-3 FRM		
Cornwall-Mohawk Mt.	1-in-3 FRM			Continuous BAM
Danbury-WCSU	1-in-3 FRM			Continuous BAM
East Hartford-McAuliffe Pk.	1-in-1 FRM	Continuous FEM		
Groton-Ft. Griswold	Continuous FEM	1-in-6 FRM		
Hartford-Huntley Pl.	1-in-3 FRM			Continuous BAM
New Haven-Criscuolo Pk.	1-in-1 FRM	1-in-3 FRM		Continuous BAM
Waterbury-Bank St.	1-in-3 FRM	1-in-6 FRM	Continuous FEM	
Westport-Sherwood Isl.	1-in-3 FRM			

DEEP performed a network-wide FRM/FEM analysis, described below, using the most current data to determine the efficacy of designating additional continuous BAM $PM_{2.5}$ samplers as FEMs. Based on this review, DEEP is proposing to report all Met One BAM 1020 $PM_{2.5}$ data as FEMs commencing January 1, 2016. Given the increased availability of NAAQS compliance $PM_{2.5}$ data from the continuous FEMs, DEEP also proposes to reduce sampling frequency to 1-in-6 days at SLAMS sites, with the exception of the two NCore sites and the Hartford near-road site. Because DEEP maintains sufficient $PM_{2.5}$ sampling capacity in the Bridgeport-Stamford-Norwalk metropolitan statistical area (MSA) and $PM_{2.5}$ design values in this area continue to decrease, $PM_{2.5}$ sampling will be discontinued at Westport Sherwood Island State Park.

Continuous $PM_{2.5}$ BAM Performance Evaluation DEEP compared the continuous $PM_{2.5}$ (Met One BAM) data with $PM_{2.5}$ FRM data for the 3-year period 2012-2014. Hourly BAM data was aggregated to valid 24-hour averages when at least 75 percent of the hours in each day were valid. In cases where BAMs have

been designated FEMs in 2014, the FEM and non-FEM data sets were combined for the 3-year analysis. Linear regressions performed on the correlation plots are given in Appendix A. The slopes and intercepts of the regression lines are summarized in Table 4. Figure 2 shows the results of these correlations graphically, where slope/intercept points enclosed by the polygon comply with EPA FEM performance criteria.

Table 4: CT $PM_{2.5}$ FEM Performance Criteria Evaluation Summary (2012-2014 Data)

Correlation Data Summary							Evaluation Summary†			
Site Name	AQS ID	Slope	Intercept	R^2	No. Data Pairs	Meets FEM Performance Criteria	Slope ≥0.9 and ≤1.1	Intercept ≥-2 and ≤2	Intercept linear condition‡	Meets all performance conditions
Bridgeport Roosevelt School	09-001-0010	1.03	0.58	0.68	321	Y	1	1	1	1
Cornwall Mohawk Mt	09-005-0005	0.84	3.03	0.44	330	N	0	0	1	0
Danbury WCSU	09-001-1123	1.16	0.03	0.93	341	N	0	1	0	0
East Hartford McAuliffe Park	09-003-1003	1.02	1.03	0.86	979	Y	1	1	1	1
East Hartford High Street*	09-003-2006	1.09	1.35	0.85	331	N	1	1	0	0
Hartford Huntley Place**	09-003-0025	0.90	2.15	0.80	77	N	1	0	1	0
New Haven Criscuolo Park	09-009-0027	1.02	1.94	0.82	1024	N	1	1	0	0
Waterbury Bank Street	09-009-2123	1.06	1.03	0.76	335	Y	1	1	1	1

*Monitor/site shut down 12/31/2014, data shown for comparison.
**Incomplete data, FRM operations began March 2014.
†A value of 1 indicates condition satisfied, 0 indicates condition not satisfied
‡Intercept between 15.05-(17.32*Slope) and 15.05-(13.20*Slope)

The data indicate that three sites, Bridgeport Roosevelt School, East Hartford McAuliffe Park and Waterbury Bank Street, currently meet FEM criteria. The remaining sites nearly comply, with the exception of Cornwall, where $PM_{2.5}$ concentrations are uniformly low. Given these facts, Connecticut's relatively low $PM_{2.5}$ design values and DEEP's ongoing commitment to implementing best practices in field operations, DEEP plans to consider all MetOne BAM 1020 $PM_{2.5}$ monitors FEMs and commence reporting this data as available for NAAQS compliance beginning January 1, 2016.

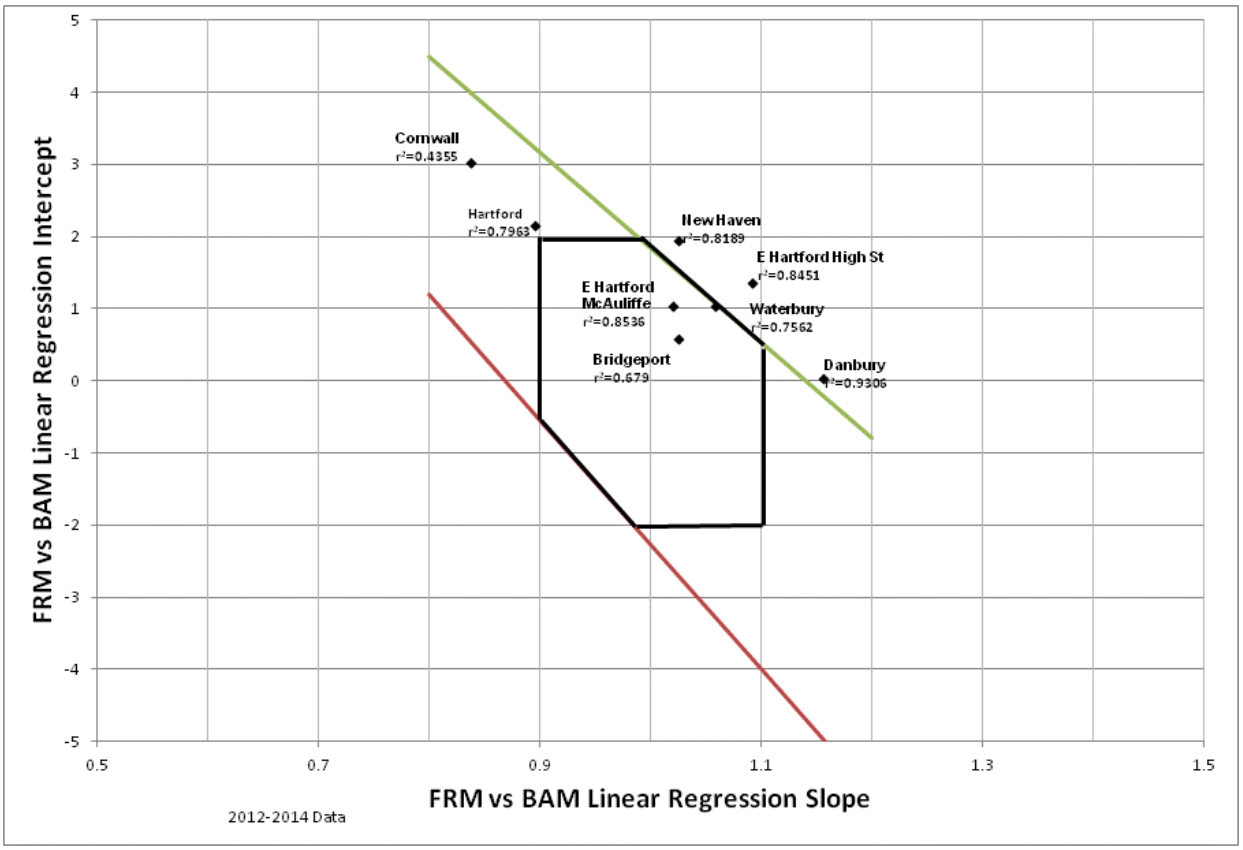
Proposed Changes in $PM_{2.5}$ FRM Sampling Frequencies: DEEP proposes reductions in manual (FRM) sampling frequencies for most of the SLAMS $PM_{2.5}$ monitors in the network, as allowed by CFR 40 58.12(d), where manual FRM and continuous FEM samplers are co-located. All sites have design values well below the threshold (85 percent of NAAQS level) that requires a minimum of 1-in-3 day sampling frequency. Specifically, DEEP proposes to reduce the New Haven Criscuolo Park NCore sampler from 1-in-1 day to 1-in-3 days, the East Hartford McAuliffe Park sampler from 1-in-1 day to 1-in-6 days, and the following 1-in-3 day samplers to 1-in-6 days: Bridgeport Roosevelt School, Danbury WCSU, Waterbury Bank Street, and New Haven Criscuolo Park collocated. Thus, the NCore and near-road manual FRM primary samplers will operate on the 3-day schedule, while the remainder would be on the 6-day schedule.

Proposed Termination of Westport $PM_{2.5}$: Minimum SLAMS network design criteria[1] for $PM_{2.5}$ monitoring require at least one monitor in a Metropolitan Statistical Area (MSA) having a population between 500,000 and 1,000,000 where design values are below 85 percent of NAAQS. Therefore, for the Bridgeport-Stamford-Norwalk MSA, which has a 2013 estimated population of about 940,000 and

[1] 40 CFR 58 Appendix D 4.7

maximum annual and 24-hour design values of 9.3 µg/m^3 and 24 µg/m^3, respectively, DEEP proposes to terminate the Westport monitor. Westport $PM_{2.5}$ has the lowest design values (7.7 and 21 µg/m^3) and is less indicative of population exposure than the other monitors (Danbury and Bridgeport) within the MSA.

Figure 2: CT $PM_{2.5}$ FEM Comparison with EPA Performance Standards (2012-2013 data)



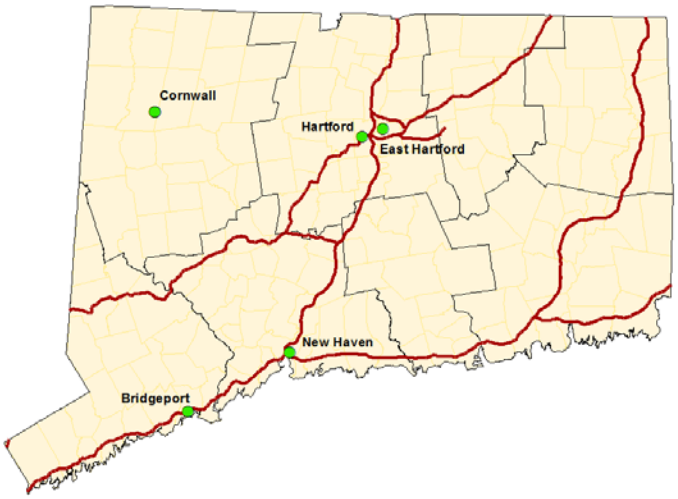
Summary of Proposed PM2.5 Network: Table 5 is a summary of the proposed configuration of the DEEP PM2.5 network.

Table 5: Proposed $PM_{2.5}$ Network Configuration

Site	Primary (NAAQS)	Collocated (NAAQS)	Supplemental (NAAQS)
Bridgeport-Roosevelt Sch.	Continuous FEM	1-in-6 FRM	
Cornwall-Mohawk Mt.	1-in-3 FRM	Continuous FEM	
Danbury-WCSU	1-in-6 FRM	Continuous FEM	
East Hartford-McAuliffe Pk.	1-in-6 FRM	Continuous FEM	
Groton-Ft. Griswold	Continuous FEM	1-in-6 FRM	
Hartford-Huntley Pl.	1-in-3 FRM	Continuous FEM	
New Haven-Criscuolo Pk.	1-in-3 FRM	1-in-6 FRM	Continuous FEM
Waterbury-Bank St.	1-in-6 FRM	1-in-6 FRM	Continuous FEM

PM_{10} / $PM_{10-2.5}$ FRM Network

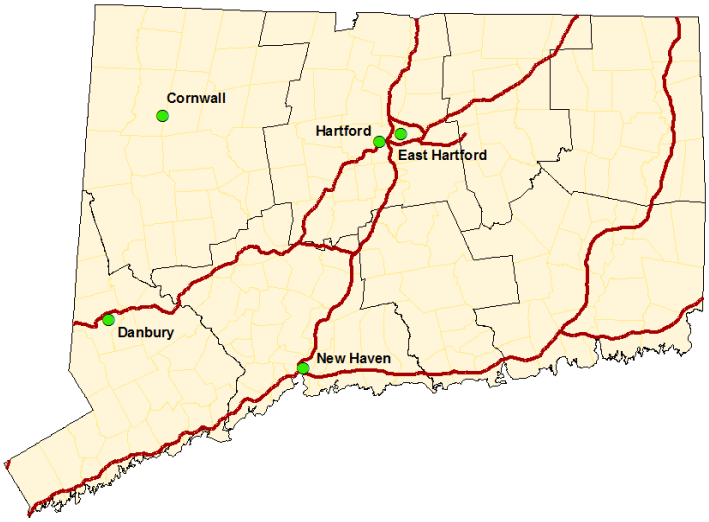
DEEP operates four PM_{10} FRM sites in the air monitoring network using Thermo Partisol®-Plus 2025/2025i sequential air samplers (RFPS-1298-127). The two NCore sites, Cornwall and New Haven, operate on a 1-in-3 day sample schedule, while Bridgeport and East Hartford are operated on a 1-in-6 day sample schedule. The New Haven NCore site has a collocated PM_{10} FRM sampler operating on a 1-in-6 day sample schedule. In addition to the FRM PM_{10} monitors, three sites, Cornwall Mohawk Mountain, New Haven Criscuolo Park and Hartford Huntley Place, have FEM Met One BAM 1020 continuous PM10 monitors (EQPM-0798-122). All sites that have PM_{10} FRM samplers are paired with $PM_{2.5}$ FRM samplers for coarse PM ($PM_{10-2.5}$). Coarse PM is defined as thoracic PM having particle aerodynamic diameters between 2.5 and 10 microns. No changes to this network are proposed through the end of 2016.



PM Speciation Network

$PM_{2.5}$ chemical speciation measurements are obtained at five sites in the DEEP air monitoring network. These include filter-based daily composite 1-in-3 day samples at the NCore sites, and continuous hourly black carbon at five sites.

The Interagency Monitoring of Protected Visual Environments (IMPROVE) monitor is located at the Cornwall site and the Chemical Speciation Network (CSN) monitor is at the New Haven Criscuolo Park site. Both sites are operated on the standard EPA PM 1-in-3 day sample schedule and provide 24-hour integrated filter-base measurements.

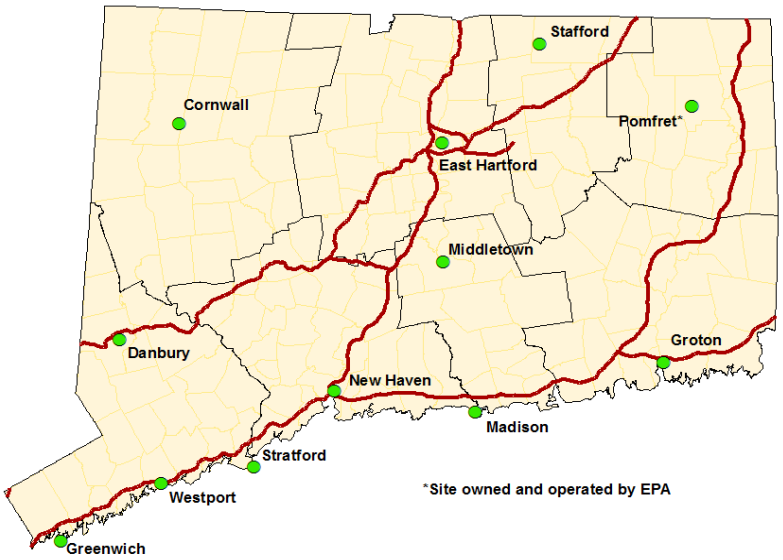


Black carbon (BC) and ultra-violet channel carbon (UVC), a wood smoke PM surrogate, are monitored at the Criscuolo Park, Cornwall, Hartford, East Hartford McAuliffe Park and Danbury WCSU sites using 7-channel TAPI Model 633 aethalometers. No changes are proposed to the PM speciation network during 2015-2016.

Ozone Network

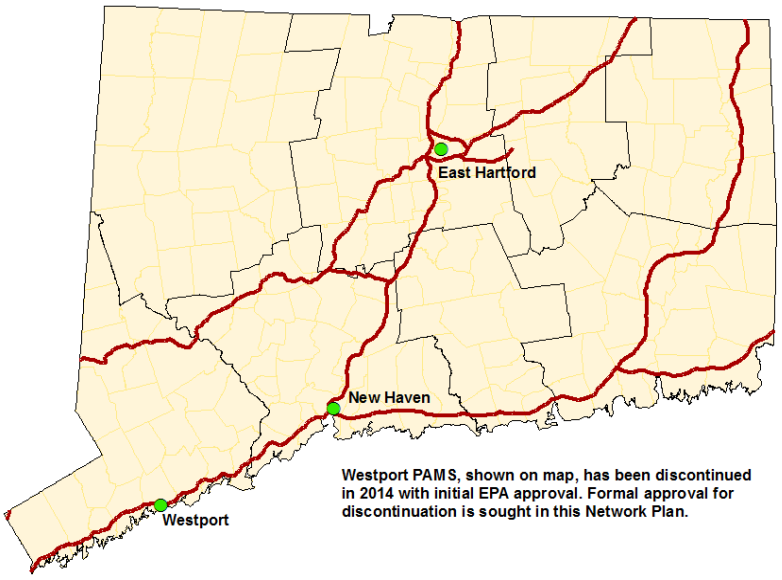
DEEP operates eleven ozone sites in the air monitoring network. The ozone analyzers at the Cornwall and New Haven Criscuolo Park sites are operated year-round, while the remaining sites are operated from April 1 through September 30. In addition to the DEEP network, EPA operates a seasonal ozone monitor in Abington (Pomfret) as part of its Clean Air Status and Trends (CASTNET) network.

Ozone monitoring in the DEEP network is conducted using Teledyne-API Model T400 UV photometric ozone analyzers (method EQOA-992-087). Ozone measurements are sent to the EPA AIRNow website for AQI purposes on an hourly basis. No changes to the ozone monitoring network are planned through the end of 2016.



PAMS Network

DEEP currently operates two Photochemical Assessment Monitoring Stations (PAMS) sites in the air monitoring network. PAMS measurements are obtained from June 1 through August 31 each year. PAMS sampling generates hourly measurements of 34 volatile organic compounds (VOCs) that are considered to be important precursors to ozone formation. Many of these compounds are also identified as hazardous air pollutants (HAPs). Two Synspec Gas Chromatographs (FID and PID detectors) are deployed at the East Hartford McAuliffe Park and New Haven Criscuolo Park sites.

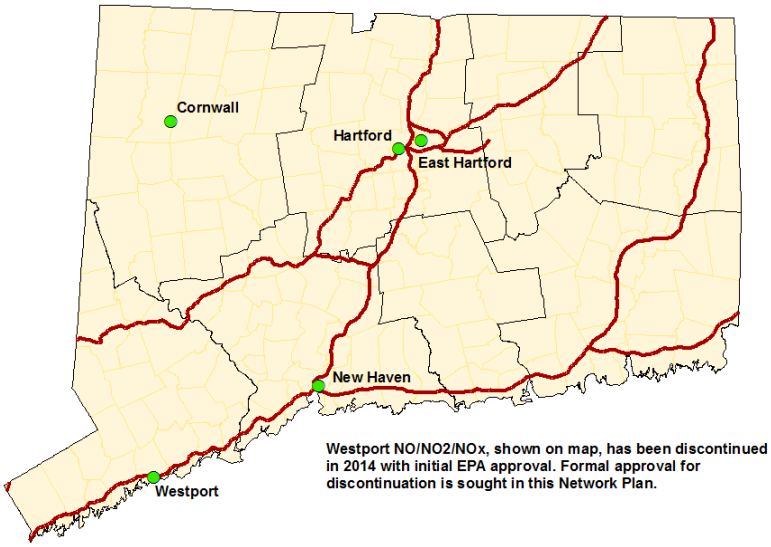


A third site, Westport Sherwood Island State Park, was discontinued at the end of 2014 with EPA Region 1 approval; however, this change in the PAMS network is formally requested in this Network Plan.

The East Hartford and New Haven sites have on-site surface meteorological monitoring, and New Haven has a ceilometer (Vaisala CL-51) that measures boundary layer height. Additional upper air measurements for ozone transport modeling are obtained from regional National Oceanic and Atmospheric Administration (NOAA) radiosondes. Carbonyl sampling at East Hartford was suspended for 2013-2014 and will continue to be suspended for 2016 due to a re-prioritization of limited funding resources. No further changes to the PAMS monitoring network are anticipated through the end of 2016.

NO_2 Network

DEEP operates four nitrogen oxide/nitrogen dioxide/total oxides of nitrogen ($NO/NO_2/NO_X$ or NO_X) sites in the air monitoring network. All NO_X analyzers are Teledyne-API Model T200U (RFNA-1194-099) and are operated year-round. DEEP also operates two nitrogen oxide/total reactive oxides of nitrogen (NO/NO_Y) TAPI model T200U/501 monitors, at Cornwall Mohawk Mt and New Haven Criscuolo Park, as part of NCore requirements. NO_Y is defined as $NO+NO_2+NO_Z$, where NO_Z represents higher oxides of nitrogen. The $NO/NO_2/NO_X$ monitor at Westport was discontinued at the end of 2014, along with PAMS VOCs, with initial EPA Region 1 approval; however, this change is formally proposed in this Network Plan.



The $NO/NO_2/NO_X$ and NO/NO_Y networks fulfill requirements for PAMS, NCore and SLAMS monitoring of these parameters. These requirements include: near-road NO_2 monitoring (Hartford), area-wide NO_2 monitoring (East Hartford), nationwide NO_2 monitoring for susceptible and vulnerable populations (New Haven), NCore NO/NO_Y monitoring (Cornwall and New Haven), PAMS $NO/NO_2/NO_X$ monitoring (East Hartford and New Haven) and NO/NO_Y monitoring at one PAMS site (New Haven). In addition, $NO/NO_2/NO_X$ is monitored at Cornwall to complement and support NO/NO_Y monitoring.

Nitrogen oxide and total reactive oxides of nitrogen (NO/NO_Y) monitoring is required at one of the PAMS sites (in addition to NCore), which should be either an upwind background (Type 1) or a maximum ozone (Type 2 or Type 3) site. The New Haven Criscuolo Park site monitor is intended to satisfy the PAMS requirement for NO/NO_Y at a Type 2 PAMS site.

Aside from discontinuing monitoring at Westport, no further changes to the NO_X network are proposed for the period 2015-2016. However, the recent NO_2 NAAQS rule changes (January 22, 2010, revised March 7, 2013) would require near-road NO_2 monitoring in the Bridgeport-Stamford and New Haven-Milford MSAs by January 1, 2017. As such, planning for these monitors would begin in late 2015, but implementation would be dependent on EPA funding.

CO Network

DEEP operates five carbon monoxide (CO) sites in the air monitoring network. All CO samplers are operated year-round and employ TE 48i- TLE analyzers (RFCA-0981-054). Of the 5 sites, New Haven and Cornwall comply with the requirement for CO monitoring at NCore sites, Hartford and Bridgeport monitor under CO limited maintenance plans, and East Hartford and New Haven include CO as a complement to PAMS monitoring.

EPA's most recent revision to the CO NAAQS rule, finalized August 12, 2011, specifies CO monitoring collocated with NO_2 near-road monitors in CBSAs with populations greater than 1,000,000. This requirement applies to the Hartford-West Hartford-East Hartford MSA. CO

monitoring at the Huntley Place site meets the local monitoring requirement for DEEP's Hartford area CO limited maintenance plan (DEEP, 2004), as well as the near-road CO monitoring requirement. No changes to the CO monitoring network are anticipated through the end of 2016.

SO_2 Network

DEEP operates four sulfur dioxide (SO_2) sites in the air monitoring network. All samplers are TE 43i-TLE SO_2 analyzers (EQSA-0486-060) and are operated year-round. Both 1-hour and 5-minute block average SO_2 data are validated and reported to EPA.

The Bridgeport Edison School and the East Hartford McAuliffe Park SO_2 monitors continue to satisfy the requirements of the June 2, 2010 SO_2 final NAAQS rule[2] for population-weighted emissions index (PWEI) monitoring in the Bridgeport-Stamford-Norwalk and Hartford-East Hartford-West Hartford CBSAs, respectively. In addition, SO_2 monitoring is required at both the Cornwall Mohawk Mountain and the New Haven Criscuolo Park NCore sites.

EPA's June 2010 SO_2 final NAAQS rule and subsequent proposed SO2 data requirements rule[3], proposed on May 13, 2014, indicate that, in addition to design values from NCore and PWEI-required monitoring, EPA may use refined dispersion modeling and/or source monitoring for SO_2 attainment designations based on source emissions and area population thresholds. Although not likely based on proposed source thresholds, it is possible that additional (source) monitoring may be required by the final rule. No changes to the SO_2 monitoring network are anticipated through the end of 2016.

Lead (Pb) Network

The DEEP Pb monitoring network consists of primary 1-in-6 day and collocated 1-in-12 day sampling at the New Haven Criscuolo Park urban NCore site in fufillment of the revised Pb NAAQS and monitoring requirements promulgated in December 2010. No additional Pb monitors are required for stationary source or airport monitoring as required by the rule.[4] Lead measurements are obtained from Energy Dispersive X-Ray Fluorescence (XRF) analysis of the 47 mm Teflon filter samples collected using a low-volume (lo-vol) FRM R&P Partisol Plus 2025 PM_{10} Sequential Air Samplers. Although the Pb NAAQS is defined as 0.15 µg/m^3 lead in total suspended particulates (TSP), Pb monitoring regulations allow surrogate monitoring of Pb in PM_{10}, providing that design values are below two-thirds of the NAAQS, or 0.10 µg/m^3. New Haven Pb values continue to remain well below this threshold, with a 2014 design value of 0.04 µg/m^3, while most monthly averages are in the range of 0.00-0.01 µg/m^3.

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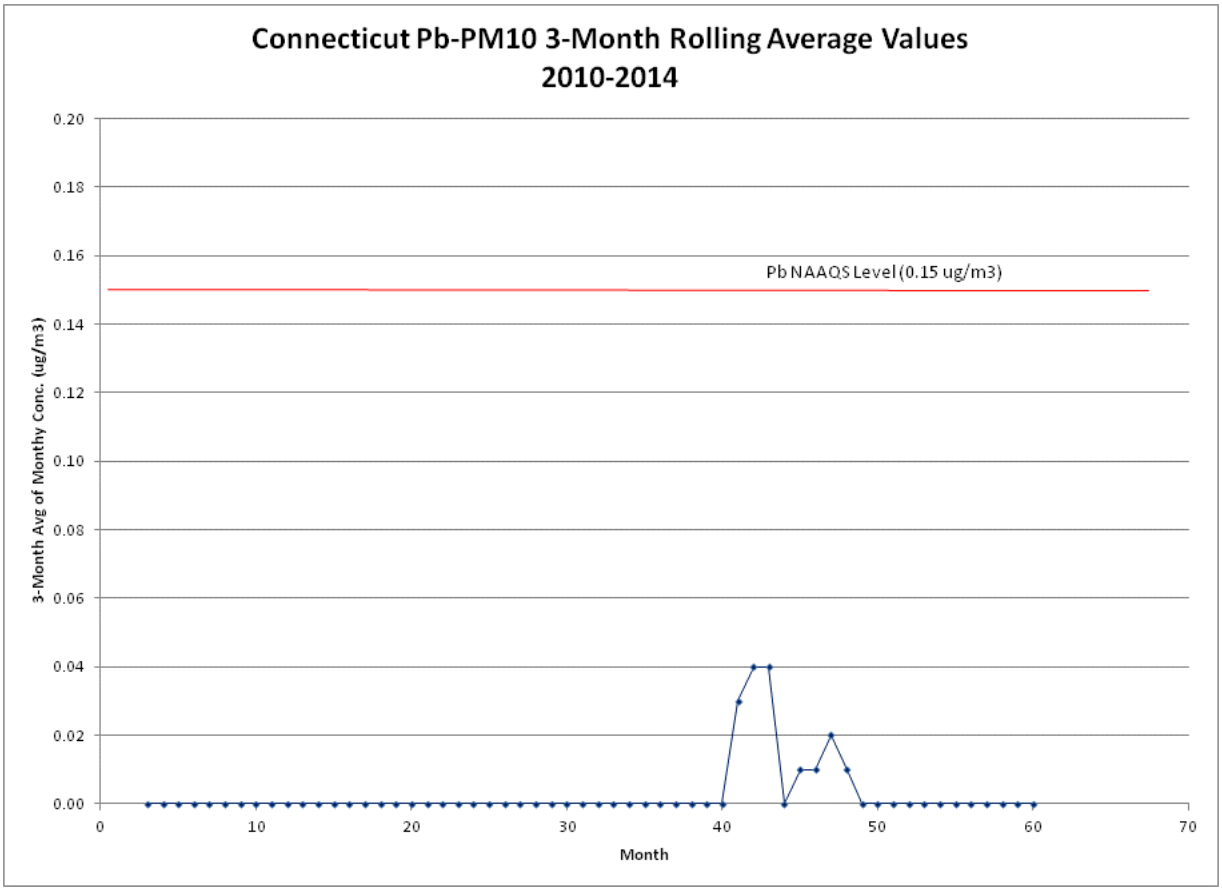
[2] http://www.epa.gov/ttn/naaqs/standards/so2/fr/20100622.pdf

[3] http://www.gpo.gov/fdsys/pkg/FR-2014-05-13/pdf/2014-09458.pdf

[4] http://www.gpo.gov/fdsys/pkg/FR-2010-12-27/pdf/2010-32153.pdf

Monitoring of Pb-PM_{10} at the New Haven site since 2010 has shown no levels of concern. In anticipation of 40 CFR Part 58 rule changes allowing discontinuation of monitoring under certain conditions, DEEP proposes to work with EPA to suspend Pb-PM_{10} monitoring at the New Haven site during 2015-2016 as allowed by the timing specified in the final amendments to 40 CFR Part 58 (pending July 1, 2015).

Figure 3: Pb-PM_{10} Monitored Levels, 2010-2014



Detailed Site Information

The following section presents detailed information for each monitoring site, such as: identification code, location, history, monitored parameters, monitoring objectives, history and descriptive information.

Town – Site:	**Pomfret – Abington**		
County:	**Windham**	Latitude:	**41.84046°**
Address:	**80 Ayers Road**	Longitude:	**-72.010368°**
AQS Site ID:	**09-015-9991**	Elevation:	**209 m (686 ft)**
Spatial Scale:	**Regional**	Year Established:	**1993**
Statistical Area:	**CBSA Willimantic, CT**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X												

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Abington site is a regional-scale site located in a rural/agricultural area in northeast Connecticut in the town of Pomfret. This site is operated by the National Park Service under the direction of EPA as part of their Clean Air Status and Trends Network (CASTNET). It is located on a hilltop approximately 2.3 km south of State Route (SR) 44 and 0.6 km east of SR 97. The site includes a portable shed located in the center of an agricultural field that is surrounded by forest. DEEP tracks ambient air quality and quality assurance data from the site but is not responsible for site operations and planning.

Monitoring Objectives: The Abington monitoring site objective is to collect ozone measurements to assess long-terms trends as part of the national CASTNET network. The site will also be used to determine compliance with the ozone NAAQS in Windham County.

Planned changes for 2015-2016: (This site is not under the operational control or purview of DEEP and is included in this Network Plan for informational purposes only.)

Town – Site:	**Bridgeport – Edison School**		
County:	**Fairfield**	Latitude:	**41.19500°**
Address:	**115 Boston Terrace**	Longitude:	**-73.16350°**
AQS Site ID:	**09-001-0012**	Elevation:	**34 m (110 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1983**

Statistical Area: **CSA (New York-Newark-Bridgeport)**

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
													X											

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Edison School site is a neighborhood-scale site located in southwestern Connecticut in the town of Bridgeport. This site is located 170 m to the north of Rte 1, 2.2 km to the north of I-95 and 2.7 km to the east of Rte 8. Residential neighborhoods are located in all directions of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Bridgeport Edison School monitoring site objective is to collect SO_2 measurements for compliance purposes and to potentially address the source-oriented monitoring requirement for the 2010 1-hour SO_2 NAAQS. The monitor satisfies the requirement for population weighted emission index (PWEI) monitoring within the Bridgeport-Stamford-Norwalk CBSA.

Planned changes for 2015-2016: None

Town – Site:	**Bridgeport – Roosevelt School**		
County:	**Fairfield**	Latitude:	**41.17086°**
Address:	**Park Avenue**	Longitude:	**-73.19476°**
AQS Site ID:	**09-001-0010**	Elevation:	**7 m (23 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1982**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3 1/6		X		1/6										X							X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Roosevelt School site is a neighborhood-scale site located in southwestern Connecticut in the town of Bridgeport. This site is located 50 m to the north of I-95 and 200 m to the west of the I-95 and Rte 8 interchange. This coastal site is located in a schoolyard and residential neighborhoods are present in every direction of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Bridgeport Roosevelt School monitoring site objectives include collecting $PM_{2.5}$ FRM measurements for compliance purposes and continuous $PM_{2.5}$ for AQI and forecasting purposes. The $PM_{2.5}$ BAM and has been designated as an FEM to be used to determine NAAQS compliance as well. CO measurements will continue to be conducted at this site per requirements of the CO limited maintenance plan (LMP).

Planned changes for 2015-2016: Change $PM_{2.5}$ FRM sampling frequency from 1/3 to 1/6 on January 1, 2016. DEEP plans to replace the shelter building during 2015-2016.

Town – Site:	**Cornwall – Mohawk Mountain**		
County:	**Litchfield**	Latitude:	**41.82140°**
Address:	**Mohawk Mountain**	Longitude:	**-73.29733°**
AQS Site ID:	**09-005-0005**	Elevation:	**505 m (1656 ft)**
Spatial Scale:	**Regional**	Year Established:	**1988**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3		P	X	1/3		X				1/3	X	X	X	X	X	X			X	X	X	X	X	

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Mohawk Mountain site is a regional-scale site located in northwestern Connecticut in the town of Cornwall. The site is located at the summit of Mohawk Mountain with an elevation of 505 m (1656 ft), and is approximately 17 km to the east of the New York border and 25 km to the south of the Massachusetts border. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The primary monitoring objectives are to meet NCore requirements for O_3, CO, SO_2, NO, NOy, $PM_{2.5}$ FRM, PM_{10} FRM, $PM_{10-2.5}$ FRM, $PM_{2.5}$ speciation, continuous $PM_{2.5}$ and surface meteorology. NO_x monitoring is conducted to support NO_y monitoring at the site. $PM_{2.5}$ chemical speciation measurements are collected through the IMPROVE network as one-in-three day 24-hour samples and by continuous analyzers for fine particulate carbon parameters (BC/UVC).

Planned changes for 2015-2016: Report continuous $PM_{2.5}$ as FEM to AQS as of January 1, 2016.

Town – Site:	**Danbury – Western Connecticut State University**		
County:	**Fairfield**	Latitude:	**41.398692°**
Address:	**White Street**	Longitude:	**-73.443148°**
AQS Site ID:	**09-001-1123**	Elevation:	**116 m (380 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1974**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3 1/6		P	X								X	X							X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Western Connecticut State University (WCSU) site is a neighborhood site located in western Connecticut in the town of Danbury. This site is located on the top level of a parking garage on the WCSU campus. This site is located approximately 140 m to the southeast of I-84 on White Street. Residential neighborhoods are located in all directions of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Danbury WCSU monitoring site objectives include collecting $PM_{2.5}$ FRM measurements for compliance purposes and continuous $PM_{2.5}$ for AQI and forecasting purposes. Ozone is measured at the Danbury site for compliance assessment and AQI forecast reporting.

Planned changes for 2015-2016: Report $PM_{2.5}$ continuous data as FEM and change $PM_{2.5}$ FRM sampling frequency from 1/3 to 1/6 as of January 1, 2016. DEEP plans to replace the shelter building during 2015-2016.

Town – Site:	**East Hartford – McAuliffe Park**		
County:	**Hartford**	Latitude:	**41.78471°**
Address:	**McAuliffe Park**	Longitude:	**-72.63158°**
AQS Site ID:	**09-003-1003**	Elevation:	**15 m (50 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1981**
Statistical Area:	**CSA (Hartford-West Hartford-Willimantic)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/1 1/6		X		1/6							X	X	X	X	X		X		X	X	X	X	X	X

X=Existing, P =Proposed, = Planned to terminate

Site Description: The McAuliffe Park site is neighborhood-scale site located in central Connecticut in the town of East Hartford. The site is located approximately 120 m to the east of Rte 5, 2.0 km to the east of I-91 and 2.5 km to the south of I-291. This site is located 3.7 km to the northeast of the city of Hartford. Residential neighborhoods are located in all directions of this site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I. DEEP upgraded the air monitoring equipment shelter during Fall of 2013, during which time most monitors experienced some data loss.

Monitoring Objectives: The East Hartford McAuliffe Park monitoring site objectives include collecting $PM_{2.5}$ FRM measurements for compliance purposes and continuous $PM_{2.5}$ for AQI and forecasting purposes. The SO2 monitor satisfies the PWEI requirement for the Hartford-West Hartford-East Hartford CBSA. A PM_{10} FRM is operated for compliance purposes, as well as to gather $PM_{10-2.5}$ measurements. Ozone is measured at the McAuliffe Park site for compliance assessment and AQI and forecast reporting. PAMS and NO_x monitoring is conducted to obtain measurements of ozone precursors. CO measurements are being collected to complement the PAMS measurements.

Planned changes for 2015-2016: Change $PM_{2.5}$ FRM sampling frequency from 1/1 to 1/6.

Town – Site:	**Greenwich – Point Park**		
County:	**Fairfield**	Latitude:	**41.005047°**
Address:	**Point Park**	Longitude:	**-73.58382°**
AQS Site ID:	**09-001-0017**	Elevation:	**3 m (10 ft)**
Spatial Scale:	**Urban**	Year Established:	**1978**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X							X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Greenwich Point Park site is an urban-scale site located is southwestern Connecticut on the Long Island Sound in Greenwich. This is a coastal site located approximately 3.0 km to the southeast and 5.0 km to the northeast of the New York border. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I .

Monitoring Objectives: The Greenwich Point Park monitoring site objectives include collecting ozone measurements for compliance assessment and AQI and forecast reporting.

Planned changes for 2015-2016: None

Town – Site:	**Groton – Fort Griswold**		
County:	**New London**	Latitude:	**41.35362°**
Address:	**141 Smith Street**	Longitude:	**-72.07882°**
AQS Site ID:	**09-011-0124**	Elevation:	**37 m (120 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**2007**
Statistical Area:	**MSA (Norwich-New London)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/6		X										X									X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Fort Griswold site is a neighborhood-scale site located in southeastern Connecticut in the town of Groton. This site is located approximately 1.1 km to the south of I-95 and 0.5 km to the east of the New London Harbor. Residential neighborhoods are located in all directions of this site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I. During 2012, the site was moved to a new shelter approximately 15 meters south of the old shelter.

Monitoring Objectives: The Groton Fort Griswold monitoring site objectives include monitoring of the two key pollutants, ozone and $PM_{2.5}$, for the southeastern part of Connecticut. Ozone is measured at the Fort Griswold site for compliance assessment and AQI and forecast reporting. $PM_{2.5}$ is currently monitored for AQI reporting and has been designated as an FEM to be used to determine NAAQS compliance.

Planned changes for 2015-2016: None

Town – Site:	**Hartford – Huntley Place**		
County:	**Hartford**	Latitude:	**41.771444°**
Address:	**10 Huntley Place**	Longitude:	**-72.679923°**
AQS Site ID:	**09-003-0025**	Elevation:	**57.2 m (187.7 ft)**
Spatial Scale:	**Near Road**	Year Established:	**2013**
Statistical Area:	**CSA (Hartford-West Hartford-Willimantic)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3		P	X			X					X			X	X			X	X	X	X		X	

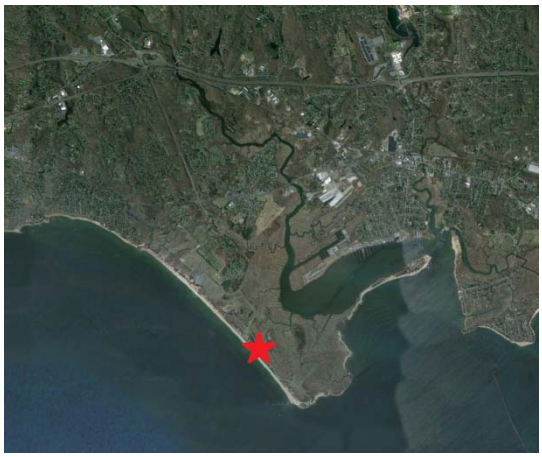
X=Existing, P =Proposed, = Planned to terminate

Site Description: The Huntley Place site is a near-road site located in north central Hartford. The site, located on the north west side of US I-84, is approximately 0.25 km to the west of the US I-91 corridor and the Founders and Buckley Bridges over the Connecticut River. Residential neighborhoods are located to the north, east and west of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Near Road monitoring objective will focus monitoring resources to capture short-term NO_2 concentrations near heavily trafficked roads, to assess area-wide NO_2 concentrations, and to assess NO_2 concentrations for vulnerable and susceptible populations in adjacent neighborhoods. The data will be also used to help determine compliance with the 1-hour NO_2 NAAQS as established by EPA in 2010. This site also collects CO, continuous $PM_{2.5}$ & PM_{10} (BAM), BC/UVC and traffic counts. DEEP is began operating a PM2.5 FRM sampler at the site in March, 2014.

Planned changes for 2015-2016: Report continuous $PM_{2.5}$ as FEM to AQS as of January 1, 2016.

Town – Site:	**Madison – Hammonasset State Park**		
County:	**New Haven**	Latitude:	**41.25984°**
Address:	**Hammonasset SP**	Longitude:	**-72.55018°**
AQS Site ID:	**09-009-9002**	Elevation:	**3 m (10 ft)**
Spatial Scale:	**Regional**	Year Established:	**1981**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		



PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	$NO/NO_2/NOx$	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X							X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Hammonasset State Park site is a regional-scale site located in central coastal Connecticut in the town of Madison. This site is located approximately 1.5 km to the south of Rte 1 and 3.0 km to the south of I-95 on the Long Island Sound. Residential neighborhoods are located primarily to the northeast, north and northwest of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I. On August 30, 2012, the site was relocated approximately 450 meters to the southwest within the park due to storm damage at the previous location. The previous AQS ID was 09-009-3002.

Monitoring Objectives: The Madison Hammonasset State Park monitoring site objective is to collect ozone measurements for compliance assessment and AQI forecast reporting.

Planned changes for 2015-2016: None

Town – Site:	**Middletown – Central Valley Hospital**		
County:	**Middlesex**	Latitude:	**41.55224°**
Address:	**Shew Hall**	Longitude:	**-72.63004°**
AQS Site ID:	**09-007-0007**	Elevation:	**58 m (190 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1980**
Statistical Area:	**CSA (Hartford-West Hartford-Willimantic)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	$NO/NO_2/NOx$	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X							X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Middletown Central Valley Hospital site is a neighborhood-scale site located in central Connecticut. This site is located approximately 0.2 km to the east of Rte 9. Residential neighborhoods are located to the west, north and south of this site. This site meets all siting requirements and criteria with the exception of the height requirement. A height requirement waiver has been approved and granted by EPA Region I and EPA Headquarters. This site has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Middletown Central Valley Hospital monitoring site objective is to collect ozone measurements for compliance assessment and AQI forecast reporting.

Planned changes for 2015-2016: None

Town – Site:	**New Haven – Criscuolo Park**		
County:	**New Haven**	Latitude:	**41.30117°**
Address:	**1 James Street**	Longitude:	**-72.90288°**
AQS Site ID:	**09-009-0027**	Elevation:	**3 m (10 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**2004**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/1 1/3	1/6	P	X	1/3	1/6	X	1/6	1/12	1/3		X	X	X	X	X	X	X		X	X	X	X	X	X

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Criscuolo Park site is a neighborhood-scale site located on the western side of the city of New Haven. The site is approximately 0.25 km to the north of the I-95 Quinnipiac River Bridge. The site is approximately 1.0 km to the east of the I-91 and I-95 interchange. Bulk gasoline transfer stations are located 0.3 to 2.0 km to the south of the site. Residential neighborhoods are located to the west, north and east of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The primary monitoring objectives are to meet NCore requirements for O_3, CO, SO2, NO, NOy, $PM_{2.5}$ FRM, PM_{10} FRM, $PM_{10\text{-}2.5}$ FRM, Pb, $PM_{2.5}$ speciation, continuous $PM_{2.5}$ and surface meteorology. NO_x monitoring is conducted to support NO_y monitoring at the site and in partial fulfillment of the requirement for NO_2 monitoring of vulnerable and sensitive populations 40 nationwide sites selected by the Regional Administrators. $PM_{2.5}$ chemical speciation measurements are collected through the Chemical Speciation Network (CSN) as one-in-three day 24-hour samples and by continuous analyzers for fine particulate carbon parameters (BC/UVC and EC/OC) and sulfate. Ozone is measured at the Criscuolo Park site for compliance assessment and AQI forecast reporting. PAMS and NO_x monitoring is conducted to obtain measurements of ozone precursors.

Planned changes for 2015-2016: Change $PM_{2.5}$ FRM sampling frequency from 1/1 to 1/3 and report continuous $PM_{2.5}$ as FEM to AQS as of January 1, 2016. Discontinue Pb-PM_{10} sampling during 2015-2016 as allowed by 40 CFR 58 final rule (pending as of July 1, 2015).

Town – Site:	**Stafford – Shenipsit State Forest**		
County:	**Tolland**	Latitude:	**41.97568°**
Address:	**Route 190**	Longitude:	**-72.38674°**
AQS Site ID:	**09-013-1001**	Elevation:	**265 m (869 ft)**
Spatial Scale:	**Regional**	Year Established:	**1980**
Statistical Area:	**CBSA (Hartford-West Hartford-Willimantic)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	$NO/NO_2/NOx$	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X							X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Shenipsit State Forest site is a regional-scale site that is located in northern Connecticut in the town of Stafford. The site is approximately 100 m to the south of Rte 190, 17 km to the east of I-91 and 12 km to the northwest of I-84. This site is located 34 km to the northeast of the city of Hartford. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Stafford Shenipsit State Forest monitoring site objective is to collect ozone measurements for compliance assessment and AQI forecasting purposes.

Planned changes for 2015-2016: None

Town – Site:	**Stratford – Lighthouse**		
County:	**Fairfield**	Latitude:	**41.15181°**
Address:	**Prospect Drive**	Longitude:	**-73.10334°**
AQS Site ID:	**09-001-3007**	Elevation:	**3 m (10 ft)**
Spatial Scale:	**Regional**	Year Established:	**1980**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
												X									X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Stratford Lighthouse site is a regional-scale site located in southwestern Connecticut in the town of Stratford. This is a coastal site that is located 4.5 km to the southeast of I-95 and is directly on the Long Island Sound. This site is approximately 45 km to the northeast of the New York border. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Stratford Lighthouse monitoring site objective is to collect ozone measurements for compliance assessment and AQI forecasting purposes.

Planned changes for 2015-2016: None

Town – Site:	**Waterbury – Meadow & Bank Street**		
County:	**New Haven**	Latitude:	**41.55046°**
Address:	**Meadow & Bank**	Longitude:	**-73.04365°**
AQS Site ID:	**09-009-2123**	Elevation:	**80 m (269 ft)**
Spatial Scale:	**Neighborhood**	Year Established:	**1975**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	$NO/NO_2/NOx$	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3 1/6	1/6	X																	X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Waterbury site is a neighborhood-scale site located in western Connecticut at Meadow Street and Bank Street in the Naugatuck River Valley. This site is approximately 170 m to the south of I-84, 300 m to the east of Rte 8 and 0.75 km to the east of the I-84 and Rte 8 interchange. Residential neighborhoods are located in all directions of the site. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

Monitoring Objectives: The Waterbury Meadow & Bank Street site monitoring objectives include collecting $PM_{2.5}$ FRM measurements for compliance purposes and continuous $PM_{2.5}$ for AQI forecast reporting. The $PM_{2.5}$ BAM and has been designated as an FEM to be used to determine NAAQS compliance as well. A collocated FRM sampler is operated at this site to gather FRM precision data.

Planned changes for 2015-2016: Change $PM_{2.5}$ FRM sampling frequency from 1/3 to 1/6 on January 1, 2016. DEEP plans to replace the shelter building during 2015-2016.

Town – Site:	**Westport – Sherwood Island State Park**		
County:	**Fairfield**	Latitude:	**41.11822°**
Address:	**Sherwood Island SP**	Longitude:	**-73.33681°**
AQS Site ID:	**09-001-9003**	Elevation:	**4 m (13 ft)**
Spatial Scale:	**Regional**	Year Established:	**1996**
Statistical Area:	**CSA (New York-Newark-Bridgeport)**		

PM2.5 (FRM)	PM2.5 (FRM, Collocated)	PM2.5 (Continuous - FEM)	PM2.5 (Continuous – non-FEM)	PM10/PM-Coarse (FRM)	PM10/PM-Coarse (FRM, Collocated)	PM10/PM-Coarse (Continuous)	Lead-PM10	Lead-PM10 (Collocated)	PM Speciation (CSN)	PM Speciation (IMPROVE)	PM2.5 Carbon (BC/UVC, Continuous)	Ozone	SO2	CO	NO/NO_2/NOx	NOy	VOCs (PAMS)	Traffic Count	Wind Speed	Wind Direction	Temperature	Dew Point / Rel. Humidity	Barometric Pressure	Solar Radiation
1/3												X			X		X		X	X	X			

X=Existing, P =Proposed, = Planned to terminate

Site Description: The Westport Sherwood Island State Park site is a regional-scale site located in southwestern Connecticut. This is a coastal site that is approximately 0.5 km to the south of I-95 on the Long Island Sound. This site meets all siting requirements and criteria and has been approved internally by DEEP and independently by EPA Region I.

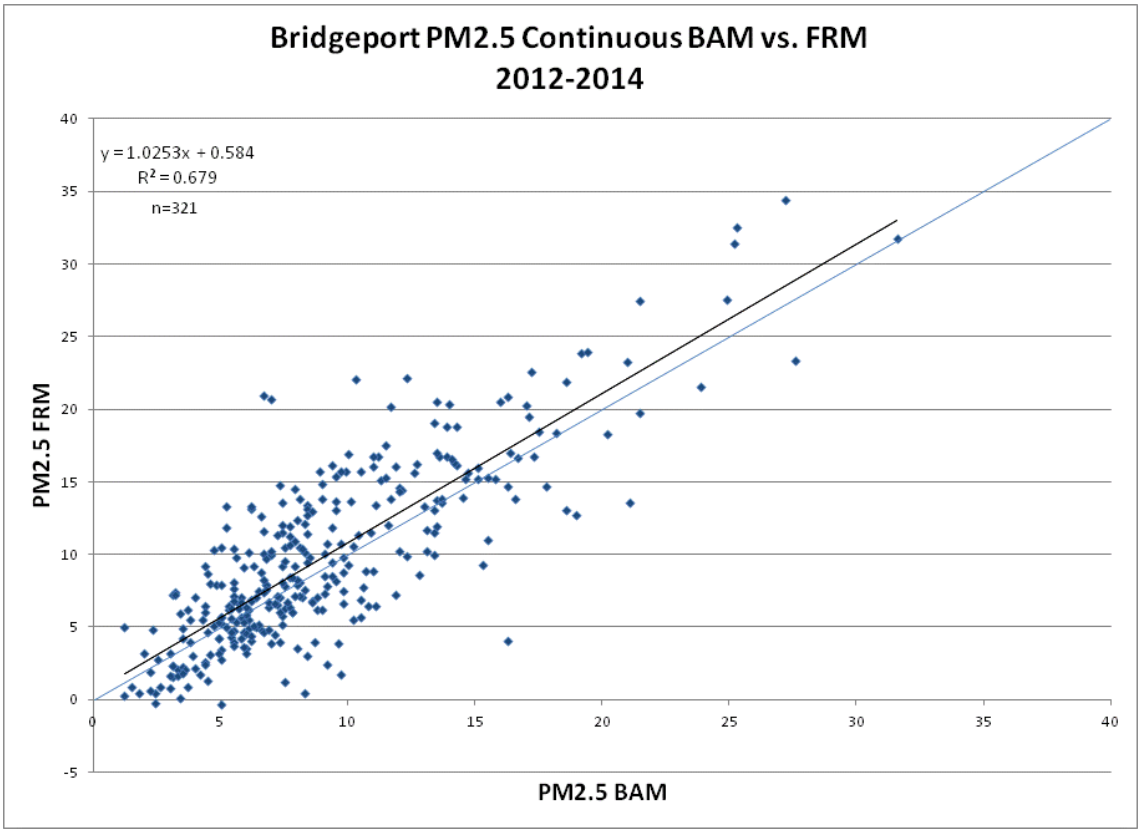
Monitoring Objectives: Ozone is measured at the Westport site for compliance assessment and AQI forecast reporting.

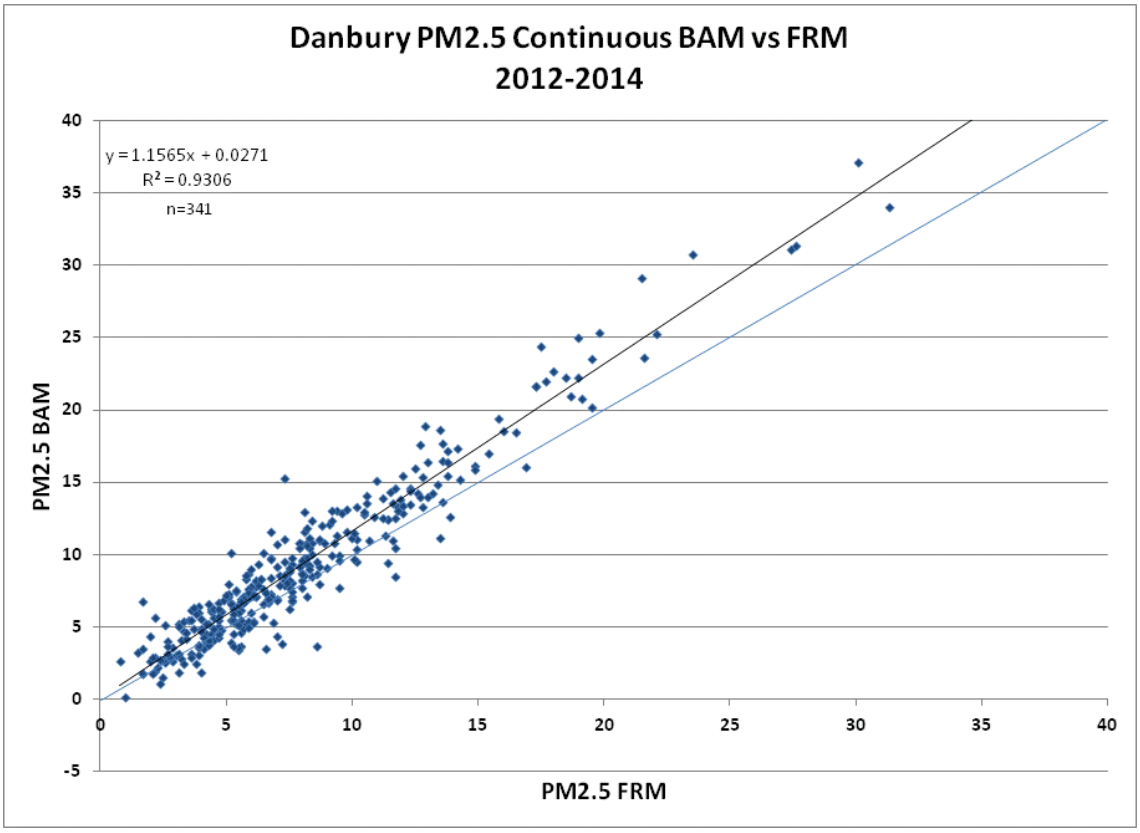
Planned changes for 2015-2016: PAMS VOC and NO/NO2/NOx monitoring was discontinued December 31, 2014. Proposed to discontinue $PM_{2.5}$ FRM sampling on December 31, 2015.

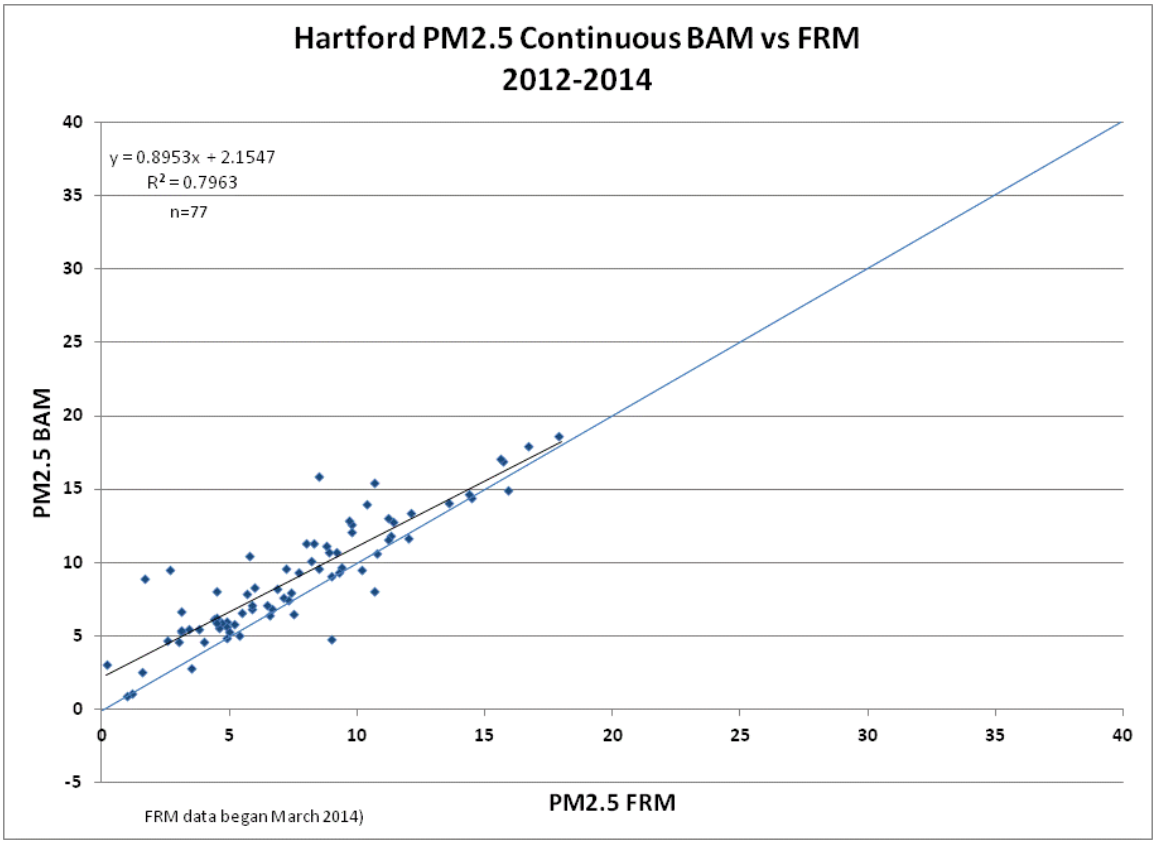
References

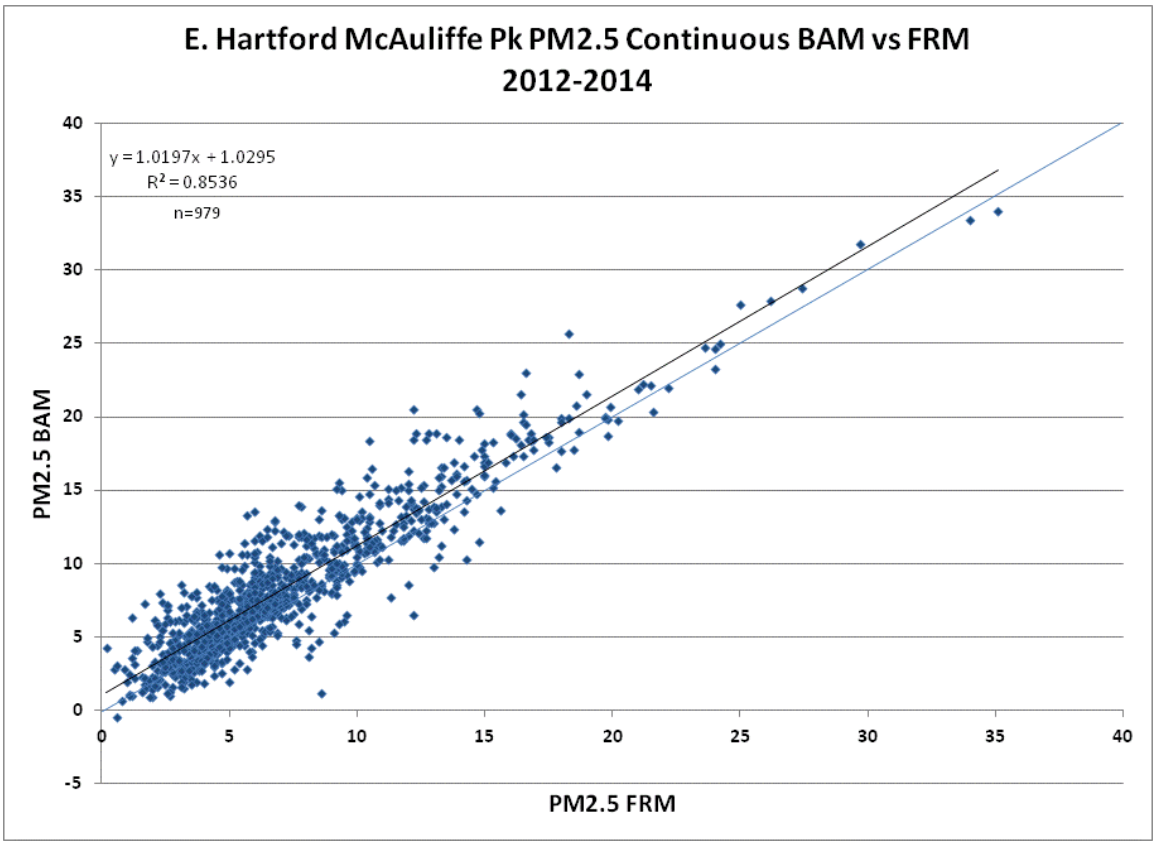
Connecticut Department of Environmental Protection (2004). Limited Maintenance Plans for the Hartford, the New Haven, and the Connecticut Portion of the New York/New Jersey/Connecticut Carbon Monoxide Maintenance Areas. June 18, 2004

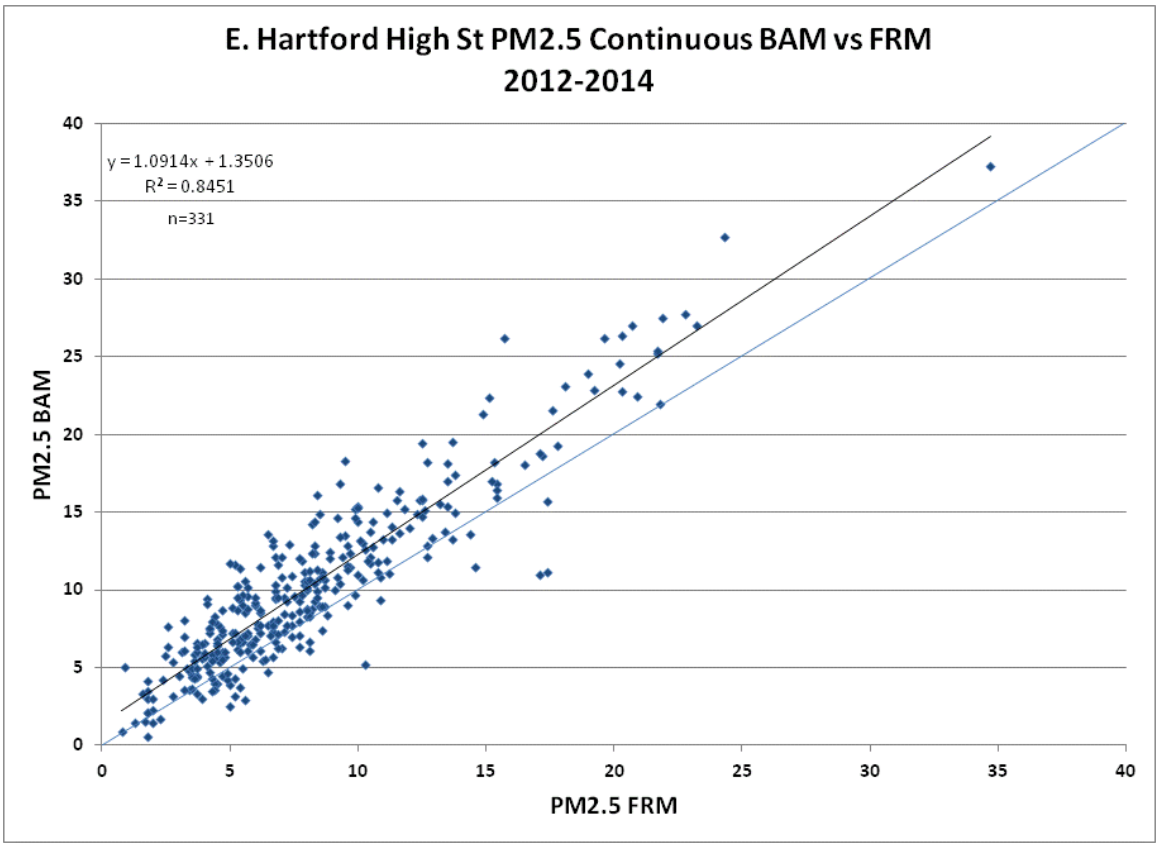
Appendix A PM2.5 FRM vs Continuous Correlation Charts

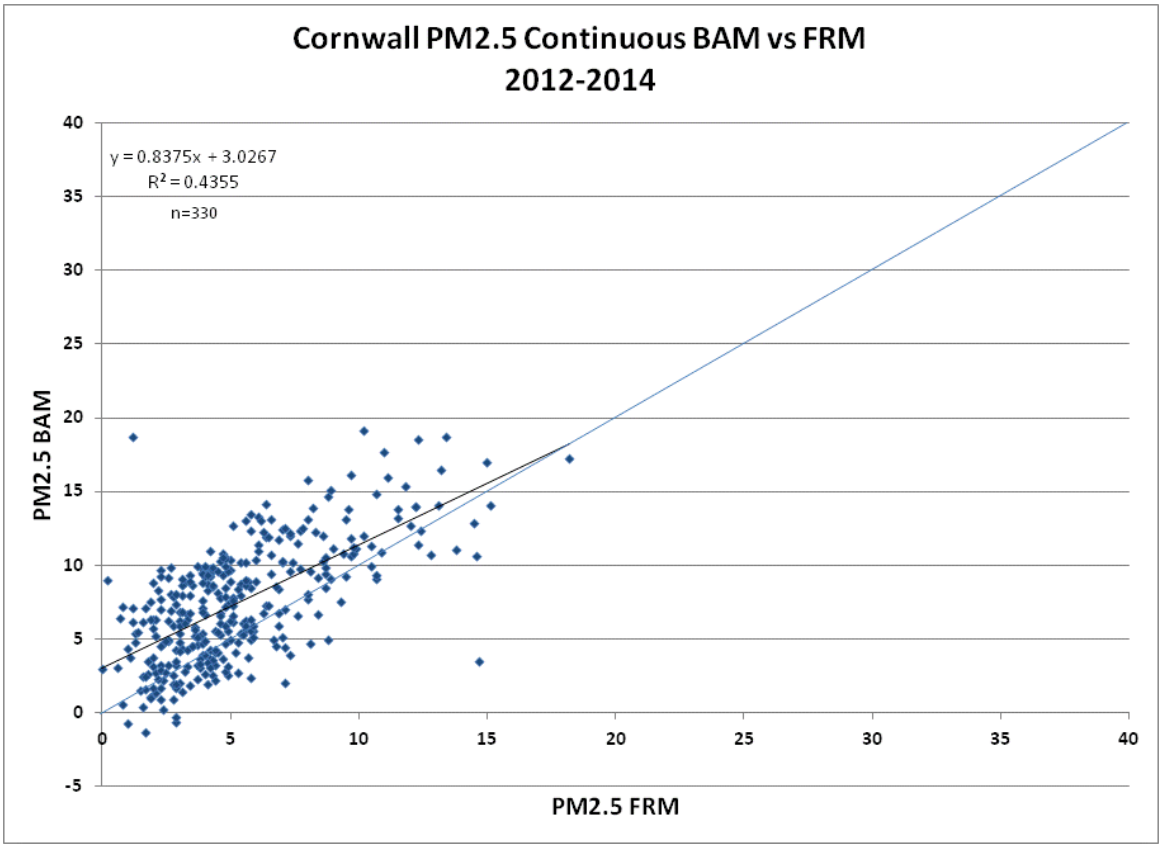

Bridgeport PM2.5 Continuous BAM vs. FRM
2012-2014
y = 1.0253x + 0.584
R² = 0.679
n=321
PM2.5 FRM
PM2.5 BAM
40
35
30
25
20
15
10
5
0
-5
0
5
10
15
20
25
30
35
40

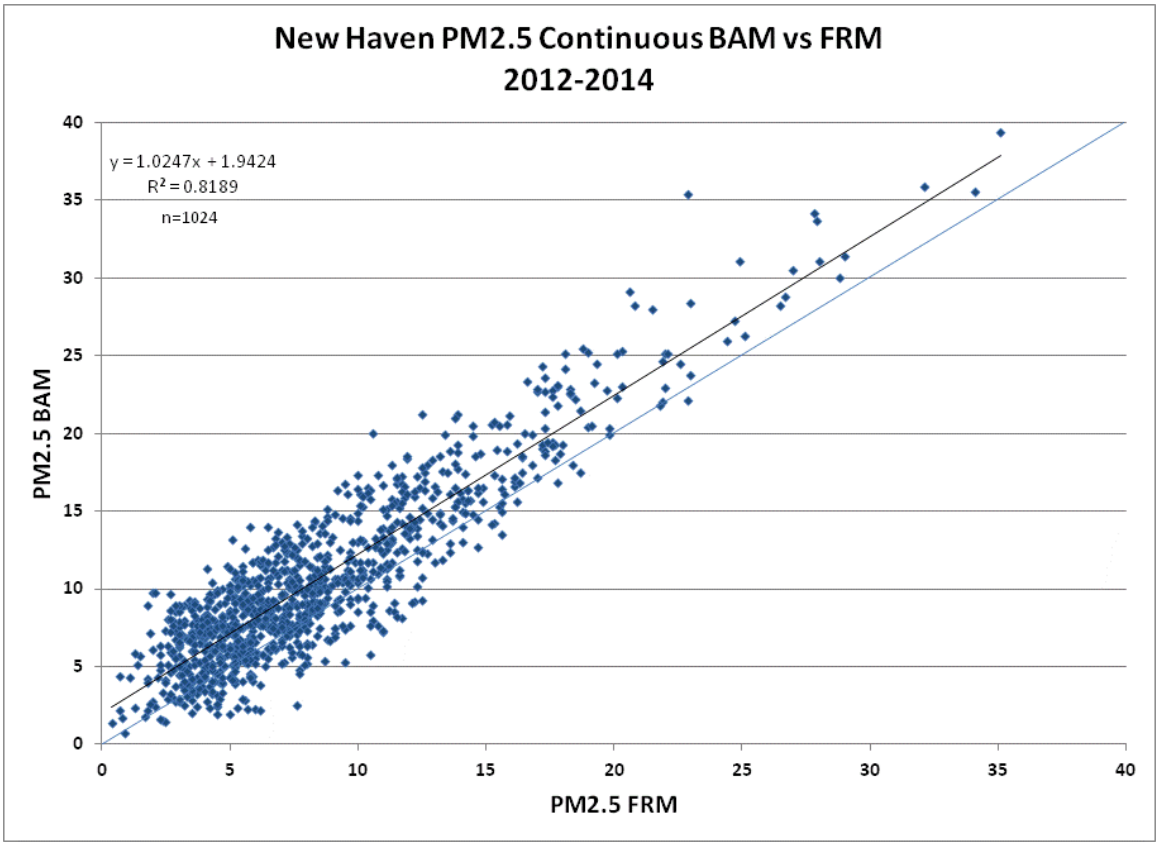

Danbury PM2.5 Continuous BAM vs FRM
2012-2014
y = 1.1565x + 0.0271
R² = 0.9306
n=341
PM2.5 BAM
PM2.5 FRM
40
35
30
25
20
15
10
5
0
-5
0
5
10
15
20
25
30
35
40

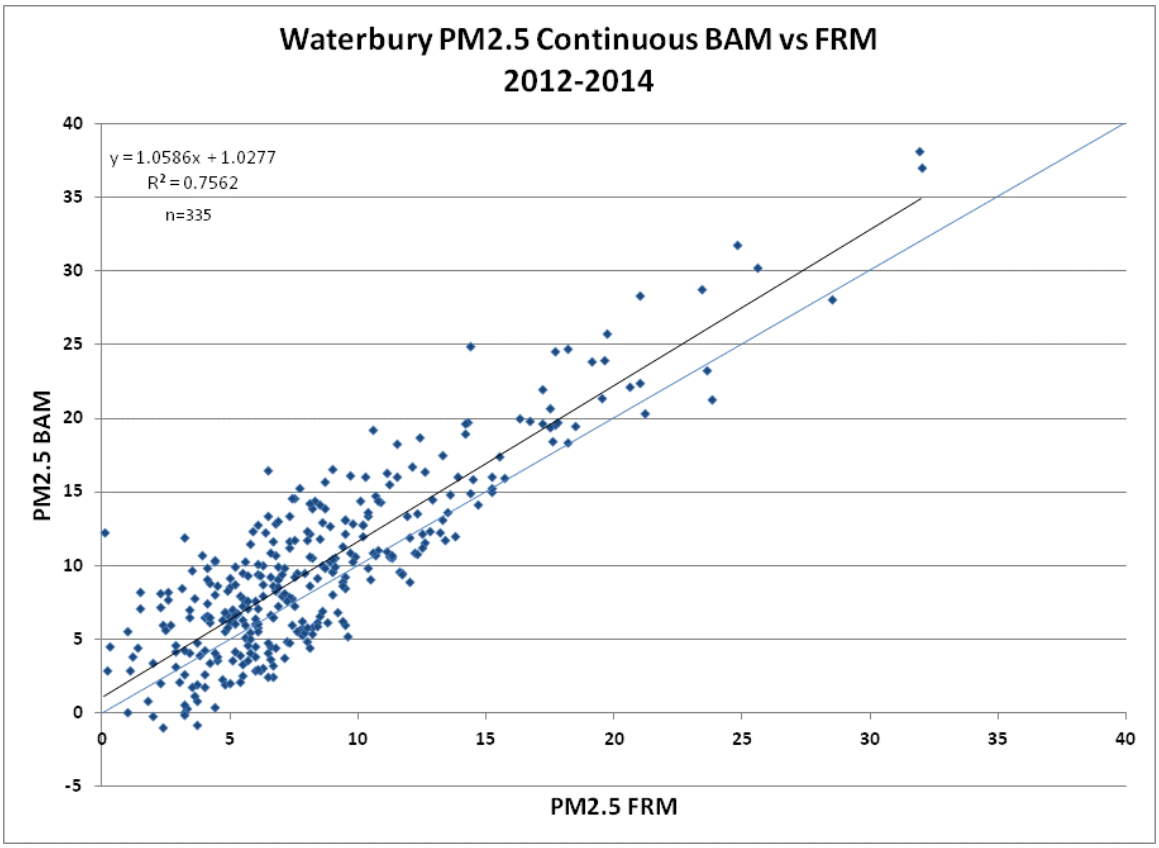

Hartford PM2.5 Continuous BAM vs FRM
2012-2014
y = 0.8953x + 2.1547
R² = 0.7963
n=77
PM2.5 BAM
PM2.5 FRM
FRM data began March 2014)


E. Hartford McAuliffe Pk PM2.5 Continuous BAM vs FRM
2012-2014
y = 1.0197x + 1.0295
R² = 0.8536
n=979
PM2.5 BAM
PM2.5 FRM


E. Hartford High St PM2.5 Continuous BAM vs FRM
2012-2014
y = 1.0914x + 1.3506
R² = 0.8451
n=331
PM2.5 BAM
PM2.5 FRM
0
5
10
15
20
25
30
35
40


Cornwall PM2.5 Continuous BAM vs FRM
2012-2014
y = 0.8375x + 3.0267
R² = 0.4355
n=330
PM2.5 BAM
PM2.5 FRM
-5
0
5
10
15
20
25
30
35
40


New Haven PM2.5 Continuous BAM vs FRM
2012-2014
y = 1.0247x + 1.9424
R² = 0.8189
n=1024
PM2.5 BAM
PM2.5 FRM
0
5
10
15
20
25
30
35
40


Waterbury PM2.5 Continuous BAM vs FRM
2012-2014
y = 1.0586x + 1.0277
R² = 0.7562
n=335
PM2.5 BAM
PM2.5 FRM
-5
0
5
10
15
20
25
30
35
40

Appendix B Public Comments Received With DEEP Responses

Response to EPA-New England June 3, 2015 Comments on Network Plan

DEEP acknowledges the following numbered comments that do not require a specific response or Network Plan edits: 1, 3, 5, 6, and 7. DEEP's responses to the remaining comments are given below.

2. DEEP had proposed to discontinue lead (Pb-PM_{10}) sampling on September 30, 2015. We acknowledge that shutdown of this monitor is contingent on the timing and final language of EPA's 40 CFR Part 58 rulemaking. This has been clarified in the Lead Network discussion section on page 19 and in the New Haven monitoring summary on page 31.

4. The monitoring objectives for the Westport station have been edited to remove references to ozone (page 35), NO_X and VOC monitoring. DEEP will consider adding VOC monitoring to the Hartford near road site in the future, but does not propose to do so within the time frame of this Network Plan.

8. Language has been added in the SO_2 Network discussion (page 18) that allows that the SO_2 Data Requirements Rule may require additional monitoring.

9. The color coding errors in the Cornwall monitoring summary chart on page 23 have been corrected to show $PM_{2.5}$ (continuous FEM) as "proposed" and $PM_{2.5}$ (continuous non-FEM) as "planned to terminate."

10. The date for the planned $PM_{2.5}$ sampling frequency changes at Waterbury has been corrected to January 1, 2016.