

2012

ANNUAL MONITORING NETWORK PLAN

New York State Ambient Air Monitoring Program

Bureau of Air Quality Surveillance
Division of Air Resources
New York State Department of Environmental Conservation

Table of Contents

<u>Section</u>	<u>Page</u>
1. Introduction	8
1.1 Background	8
1.2 Topography and Climate of New York State	11
1.3 Population and Demographics	12
2. Chronology of Air Monitoring in New York State	15
2.1 Monitoring Related Research and Investigations	17
2.1.1 Publications	18
2.1.2 Posters/Presentations	22
3. Monitoring Sites	28
3.1 Northern Monitoring Site Listings	31
3.2 Southern Monitoring Site Listings	107
4. Criteria Contaminants	164
4.1 Carbon Monoxide	166
4.2 Nitrogen Dioxide	169
4.3 Lead	172
4.4 Particulate Matter	174
4.4.1 Total Suspended Particulate	174
4.4.2 PM ₁₀	176
4.4.3 PM _{2.5}	177
4.4.4 Continuous PM Monitoring	182
4.4.5 Speciation	184
4.4.6 Continuous Speciation	185
4.4.7 Additional Monitoring Initiatives	186
4.4.7.1 PM _{2.5} Technology Assessment and Characterization Study-New York Supersite	187
4.4.7.2 Organic Carbon: Molecular Marker Characterization	187
4.4.7.3 PM Coarse Monitoring	188
4.4.8 Air Pollution and Environmental Conditions	188
4.4.8.1 NYC Micro-scale Street Canyon Monitoring	188
4.4.8.2 Rochester PM Center Clarkson, Univ. of Rochester Medical Center	188
4.4.8.3 Air Pollution Microscopy	188
4.4.8.4 Ultrafine Particulate Monitoring	189
4.5 Sulfur Dioxide	190
4.6 Ozone	194
5. EPA's National Toxics Program	198
5.1 National Air Toxics Trends Stations (NATTS)	199
5.2 NY Toxics Monitoring Network	200
5.3 Photochemical Assessment Monitoring Stations (PAMS)	209
6. NCore Sites	214
7. Acid Deposition Network	216

Table of Contents (continued)

<u>Section</u>	<u>Page</u>
8. Anticipated Changes in the Next 18 Months	220
8.1 Lead Monitoring	220
8.2 Special Purpose Monitors	220
8.2.1 Tonawanda Community Air Quality Study	220
8.2.2 New York State Ambient Mercury Baseline Study	222
8.2.3 Community Air Screen	222
8.3 Proposed Changes at Existing Sites	222
8.3.1 Site Closures	223
8.3.1.1 Belleayre	223
8.3.1.2 Camden	223
8.3.1.3 Camp Georgetown	223
8.3.1.4 Elmira	223
8.3.1.5 Grafton Lakes State Park	223
8.3.1.6 IS 293	223
8.3.1.7 La Tourette	223
8.3.1.8 Manhattenville Post Office	223
8.3.1.9 Niagara Falls	223
8.3.1.10 Nick's Lake	224
8.3.1.11 PS 154	224
8.3.1.12 Syracuse COM	224
8.3.1.13 Westfield	224
8.3.2 Streamlining of Monitored Parameters	224
8.3.2.1 Amherst	224
8.3.2.2 Eisenhower Park	224
8.3.2.3 Mt. Ninham	224
8.3.2.4 New York Botanical Garden	224
8.3.2.5 PS 19	224

List of Tables

<u>Table</u>	<u>Page</u>
1.1	2010 Census Population for Major Metropolitan Statistical Areas in New York 12
3.1	Location Listing for Northern Monitoring Sites 31
3.2	Location Listing for Southern Monitoring Sites 107
4.1	National Ambient Air Quality Standards 164
5.1	NATTS Pollutants of Concern 199
5.2	Target List of Volatile Organic Compounds 200
5.3	Information on PAMS Sites 209
5.4	Instrumentation for Gaseous Pollutants 210
5.5	Equipment for Meteorological Measurements 210
5.6	Target Compound List for Carbonyl Sampling 211
5.7	VOC Methods and Sampling Frequencies 211
5.8	PAMS Target Compounds List 211
7.1	Acid Deposition Target Ions List 216

List of Figures

<u>Figure</u>	<u>Page</u>
1.1	Population Density in New York State by County 13
1.2	Potential Environmental Justice Areas in New York State 14
2.1	Location Map of Monitoring Sites in New York State Excluding NYC 16
2.2	Location Map of Ambient Air Monitoring Sites in NYC 17
3.1	Site Locations for Northern Monitoring Operation 29
3.2	Site Locations for Southern Monitoring Operation 30
4.1	Carbon Monoxide Monitors and Concentration Trends..... 167
4.2	Location Map for Carbon Monoxide Monitoring Sites 168
4.3	Nitrogen Dioxide Monitors and Concentration Trends 170
4.4	Location Map for NO _x Monitoring Sites 171
4.5	Lead Monitors and Concentration Trends 174
4.6	Total Suspended Particulate Monitors and Concentration Trends 175
4.7	PM ₁₀ Monitors and Concentration Trends 176
4.8	Location Map of Manual PM ₁₀ Monitoring Sites 177
4.9	Location Map of Manual PM _{2.5} Monitoring Sites 181
4.10	PM _{2.5} Monitors and Concentration Trends 182
4.11	Location Map of Continuous TEOM Monitoring Sites 183
4.12	Location Map of Speciation Trends Network Sites 185
4.13	Sulfur Dioxide Monitors and Concentration Trends 191
4.14	Location Map of Sulfur Dioxide Monitoring Sites 193
4.15	Ozone Monitors and 1 hr Concentration Trends 196
4.16	Ozone Monitors and 8 hr Concentration Trends 196
4.17	Location Map of Ozone Monitoring Sites 197
5.1	Annual Averages for Benzene 202
5.2	Annual Averages for Toluene 203
5.3	Annual Averages for m/p-Xylene 203
5.4	Annual Averages for o-Xylene 204
5.5	Annual Averages for 1,3-Butadiene 204
5.6	Annual Averages for Dichloromethane 205
5.7	Annual Averages for Chloroform 205
5.8	Annual Averages for Tetrachloroethene 206
5.9	Annual Averages for 1,4-Dichlorobenzene 206
5.10	Annual Averages for Formaldehyde 207
5.11	Annual Averages for Acetaldehyde 207
5.12	Location Map of Toxics Monitoring Sites 208
7.1	Statewide Concentration Trends Chart for pH 217
7.2	Statewide Concentration Trends Chart for Sulfate 217
7.3	Statewide Concentration Trends Chart for Nitrate 218
7.4	Location Map of Acid Deposition Monitoring Sites 219
8.1	Annual Averages for Benzene at Tonawanda Sites 221
8.2	Annual Averages for Formaldehyde at Tonawanda Sites 221

List of Acronyms and Abbreviations

AIRS	Aerometric Information Retrieval System
AQI	Air Quality Index
AQS	Air Quality System
ARM	Approved Regional Method
ASRC	Atmospheric Sciences Research Center
BAQS	Bureau of Air Quality Surveillance
CAMR	Clean Air Mercury Rule
CBSA	Core-Based Statistical Area
CCNY	City College of New York
CFR	Code of Federal Regulations
CMSA	Consolidated Metropolitan Statistical Area
CO	Carbon Monoxide
Cr	Chromium
CSN	Chemical Speciation Network
CTDEP	Connecticut Department of Environmental Protection
DNPH	2,4-Dinitrophenyl hydrazine
EAC	Early Action Compact
EC	Elemental Carbon
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GC	Gas Chromatography
GCMS	Gas Chromatography/Mass Spectrometry
HAPs	Hazardous Air Pollutants
HPLC	High Performance Liquid Chromatography
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
IMPROVE	Interagency Monitoring of Protected Visual Environments
MDN	Mercury Deposition Network
NAAQS	National Ambient Air Quality Standards
NADP	National Atmospheric Deposition Program
NATTS	National Air Toxics Trends Stations
NCore	National Core
NESCAUM	New England States Coordinated Air Use Management
NJDEP	New Jersey Department of Environmental Protection
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NO _y	Sum of reactive nitrogen oxides
NSR	New Source Review
NYC	New York City
NYCRR	New York State Codes, Rules and Regulations

List of Acronyms and Abbreviations (continued)

NYSERDA	New York State Energy Research and Development Authority
O ₃	Ozone
OC	Organic Carbon
ORD	Office of Research and Development (EPA)
PAHs	Polycyclic Aromatic Hydrocarbons
PAMS	Photochemical Assessment Monitoring Stations
Pb	Lead
PM	Particulate Matter
PM ₁₀	Particulate Matter with an aerodynamic diameter of 10 microns or less
PM _{2.5}	Particulate Matter with an aerodynamic diameter of 2.5 microns or less
PMTACS	PM _{2.5} Technology Assessment and Characterization Study
ppb	Parts per billion
ppm	Parts per million
PUF	Polyurethane Foam
PWEI	Population Weighted Emissions Index
SADCA	State Acid Deposition Control Act
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO ₂	Sulfur dioxide
SOAP	Speciation of Organics for Apportionment of PM _{2.5}
SO _x	Sulfur oxides
SPM	Special Purpose Monitors
SUNY	State University of New York
TEOM	Tapered Element Oscillating Microbalance
TSP	Total Suspended Particulate
UV	Ultra Violet
VOCs	Volatile Organic Compounds

1. Introduction

The U.S. Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations on October 17, 2006. The amendments revise the technical requirements for certain types of sites, add provisions for monitoring of PM_{10-2.5}, and reduce certain monitoring requirements for criteria pollutants. Monitoring agencies are required to submit annual monitoring network plans, conduct network assessments every 5 years, perform quality assurance activities, and, in certain instances, establish NCore sites by January 1, 2011.

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.” This document is prepared and submitted as part of the fulfillment to these requirements.

1.1 Background

New York State began a concerted effort to control the air pollution problem back in 1957, when the State Legislature enacted one of the nation’s first comprehensive air pollution control laws. An Air Pollution Control Board was established to develop and direct a public information program for monitoring contaminant levels, and to conduct area studies and inventories outlining major problems. In December 1964, New York State developed air quality standards to protect its citizens against adverse health effects. These standards provided a long-range planning tool and established numerical air quality limits for the following contaminants: particulates, sulfur dioxide, carbon monoxide, oxidants, hydrogen sulfide, fluoride, beryllium and sulfuric acid mist.

In 1966 the Legislature responded to the increasing pollution levels by restructuring the administrative authority into the Department of Health, under which the Division of Air Resources was created. Major legislation was also introduced to provide increased efficacy of rules and regulations. That year also marked the severe New York City Thanksgiving holiday air pollution episode brought upon by a temperature inversion that lasted through the weekend.

By the time when the first Earth Day was held in 1970, it had become apparent that pollution abatement strategies in place were inadequate, and air quality—along with water quality and solid waste—became cornerstones of the emerging U.S. environmental conscience. The 1970 Clean Air Act Extension, along with the establishment of the U.S. Environmental Protection Agency in that same year, were defining moments in the history of air quality in this country.

Another development which has had a major effect on air pollution control in New York State was the creation of the Department of Environmental Conservation in 1970. The Division of Air Resources was transferred to the new Department and its administrative functions restructured and streamlined. Nine new regional offices were established to carry out responsibilities relating to pollution control of sources within their respective part of the State.

In 1977, the first set of Clean Air Act amendments was adopted because many states failed to meet mandated targets. One of the most effective of these was the New Source Review (NSR), which addresses older facilities that had been "grandfathered" by the original law. In 1990, additional amendments to the Clean Air Act included provisions for attainment and maintenance of national ambient air quality standards, mobile sources, air toxics, acid deposition control, permits, stratospheric ozone and global climate protection, enforcement; visibility improvement near National Parks, and other provisions relating to research, development and air monitoring.

In 1997, EPA announced more strict national ambient air quality standards (NAAQS) for ground-level ozone, the primary constituent of smog. After a lengthy scientific review process, including extensive external scientific review, EPA determined that these changes were necessary to protect public health and the environment. The new standard was intended to be more protective of the health of children and adults who play and work outdoors in the summer. In establishing the 8-hour standard, EPA set the standard at 0.08 parts per million (ppm) as an average over an 8-hour period and defines the new standard as a "concentration-based" form, specifically the 3-year average of the annual 4th-highest daily maximum 8-hour ozone concentrations. EPA also added new standards, using PM_{2.5} as the indicator for fine particles (with PM_{2.5} referring to particles with a nominal mean aerodynamic diameter less than or equal to 2.5 µm), and retained PM₁₀ standards for the purpose of regulating the coarse fraction of PM₁₀ (referred to as thoracic coarse particles or coarse-fraction particles, generally including particles with a nominal mean aerodynamic diameter greater than 2.5 µm and less than or equal to 10 µm, or PM_{10-2.5}). EPA established two new PM_{2.5} standards: an annual standard of 15 µg/m³ based on the 3-year average of annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors; and a 24-hour standard of 65 µg/m³, based on the 3-year average of the 98th percentile of 24-hour PM_{2.5} concentrations at each population-oriented monitor within an area. These new standards were challenged by industry and in May of 1999 the U.S. Court of Appeals for the District of Columbia Circuit Court ruled that U.S. EPA must reconsider the new 8-hr ozone and fine particulate standards. The court did not throw out the standards, but ruled that U.S. EPA could not enforce them. On February 27, 2001, the Supreme Court substantially reversed the ruling of the lower court. The Supreme Court remanded the case to the Court of Appeals for resolution of any remaining issues that had not been addressed in that court's earlier rulings. In March 2002, the Court of Appeals rejected all remaining challenges to the standards.

In December 2006, EPA issued the final rule revising the NAAQS for PM to provide increased protection of public health and welfare, respectively. EPA revised the level of the 24-hour PM_{2.5} standard to 35 micrograms per cubic meter (µg/m³) and retained the level of the annual PM_{2.5} standard at 15µg/m³. With regard to PM₁₀, the 24-hour standard was retained, but the annual PM₁₀ standard was revoked.

The current 8-hr ozone standard of 0.075 ppm, effective since May 27, 2008 is under reconsideration and will most certainly be revised to a lower value. The final rule is expected this August.

In November 2008 EPA revised the NAAQS for lead from the previous quarterly average of 1.5µg/m³ to the more protective 3-month rolling average of 0.15µg/m³. As part of the lead monitoring requirements, monitoring agencies are required to monitor ambient air near lead

sources which are expected to or have been shown to have a potential to contribute to a 3-month average lead concentration in ambient air in excess of the level of the NAAQS. At a minimum, monitoring agencies must monitor near lead sources that emit 1.0 ton per year (tpy) or more. Monitoring is also required in each Core-Based Statistical Area (CBSA) with a population equal to or greater than 500,000 people as determined by the latest available census figures. Revisions to the monitoring requirements pertaining to where State and local monitoring agencies would be required to conduct lead monitoring were finalized and became effective January 26, 2011. The new regulations replaced the population oriented monitoring requirement with a requirement to add Pb monitors to the urban NCore monitors. The EPA also lowered the emission threshold from 1.0 tpy to 0.50 tpy for industrial sources of lead (e.g., lead smelters and foundries). However, the emission threshold for airports was maintained at 1.0 tpy. In addition, an airport monitoring study will be implemented to determine the need for monitoring of airports which emit less than 1.0 tpy of lead. Under this new rule lead monitoring is required for a minimum of one year at 15 additional airports that have been identified as having characteristics that could lead to ambient lead concentrations approaching or exceeding the lead NAAQS. Brookhaven and Republic airports in Suffolk County, New York have been designated as such, and monitoring will commence this summer.

The annual NAAQS for NO₂ is set at 0.053 ppm. In 2010 EPA revised the NAAQS to include an hourly standard of 0.100 ppm. Under the new NO₂ rule that became effective January 22, 2010 each MSA with population larger than 500,000 will be required to operate a near-road monitor beginning in 2013.

In June, 2010, EPA established a new 1-hour SO₂ standard at a level of 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. Additionally, both the 24-hour and annual primary SO₂ standards were revoked. EPA also established requirements for SO₂ monitoring in areas where there is an increased coincidence of population and SO₂ emissions.

Through the years, ambient monitoring has always been an important and integral part of the overall effort to manage our environmental resources. The Bureau of Air Quality Surveillance, which was originally established in the Division of Air Resources under the Department of Health in 1966, has been performing ambient air monitoring since.

1.2 Topography and Climate of New York State

New York State contains 49,576 square miles, inclusive of 1,637 square miles of inland water, but exclusive of the boundary-water areas of Long Island Sound, New York Harbor, Lake Ontario, and Lake Erie. The Adirondacks cover most of the northeast and occupy about one-fourth of the state's total area. The Appalachian Highlands, including the Catskill Mountains and Kittatinny Mountain Ridge (or Shawangunk Mountains), extend across the southern half of the state, from the Hudson River Valley to the basin of Lake Erie. Between these two upland regions, and also along the state's northern and eastern borders, lies a network of lowlands, including the Great Lakes Plain; the Hudson, Mohawk, Lake Champlain, and St. Lawrence valleys; and the coastal areas of New York City and Long Island.

The climate of New York State is broadly representative of the humid continental type, which prevails in the northeastern United States, but its diversity is not usually encountered within an area of comparable size. The geographical position of the state and the usual course of air masses, governed by the large-scale patterns of atmospheric circulation, provide general climatic controls. Differences in latitude, character of the topography, and proximity to large bodies of water have pronounced effects on the climate.

The planetary atmospheric circulation brings a great variety of air masses to New York State. Masses of cold, dry air frequently arrive from the northern interior of the continent. Prevailing winds from the south and southwest transport warm, humid air, which has been conditioned by the Gulf of Mexico and adjacent subtropical waters. These two air masses provide the dominant continental characteristics of the climate. The third great air mass flows inland from the North Atlantic Ocean and produces cool, cloudy, and damp weather conditions. This maritime influence is important to New York's climatic regime, especially in the southeastern portion of the state, but it is secondary to that of the more prevalent air mass flow from the continent.

The prevailing wind is generally from the west in New York State. A southwest component becomes evident in winds during the warmer months while a northwest component is characteristic of the colder one-half of the year.

The climate of the state features much cloudy weather during the months of November, December, and January in upstate New York, especially those regions that adjoin the Great Lakes and Finger Lakes and include the southern tier of counties. From June through September, however, about 60 to 70 percent of the possible sunshine hours are received. In the Atlantic coastal region, the sunshine hours increases from 50 percent of possible in the winter to about 65 percent of possible in the summer.

The Atlantic Coastal Plain and lower Hudson Valley experience conditions of high temperature and high humidity with some frequency and duration during the summer. By comparison, such conditions occur less frequently in the broad interior of New York State where they are usually shortened by the arrival of cooler, drier air masses from the northwest.

1.3 Population and Demographics

The US Census Bureau data for 2010 provide the following information for the State and 13 Metropolitan Areas of New York. The New York portion of the NY--NJ--CT--PA CMSA population numbered 13,038,826, constituting 69% of the State's total residents.

Table 1.1 2010 Census Population for Major Metropolitan Statistical Areas in New York

MSA	2000	2003	2008	2010	Difference (2000-2010)	%
Albany-Schenectady-Troy	875,583	839,545	853,919	870,716	-4,867	-0.56
Binghamton	252,320	249,622	245,189	251,725	-595	-0.24
Buffalo-Niagara Falls	1,170,111	1,154,569	1,124,309	1,135,509	-34,602	-2.96
Elmira	91,070	89,822	87,813	88,830	-2,240	-2.46
Glens Falls	124,345	125,872	128,775	128,923	4,578	3.68
Ithaca	96,501	99,272	101,136	101,564	5,063	5.25
Kingston	177,749	180,282	181,670	182,493	4,744	2.67
Poughkeepsie-Newburgh-Middletown	621,517	651,878	672,525	670,301	48,784	7.85
Nassau-Suffolk	2,753,913	2,839,842	2,863,849	2,832,882	78,969	2.87
New York-White Plains	9,314,235	9,459,273	9,715,442	9,535,643	221,408	2.38
Rochester	1,098,201	1,040,259	1,034,090	1,054,323	-43,878	-4.00
Syracuse	732,117	649,719	643,794	662,577	-69,540	-9.50
Utica-Rome	299,896	295,953	293,790	299,397	-499	-0.17
State Total	18,976,457	19,231,101	19,467,789	19,378,102	401,645	2.12

According to Census Bureau the NY state population in 2010 totaled 19,378,102, the third most populous state in the nation. The population change from 2000 indicates a net increase of 401,645 for the entire State. The State saw a modest growth overall in the 10-year period, mostly in the downstate areas at the expense of the western MSAs. A population density map by county based on the 2010 data is depicted in Figure 1.1



Figure 1.1 Population Density in New York State by County

Environmental Justice Areas

Environmental justice (EJ) is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

A map of potential EJ areas in the State is shown in Figure 1.2. Approximately 37% of New York's population resides in potential EJ areas. In our network, there are 24 air monitors, 17 of which downstate, sited within areas designated as such. The number of air monitoring sites located in potential EJ areas is commensurate with the population percentage residing therein. In the populous downstate area, 59% of the network monitors are located in potential EJ areas, in which 52% of the population lives.

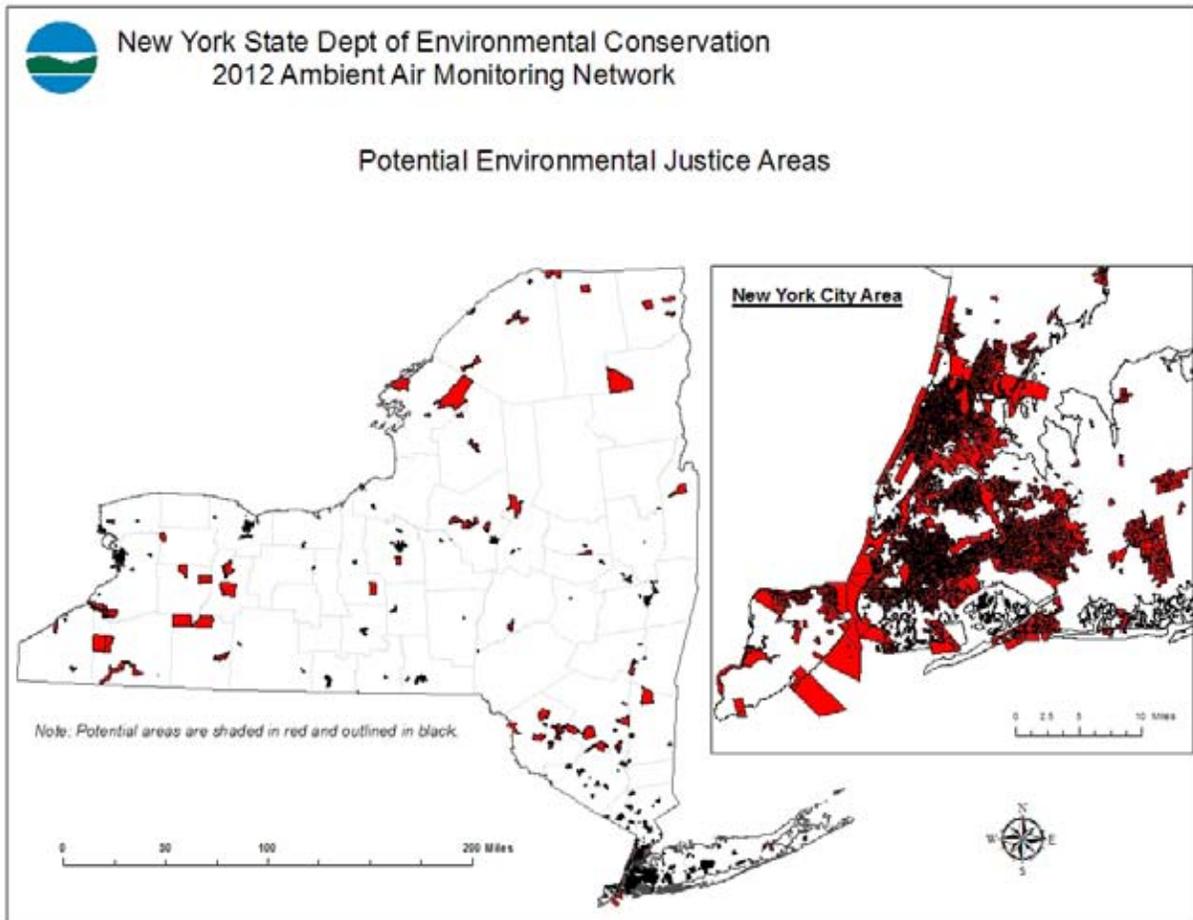


Figure 1.2 Potential Environmental Justice Areas in New York State

Sensitive Sub-Populations

Children, the elderly, and people with underlying health issues may be more susceptible to the deleterious effects associated with air pollution, and are considered to be under the sensitive sub-populations category. Sixteen monitoring sites in the network are located on public school grounds, where attending students are of grade school to high school age.

Citizens groups often bring attention to NYSDEC the areas where they believe have high incidences of health related problems due to air pollution, such as asthma, respiratory diseases, and cancer clusters. Where possible we try to accommodate concerned citizens by providing air quality data from nearby monitoring sites. For example, IS 143 serves the Lower Washington Heights Neighborhood Association; Manhattanville Post Office the North River Community Environmental Review Board; and IS 74 and PS 154 the Nos Quedamos Community Development Corporation. In the case of the Clean Air Coalition of WNY, we were able to obtain EPA funding to carry out the Tonawanda Community Air Quality Study.

2. Chronology of Air Monitoring in New York State

Manual sampling programs began in 1958. Most of the early sampling stations measured suspended particulates, settleable particulates, and sulfation (an indicator of sulfur dioxide concentration). The early monitoring system employed high volume samplers, and for the first year, operated on a daily basis. Subsequently sampling was reduced to a 1-in-6 day schedule, after statistical analysis of the first year's data indicated that such sampling frequency would provide an adequate representation of particulate pollution. By 1964, the manual monitoring system had evolved to 104 full-time stations, 140 stations by 1970, and 250 by the mid 70's.

New York was among the first to install and operate a continuous air quality monitoring system. The parameters monitored in the early 70's included: sulfur dioxide, nitric oxide, nitrogen dioxide, ozone, carbon monoxide, total hydrocarbons, soiling, and meteorological data.

Trace metal analysis of high volume sampler filters was initiated in 1979. Historically the NYS Department of Health provided laboratory services until 2003, when the positions funded by our Department for the analysis work were eliminated due to a statewide workforce reduction. The lead analysis continued until 2005. The lack of formal funding mechanisms between the two state agencies precluded the continuation of laboratory analysis support. The necessary laboratory work is now provided by a contract laboratory.

In 1986, New York began measuring inhalable particulates using high volume air samplers with a 0-10 micron size selective inlet. In the same year the Acid Deposition Monitoring Network was also established. In 1987, EPA revised the PM standard to regulate PM₁₀.

In 1988, the NYS ambient monitoring networks consisted of 85 TSP sites, 16 PM₁₀, 15 carbon monoxide monitors, 27 sulfur dioxide sites, 20 ozone stations, 8 NO_x monitors, and 18 lead sampling sites. There were 17 operational acid deposition sites statewide, and the initial phase of the toxics network was completed with the establishment of six toxic monitors in Staten Island. By 1990, the networks had the following make up: 58 TSP, 60 PM₁₀, 25 SO₂, 16 CO, 26 ozone, 7 NO_x, 16 lead, 18 acid deposition, 10 toxics, and 8 trace metals sites, respectively.

In accordance with the 1990 Clean Air Act Amendments, in 1994 BAQS established the first of two ambient air monitoring sites for enhanced ozone monitoring called Photochemical Assessment Monitoring Stations (PAMS) to collect and report detailed data for volatile organic compounds, nitrogen oxides, ozone and meteorological parameters.

BAQS began implementing the PM_{2.5} monitoring networks of FRM and TEOM monitors in 1998. At its peak, there were 46 FRM instruments deployed. After sufficient data were obtained for attainment determination, FRM sites were reduced and some sites were augmented with TEOM instruments in order to provide realtime inputs for EPA's [AIRNow](#) website for Air Quality Index (AQI) reporting.

BAQS currently operates the following monitors: 33 ozone, 23 SO₂, 6 NO_x (including 3 NO_y), 8 CO, 19 FRM PM_{2.5}, 28 TEOM PM_{2.5}, 5 FRM PM₁₀, 1 TEOM PM₁₀, 7 CSN, 2 speciated carbon, 2 black carbon (aethalometer), 2 speciated mercury, 3 particulate sulfate, 16 acid deposition, 4 TSP-lead, 1 PM₁₀-lead, 2 PM₁₀ metals, 1 methane/non-methane, 11 toxics, 9 carbonyls, 2 PAMS,

2 hexavalent chromium, 2 PAHs, and 23 meteorological stations. Figures 2.1 and 2.2 below show the geographic locations of monitoring sites in all nine regions of the State.

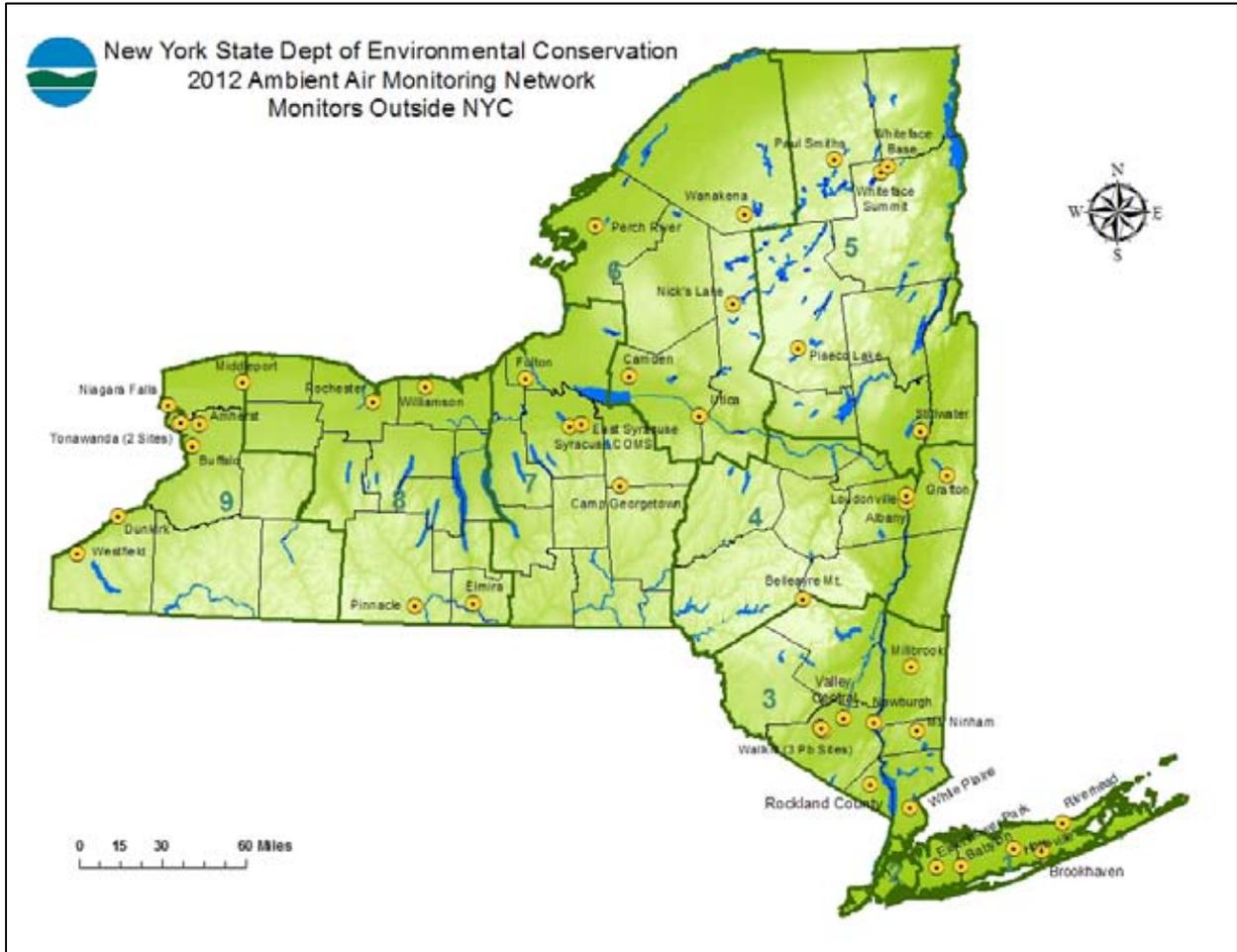


Figure 2.1 Location Map of Monitoring Sites in New York State Excluding NYC

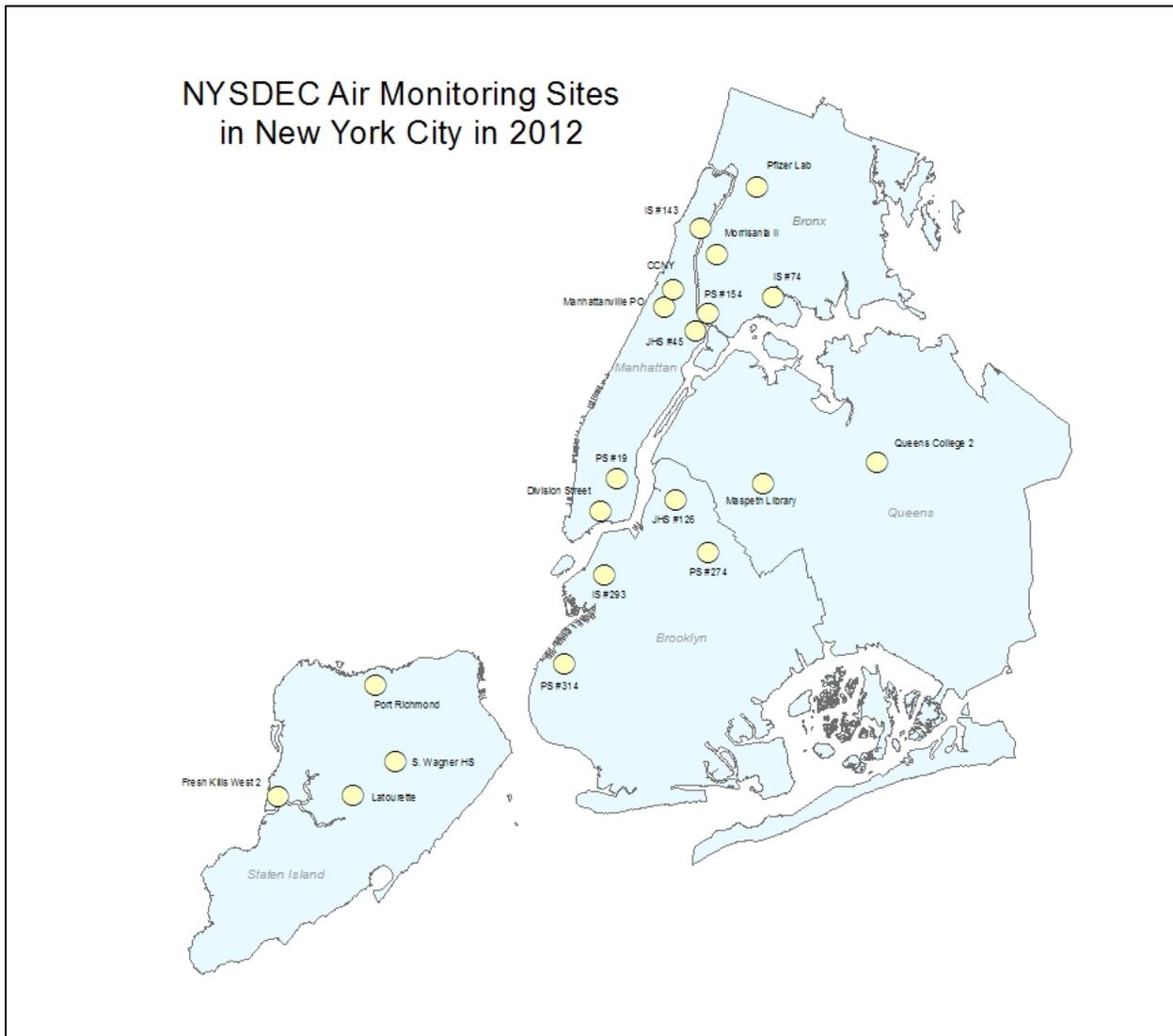


Figure 2.2 Location Map of Ambient Air Monitoring Sites in NYC

2.1 Monitoring Related Research and Investigations

In addition to the routine monitoring work, bureau staff collaborate with researchers from other agencies and academic institutions on a multitude of air pollution related studies. Over the years we have participated in research projects with the following partners: New York State Department of Health, New Jersey Department of Environmental Protection, Connecticut Department of Environmental Protection, State University of New York, Albany, Clarkson University, Massachusetts Institute of Technology, Rutgers University, Drexel University, University of Rochester Medical Center, Desert Research Institute, Rensselaer Polytechnic Institute, City University of New York, and Columbia University. These endeavors provided valuable data for the regulatory, scientific, and health research communities. Study findings are communicated through journal publications, as well as presentations at technical meetings and

conferences. Listings of peer-reviewed scientific articles and oral/poster presentations resulting from recent BAQS monitoring activities are provided below.

2.1.1 Publications

Yungang Wang, Philip K. Hopke, Oliver V. Rattigan, David C. Chalupa, Mark J. Utell. Multi-year black carbon measurement and source apportionment using Delta-C in Rochester, NY. *Journal of the Air & Waste Management Association*, In Press, 2012.

Yungang Wang, Philip K. Hopke, Oliver V. Rattigan, A new Indicator of Firework Emissions in Rochester, New York. *Environmental Monitoring and Assessment*, In Press, 2012.

Yu Chi Lin, James J. Schwab, Kenneth L. Demerjian, Min-Suk Bae, Wei-Nai Chen, Yele Sun, Qi Zhang, Hui-Ming Hung, and Jacqueline Perry, Summertime formaldehyde observations in New York City: Ambient levels, sources and its contribution to HOx radicals. *Journal of Geophysical Research*, Vol. 117, D08305, 14 PP., 2012 doi:10.1029/2011JD016504

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2.1.2 Posters/Presentations

Ultrafine Particle Monitor (TSI 3031) Measurements and Evaluation in New York City, James J. Schwab, G. Garland Lala, Kenneth L. Demerjian, Brian P. Frank, H. D. Felton, Oliver V. Rattigan, Presented at the American Association for Aerosol Research 31st Annual Conference, October 8-12, 2012, Minneapolis, MN.

Spatial Extent of New Particle Formation and Growth Events, James J. Schwab, G. Garland Lala, Kenneth L. Demerjian, Brian P. Frank, H. D. Felton, Oliver V. Rattigan, Presented at the American Association for Aerosol Research 31st Annual Conference, October 8-12, 2012, Minneapolis, MN.

The Age Old Question: Continuous or 24-hr Integrated Measurements, Oliver V. Rattigan, Kevin L. Civerolo, H. D. Felton and James J. Schwab, Presented at the American Association for Aerosol Research 31st Annual Conference, October 8-12, 2012, Minneapolis, MN.

NYSDEC Collaborative Community Air Screening, Dirk Felton, Randi Walker, National Air Monitoring Conference, Denver, CO May, 2012.

Temporal Patterns of Air Pollutants at Urban Locations, Oliver V. Rattigan, 30th Regional Meeting on Kinetics and Dynamics, Wadsworth Center, Albany, Jan 28, 2012.

The following 4 Posters were presented at the EMEP Conference, November 15-16, 2011.

Behavior of ultrafine particles and related particulate and gaseous species at two geographically distributed sites in new york city, B.P. Frank, H.D. Felton, O. Hogrefe, J. Perry, O.V. Rattigan, and R.A. Anderson.

A method to extract and interpret additional aerosol organic carbon fractions from thermal optical analysis of filter-based data, M. Bae, J.J. Schwab, O.V. Rattigan, K.L. Demerjian, M. Choe, and S. Kim.

PM_{2.5} Class III FEMS: performance evaluation at Queens College, New York, O. V. Rattigan, D. H. Felton, and M. Christophersen.

Variations and trends in PM_{2.5} mass, sulfate, and carbon concentrations at a rural and an urban site in new york state , J. J. Schwab, K. L. Demerjian, O. V. Rattigan, and H. D. Felton.

Variations and trends in PM_{2.5} mass, sulfate, and carbon concentrations at a rural and an urban site in New York State, James J. Schwab, Kenneth L. Demerjian, Oliver V. Rattigan, and H. D. Felton, Presented at the American Geophysical Union Annual meeting, San Francisco, November 2011.

A Method to Extract and Interpret Additional Aerosol Organic Carbon Fractions from Thermal Optical Analysis of Filter-Based Data, Min-Suk Bae, James J. Schwab, Oliver V. Rattigan, Kenneth L. Demerjian, American Association for Aerosol Research, 30th annual conference October 3-7, 2011, Orlando, FL.

Characterization of residential wood combustion particles using the two-wavelength aethalometer, Yungang Wang, Philip K. Hopke, Oliver V. Rattigan and Xiaoyan Xia, American Association for Aerosol Research, 30th annual conference October 3-7, 2011, Orlando, FL.

Comparison of Long-Term and Seasonal Behavior of Ultrafine Particles and Related Species Between Urban Near-Road and Area-Wide Monitors in New York City. Brian P Frank, HD Felton, Olga Hogrefe, Jacqueline Perry, ROBERT A ANDERSON. American Association for Aerosol Research, 30th annual conference October 3-7, 2011, Orlando, FL.

Establishing an Ambient Mercury Baseline in New York State: Results from an EPA Community Assessment Grant, National Air Toxics Monitoring and Data Analysis Workshop Dallas, TX, April 4-7, 2011.

The View From Ground Level, a Perspective from the States, Well, at Least the Ambient Air Monitoring Perspective from one State, Dirk Felton, P.E., Health Effects Institute Annual Conference, May 1-3, 2011 Boston, MA.

Comparison of new and old CSN carbon with collocated measurements in New York. Oliver V. Rattigan and H. Dirk Felton, Min-Suk Bae, James J. Schwab and Kenneth L. Demerjian, 29th Annual AAAR Conference, Portland OR, October 25-29, 2010.

Life in the Big City: Evolution of Particle Concentration, Size Distribution, and Composition on a “Typical” Summer Day in Queens, New York City. Schwab et al., (co-authors; ASRC and DEC) 29th Annual AAAR Conference, Portland OR, October 25-29, 2010.

Intercomparison of Long-Term Ambient Ultrafine Particle Size Distribution Measurements at a Near-Roadway and a Representative Urban Site in New York City. Brian P. Frank, Jacqueline Perry, H. D. Felton, Robert A. Anderson, Oliver V. Rattigan. 29th Annual AAAR Conference, Portland OR, October 25-29, 2010.

Urban Mercury Monitoring: Data Review and Operational Notes: A Year Spent with the Tekran Speciated Ambient Mercury Analyzer at Two Urban Locations in New York State and an update of the AMNET program, Dirk Felton, Kevin Civerolo, Matt Hirsh: NYSDEC, MARAMA Monitoring Conference, February 23, 2010.

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Calibration System for Low Range GPT Calibrations of High Sensitivity NO_x and NO_y Monitors, Dirk Felton, Malcolm Baker: NYSDEC Bureau of Air Quality Surveillance
Kirk Lovewell, Mark Cogan: Teledyne API, 2009 EPA National Ambient Air Monitoring Conference.

Aerosol Carbon Measurements Using Different Techniques in New York: Comparison of Total Carbon, Oliver Rattigan, Atmospheric Sciences Research Center Seminar, December 9, 2008.

Aerosol Optical Properties Obtained from Continuous Mass, Composition and Scattering Measurements, James J. Schwab, Min-Suk Bae, Olga Hogrefe, Qi Zhang, G. Garland Lala, Ken Demerjian and Oliver Rattigan, American Association for Aerosol Research Annual Conference, Orlando, FL, October 20-24, 2008.

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Intercomparison and Evaluation of Semi-Continuous PM-2.5 Nitrate and Sulfate Instruments During PMTACS-NY Summer 2001 Campaign in New York City, Olga Hogrefe, Frank Drewnick, James J. Schwab, Henry D. Felton, Kenneth L. Demerjian, AGU 2004.

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NY Discussion of Issues: TEOM Correlations, Quebec Smoke, PM_{2.5} Speciation Data, PMcoarse, Dirk Felton, EPA SAMWG Meeting, 2002.

3. Monitoring Sites

The Bureau's tasks and responsibilities are carried out by staff in four Sections. While the field operators are stationed throughout the State, the managers are physically located in the Central Office in Albany (Northern Monitoring, Network Operations), our Region 2 Office in Long Island City (Southern Monitoring), and the SUNY East Campus in Rensselaer (Monitoring Support). Functionally, the Northern Monitoring Section is responsible for ambient air monitoring sites in upstate New York north of and including the counties of Rockland and Putnam. The Southern Monitoring Section is responsible for ambient air monitoring sites in the counties of Westchester, Nassau, Suffolk, and those counties comprising the City of New York. Currently there are 67 active sites statewide. Figures 3.1 and 3.2 show monitoring site locations for the two monitoring operations, respectively.

 New York State Dept of Environmental Conservation
2012 Ambient Air Monitoring Network

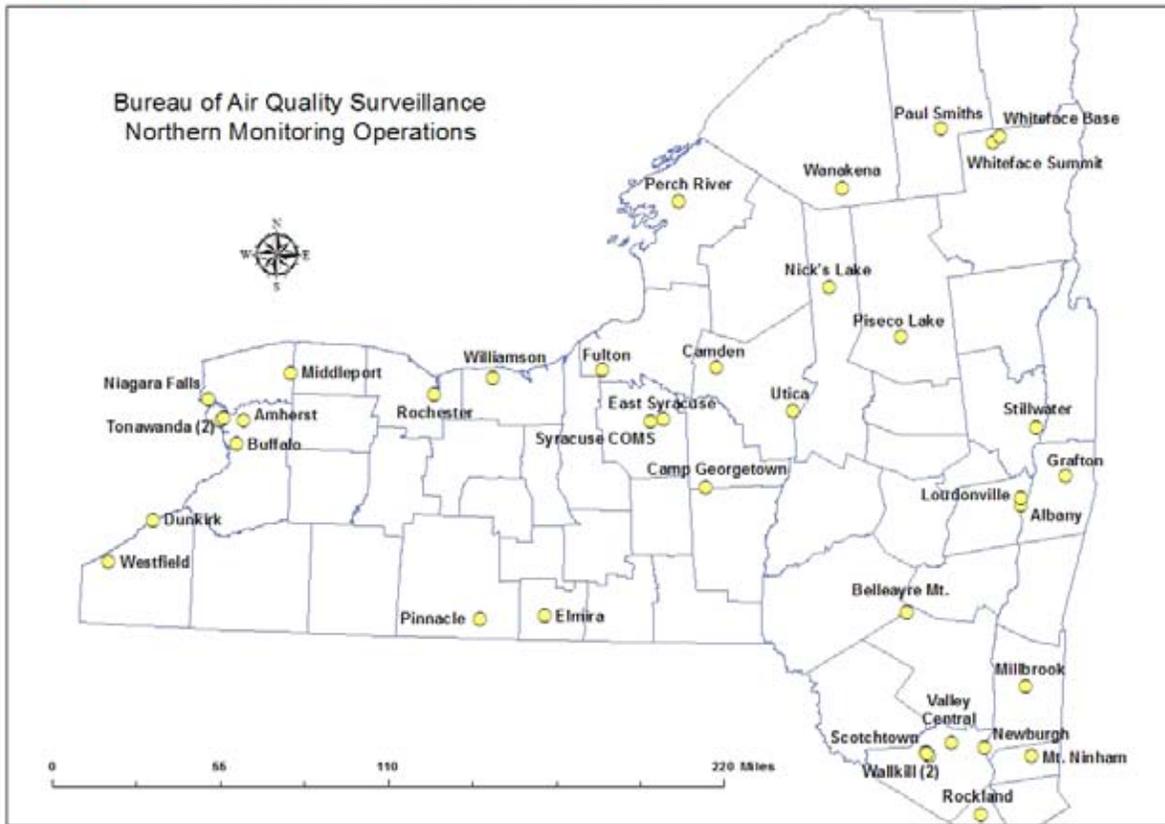


Figure 3.1 Site Locations for Northern Monitoring Operation

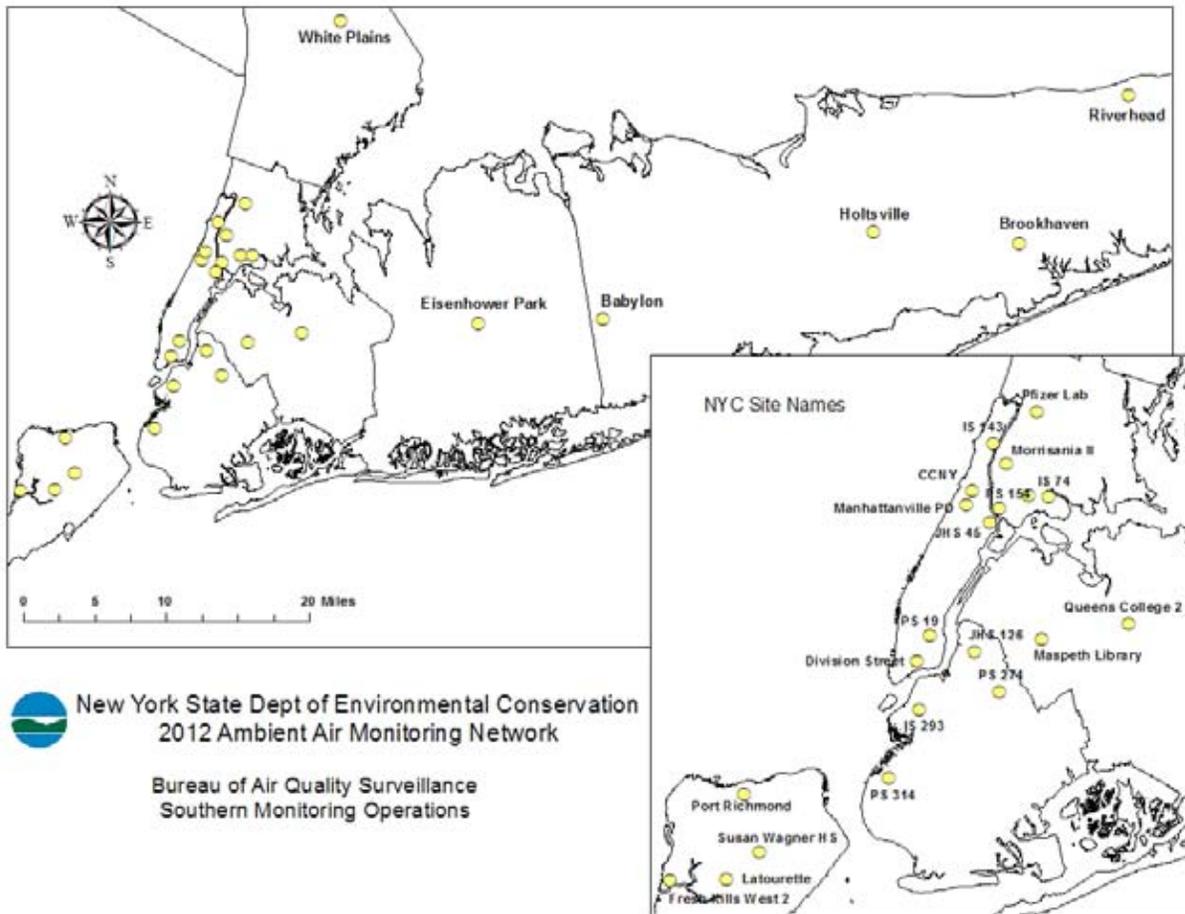


Figure 3.2 Site Locations for Southern Monitoring Operation

Information pertaining to each monitoring site including site photo, location, parameters monitored, sampling frequency, and analysis methodologies is provided below for the two monitoring operations.

Most of the monitoring sites meet the siting criteria requirements for the parameters monitored as specified in Appendix E of 40 CFR Part 50. For the few sites that do not meet all of the siting requirements, we have demonstrated to EPA that in all instances the site is as representative of the monitoring area as it would be if the siting criteria were being met, and that the monitor or probe cannot reasonably be located so as to meet the siting criteria because of physical constraints. Waivers have been granted by the Regional Administrator for these sites.

3.1 Northern Monitoring Site Listings

Table 3.1 Location Listing for Northern Monitoring Sites

DEC Region	AIRS #	DEC #	Site Name	County	Location
3	36-027-0007	1328-01	Millbrook	Dutchess	Forest Research Station
3	36-071-0002	3502-04	Newburgh	Orange	Public Safety Building
3	36-071-5001	3527-01	Valley Central	Orange	Valley Central High School
3	36-071-3001	3566-02	Wallkill Ballard	Orange	Ballard Road
3	36-071-3002	3566-09	Wallkill Wakefurn	Orange	Wakefurn Food
3	36-071-3004	3566-11	Scotchtown	Orange	27 Industrial Drive
3	36-079-0005	3951-01	Mt. Ninham	Putnam	NYSDEC Headquarters
3	36-111-1005	5565-03	Belleayre Mt.	Ulster	Cross country ski area
3	36-087-0005	4353-02	Rockland County	Rockland	Conklin Orchard
4	36-001-0005	0101-13	Albany	Albany	Albany County Health Department
4	36-001-0012	0101-33	Loudonville	Albany	Reservoir
4	36-083-0004	4153-04	Grafton	Rensselaer	Grafton State Park
5	36-031-0002	1567-03	Whiteface Summit	Essex	Summit Building
5	36-031-0003	1567-04	Whiteface Lodge	Essex	ASRC (Base Lodge)
5	36-041-0005	2050-01	Piseco Lake	Hamilton	Airport
5	36-091-0004	4567-01	Stillwater	Saratoga	Saratoga Historical Park
6	36-033-0004	1655-01	Paul Smiths	Franklin	Paul Smith College
6	36-043-0005	2167-03	Nick's Lake	Herkimer	Campground
6	36-045-0002	2223-01	Perch River	Jefferson	Game Management Building
6	36-065-2001	3202-01	Utica	Oneida	Utica Health Dept
6	36-065-0004	3255-01	Camden	Oneida	Rt 13, farm field
6	36-089-0005	4458-05	Wanakena	St. Lawrence	Ranger Station
7	36-053-0006	2655-01	Camp George Town	Madison	Rural site
7	36-067-0017	3301-22	Syracuse	Onondaga	Syr COMS
7	36-067-1015	3353-09	E. Syracuse	Onondaga	Enterprise Parkway
7	36-075-0003	3754-01	Fulton	Oswego	820 County Rt. 8
8	36-015-0003	0701-05	Elmira	Chemung	Water Treatment Plant
8	36-055-1007	2701-22	Rochester	Monroe	Yarmouth Rd (RG&E Substation)
8	36-101-0003	5001-04	Pinnacle	Steuben	Pinnacle State Park
8	36-117-3001	5863-01	Williamson	Wayne	Wayne County Occupational Center
9	36-029-0002	1451-03	Amherst	Erie	450 Maple Rd, Amherst Parks Dept
9	36-029-1014	1472-14	Tonawanda II	Erie	192 Brookside Terrace West
9	36-063-2008	3102-25	Niagara Falls	Niagara	Frontier Avenue & 55th Street
9	36-063-1006	3120-02	Middleport	Niagara	Sewage Treatment Plant
9	36-013-0006	0601-04	Dunkirk	Chautauqua	Sewage Treatment Plant
9	36-013-0011	0675-01	Westfield	Chautauqua	Northrup Farm, Hardscrabble Road
9	36-029-0005	1401-18	Buffalo	Erie	Off Dingens Street, near Weiss

Site operation terminated as of 12/31/2011

4	36-093-0003	4601-05	Schenectady	Schenectady	Mt. Pleasant High School
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Albany County Health Dept. 36-001-0005



**South Ferry and Green Streets
Albany, NY 12202**

Albany County Health Department

Address: South Ferry and Green Streets
Albany, NY 12202

AQS Number: 36-001-0005

DEC Number: 0101-13

County: Albany

Statistical Area: Albany-Schenectady-Troy

Coordinates: Lat: 42.64225 Lon: -73.75464

This site was established in 1973 as a TSP site. Over time, it has progressed to PM₁₀ and is now a collocated PM_{2.5} FRM site. A continuous R&P TEOM is also operated at the Albany County Health Department. This site is used for AIRNow reporting. Speciation sampling was added in January 2008.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3
PM _{2.5} Collocated	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
PM _{2.5} Speciation	Met One SASS Method 811	XRF	1 in 3

Amherst

36-029-0002



450 Maple Road
Amherst, NY 14221

Amherst

Address: Town of Amherst Parks Department & Audubon Golf Course
450 Maple Road
Amherst, NY 14221

AQS Number: 36-029-0002
DEC Number: 1451-03
County: Erie
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 42.99328 Lon: -78.77153

This site was established in July 1972. Amherst is a permanent ozone and nitrogen dioxide site. It is located on land behind the Town of Amherst Parks Department Maintenance building and alongside the Audubon Golf Course in a suburban area. This site measures ozone for the Buffalo area and transport from points west. It is reported on the AIRNow system.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Oxides of Nitrogen (NO, NO ₂ , NO _x)	TEI 42C Method 074	Chemiluminescence	Continuous
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

Proposed changes: discontinue NO_x, relocate FRM PM_{2.5} and acid deposition sampling here from Niagara Falls.

Belleayre 36-111-1005

**Belleayre Mountain
Belleayre Cross Country Ski Area Parking Lot
Ulster & Delaware Turnpike**



Highmount, NY 12441

Belleayre

Address: Belleayre Cross Ski Area Parking Lot
Ulster & Delaware Turnpike
Highmount, NY 12441

AQS Number: 36-111-1005

DEC Number: 5565-03

County: Ulster

Statistical Area:

Coordinates: Lat: 42.14403 Lon: -74.49431

This site was established in 1987 as part of the NYSDEC Acid Deposition program. It is located on NYSDEC land at the Belleayre Mountain Ski Center cross country access area. The surrounding area is primarily forest and rural. The O₃ and SO₂ are both operated continuously without seasonal interruption. The O₃ data are for regional transport and background values. The SO₂ data are used in conjunction with the acid deposition data. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Wind Speed/Direction	Climatronics Sonic Method 020		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Proposed changes: close site.

Buffalo

36-029-0005



**185 Dingens Street
Buffalo, NY 14206**

Buffalo

Address: New York State Thruway Authority Bridge Maintenance Facility Access Road
Buffalo, NY 14206

AQS Number: 36-029-0005
DEC Number: 1401-18
County: Erie
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 42.87691 Lon: -78.80981

This site was originally established in January 1969 and is considered an urban scale site. Buffalo is the main monitoring site for the Buffalo area. It is located on the access road to the New York State Thruway Authority Bridge Maintenance Facility in an urbanized area. It is in close proximity to interstate 190 and was downwind of significant industrial sources in the 1970s. The impact from industrial sources had been drastically reduced over the past two decades. The continuous PM_{2.5} data is reported to the AIRNow system.

Acid Deposition monitoring was terminated at this site December 31, 2010, measurements available nearby at the Niagara Falls monitoring station.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Oxides of Nitrogen (NO, NO ₂ , NO _x)	TEI 42C Method 074	Chemiluminescence	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3 Day
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
PM _{2.5} Speciation	Met One SASS Method 811	XRF	Every Sixth Day
Carbon	URG 3000 Method 838	IMPROVE TOR	Every Sixth Day
Wind Speed/direction	Climatronics Sonic Method 020		Continuous

Parameter	Sampling Method	Analysis Method	Schedule
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

Proposed changes: relocate toxics sampling here from Niagara Falls.

Camden

36-065-0004

State Route 13



Camden, NY 13316

Camden

Address: State Route 13
Camden, NY 13316

AQS Number: 36-065-0004

DEC Number: 3255-01

County: Oneida

Statistical Area: Utica- Rome, NY

Coordinates: Lat: 43.30268 Lon: -75.71978

This site was established in 1980 as a Syracuse downwind site. Camden is a seasonal automated ozone site, requiring minimal operator attention. It is located on land adjacent to the Camden Highway Department which allows BAQS easy and secure access. Camden is used for AIRNow reporting.

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

Proposed changes: close site.

Camp Georgetown

36-053-0006



Camp Georgetown
Crumb Hill Road
Georgetown, NY 13072

Camp Georgetown

Address: Crumb Hill Road
Georgetown, NY 13072

AQS Number: 36-053-0006
DEC Number: 2655-01
County: Madison
Statistical Area: Syracuse, NY
Coordinates: Lat: 42.73046 Lon: -75.78444

This site was established in 1987 as part of the NYSDEC Acid Deposition program in the Syracuse area of Central New York. The surrounding area is primarily forest and rural. The O₃ and SO₂ are both operated continuously without seasonal interruption. SO₂ data are used by analysts in conjunction with the data from the acid deposition program. Ozone readings are reported to AIRNow. Currently the site is not in operation as power was shut off when the state facility was closed in April, 2012.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Proposed changes: relocate to a yet to be determined site.

Dunkirk

36-013-0006



City of Dunkirk Sewage Treatment Plant
Wright Park Drive
Dunkirk, NY 14048

Dunkirk

Address: City of Dunkirk Sewage Treatment Plant
Wright Park Drive
Dunkirk, NY 14048

AQS Number: 36-013-0006
DEC Number: 0601-04
County: Chautauqua
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 42.49963 Lon: -79.31881

The Dunkirk monitoring trailer was established in 1999 as a regional transport site. It is located at the western edge of New York on the shores of Lake Erie at the City of Dunkirk’s Sewage Treatment Plant. It is approximately 200 feet from Lake Erie in a suburban neighborhood. With the predominant wind direction from the west, this site measures the background levels of pollution entering the state. Ozone levels are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

East Syracuse 36-067-1015



**East Syracuse
5895 Enterprise Parkway
Syracuse, NY 13202**

East Syracuse

Address: 5895 Enterprise Parkway
Syracuse, NY 13202

AQS Number: 36-067-1015
DEC Number: 3353-09
County: Onondaga
Statistical Area: Syracuse
Coordinates: Lat: 43.05235 Lon: -76.05921

This site was established in 1991 in commercial area of suburban Syracuse. It is the primary air monitoring site in the Syracuse metropolitan area. In 1999 the site became part of the original PM_{2.5} FRM monitoring network. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3 days, 24- hour
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Teledyne RH200 Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	

Elmira

36-015-0003



Elmira Water Treatment
Sullivan Street
Elmira, NY 14901

Elmira

Address: Water Treatment Plant
Sullivant St.
Elmira, NY 14901

AQS Number: 36-015-0003
DEC Number: 0701-05
County: Chemung
Statistical Area: Elmira
Coordinates: Lat: 42.11096 Lon: -76.80221

This site was established in 1973 in a urban Elmira. It is primarily in a commercial, population exposure area. The site was expanded in 1987 as part of the NYS Acid Deposition network It is the only monitoring site on the southern tier of New York. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Teledyne RH200 Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	

Proposed changes: close site, relocate acid deposition to Pinnacle.

Fulton

36-075-0003



**820 County Route 8
Fulton, NY 13069**

Fulton

Address: Granby Community Center
820 County Route 8
Fulton, NY 13069

AQS Number: 36-075-0003
DEC Number: 3754-01
County: Oswego
Statistical Area: Syracuse, NY
Coordinates: Lat: 43.28428 Lon: -76.46324

The Fulton site was initiated on October 3, 2002 to measure the Ozone downwind of the Rochester area. Fulton is a seasonal automated ozone site, requiring minimal operator attention. The location in the Granby Community Center offers easy and secure access for DEC staff to perform site maintenance.

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

Grafton Lakes State Park

36-083-0004



Grafton Lakes State Park
194 Shaver Pond Road
Grafton, NY 12082

Grafton Lakes State Park

Address: 194 Shaver Pond Road
Grafton, NY

AQS Number: 36-083-0004
DEC Number: 4153-04
County: Rensselaer
Statistical Area: Albany-Schenectady-Troy, NY
Coordinates: Lat: 42.78189 Lon: -73.46363

This site was established in 2001 at the Grafton Lakes State Park as a replacement for the site located at the Dyken Pond Environmental Education Center of Rensselaer County. This is primarily a downwind site for the Albany area. The Grafton ozone is the only monitor between Albany and the Massachusetts state line. It is the only collocated Acid Deposition site operated by NYSDEC.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Precipitation (collocated)	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Proposed changes: close site, relocate acid deposition to Loudonville.

Loudonville 36-001-0012



**300 Albany Shaker Road
Albany, NY 12211**

Loudonville

Address: 300 Albany Shaker Road
Albany, NY 12211

AQS Number: 36-001-0012
DEC Number: 0101-33
County: Albany
Statistical Area: Albany-Schenectady-Troy
Coordinates: Lat: 42.68075 Lon: -73.75733

This site was established in 1986 as a neighborhood scale, population exposure site. The site was expanded as part of the NYSDEC Acid Deposition Network. It is located in suburban Albany, in close proximity to Interstate 90. Ozone readings are reported to AIRNow and it is the only ozone monitor in Albany County. PM_{2.5} sampling was added in January 2008. Acid Deposition monitoring was terminated at this site December 31, 2010, measurements available at the Grafton site nearby.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3
Wind Speed/Direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Met One 083D Method 011		Continuous
Ambient Temperature	Met One Method 040		Continuous
Barometric Pressure	Novalynx 230-276-8 Method 011		Continuous

Proposed changes: relocate acid deposition here from Grafton.

Middleport 36-063-1006



**3825 North Hartland Road
Middleport, NY 14105**

Middleport

Address: Middleport Sewage Treatment Plant
3825 North Hartland Road
Middleport, NY 14105

AQS Number: 36-063-1006
DEC Number: 3120-02
County: Niagara
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 43.22386 Lon: -78.47888

This site was established in 1980 as a Buffalo downwind site. Middleport is a seasonal ozone site, operating between April and November. It is located on land adjacent to the Middleport Sewage Treatment Plant in a rural and largely agricultural area. Ozone is measured for regional transport from Buffalo and points west.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

Millbrook

36-027-0007



Millbrook
Institute of Ecosystem Studies
Millbrook, NY 12545

Millbrook

Address: Institute of Ecosystem Studies
Forest Road
Millbrook, NY 12545

AQS Number: 36-027-0007
DEC Number: 1328-01
County: Dutchess
Statistical Area: Dutchess County, NY
Coordinates: Lat: 41.78555 Lon: -73.74136

This site was established in 1990 as a replacement for the site in the city of Poughkeepsie. The site was suggested by researchers at the Institute of Ecosystem Studies when they suspected that the ozone values in the rural and agricultural area might be higher than those of the high traffic city monitor. The site is shared by the scientists at IES, and researchers there value the data. Ozone readings are reported to AIRNow. Sulfur dioxide measurements were added in June, 2011.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Wind Speed/Direction	Climatronics Sonic Method 020		Continuous
Relative Humidity	Met One 083D Method 011		Continuous
Ambient Temperature	Met One Method 040		Continuous
Barometric Pressure	Novalynx 230-276-8 Method 011		Continuous
Precipitation	Belfort Rain Gauge		Continuous

Newburgh

36-071-0002



Public Safety Building
55 Broadway
Newburgh, NY 12550

Newburgh

Address: Public Safety Building
55 Broadway
Newburgh, NY 12550

AQS Number: 36-071-0002
DEC Number: 3502-04
County: Orange
Statistical Area: New York, NY
Coordinates: Lat: 41.49916 Lon: -74.00885

Newburgh was established in 2000 as part of the NYS PM_{2.5} FRM network. It currently has both a 1 in 3 day FRM and continuous R&P 1400 TEOM. This site has been used to calculate the “FRM Like” values that are reported to the AIRNow system for the TEOMs in New York City, Albany, Newburgh and Utica.

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 3
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

Niagara Falls 36-063-2008



**Frontier Avenue at 55th Street
Niagara Falls, NY 14304**

Niagara Falls

Address: Frontier Avenue and 55th Street
Niagara Falls, NY 14304

AQS Number: 36-063-2008

DEC Number: 3102-25

County: Niagara

Statistical Area: Buffalo - Niagara Falls, NY

Coordinates: Lat: 43.08218 Lon: -79.00106

The Niagara Falls monitoring trailer was relocated to this location in 1998 as a neighborhood scale, population exposure site. It is located on the corner of Frontier Avenue and 55th Street directly downwind of a large industrial area and upwind of a large residential neighborhood. PM_{2.5} data is reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	Every Third Day
PM ₁₀	R&P Partisol 2025 Method 127	Gravimetric	Every Third Day
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
Toxics	Canister Method 150	GC/MS	Every Sixth Day
Carbonyls	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	Every Sixth Day
Acid Deposition	Hyteometer	DEC Laboratory	Collection Weekly
Wind Speed/direction	Climatronics Sonic Method 020		Continuous

Parameter	Sampling Method	Analysis Method	Schedule
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

Proposed changes: close site, relocate toxics to Buffalo, acid deposition and FRM PM_{2.5} to Amherst.

Nick's Lake

36-043-0005



Nick's Lake Campground
278 Bisby Road
Old Forge, NY

Nick’s Lake Campground

Address: 278 Bisby Road
Old Forge, NY

AQS Number: 36-043-0005
DEC Number: 2167-03
County: Herkimer
Statistical Area: Utica-Rome, NY
Coordinates: Lat: 43.68578 Lon: -74.98538

This site was established in 1987 at the Nick’s Lake Campground as part of the Acid Deposition program in the Adirondack Park. The O₃ and SO₂ are both operated continuously without seasonal interruption. SO₂ data are used by analysts in conjunction with the data from the acid deposition program. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Proposed changes: close site.

Mt. Ninham

36-079-0005



Mt. Ninham
NYSDEC Multiple Use Area
Gypsy Trail Road
Kent, NY 10512

Mt Ninham

Address: NYSDEC Multiple Use Area
Gypsy Trail Road
Kent, NY 10512

AQS Number: 36-079-0005
DEC Number: 3951-01
County: Putnam
Statistical Area: New York, NY
Coordinates: Lat: 41.45589 Lon: -73.70977

This site was established in 1987 as part of the NYSDEC Acid Deposition program in the lower Hudson Valley. The surrounding area is primarily forest and rural. The O₃ and SO₂ are both operated continuously without seasonal interruption. The O₃ data show transport from the metropolitan area of NY and NJ. SO₂ data are used by analysts in conjunction with the data from the acid deposition program. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Proposed changes: discontinue acid deposition.

Paul Smith's College 36-033-0004



**Route 86 and 30
Paul Smith's, NY 12970**

Paul Smith's College

Address: Route 86 and 30
Paul Smith's, NY 12970

AQS Number: 36-033-0004
DEC Number: 1655-01
County: Franklin
Coordinates: Lat: 44.43426 Lon: -74.24593

This site was established in 2003 in partnership with Paul Smith's College. The site is used as a teaching center by the school. It is maintained and operated by employees of the college with QA and technical support provided by DEC.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Perch River 36-045-0002



**Vaadi Road
LaFargeville, NY 13656**

Perch River

Address: Perch River Game Management Area
Vaadi Road
LaFargeville, NY 13656

AQS Number: 36-045-0002
DEC Number: 2223-01
County: Jefferson
Statistical Area:
Coordinates: Lat: 44.08747 Lon: -75.97316

This site was established in 1992 as an Eastern Lake Ontario Ozone site. Perch River is a seasonal automated ozone site, requiring minimal operator attention. It is located in the Game Management Building at a DEC owned site, which allows BAQS easy and secure access. Perch River is used for AIRNow reporting.

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Barometric Pressure	Teledyne BP300 Method 011		

Pinnacle

36-101-0003



Pinnacle State Park
1904 Pinnacle Road
Addison, NY 14801

Pinnacle

Address: Pinnacle State Park
1904 Pinnacle Road
Addison, NY 14801

AQS Number: 36-101-0003
DEC Number: 5001-04
County: Steuben
Statistical Area:
Coordinates: Lat: 42.09142 Lon: -77.20978

This site was originally established in the mid 1990s by the Atmospheric Sciences Research Center to provide PAMs data upwind of the Northeast corridor. The NYSDEC has been collaborating on research initiatives at this site and now is responsible for many routine parameters reported from this site. The site was part of the NY PMTACS Supersite program and many research monitoring projects are on-going at this site. This site has been selected by EPA and DEC as a rural NCore site. Ozone, Low Level SO₂, NO_y and continuous PM_{2.5} and PM₁₀ from this site are reported to AIRNow.

Proposed changes:
Reduce sampling frequency from daily to 1 in 3 days for FRM PM_{2.5}.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Low Level SO ₂	TEI 43i TLE Method 560	Pulsed Fluorescence	Continuous
Low Level CO	API 300EU Method 593	Non Dispersive Infrared	Continuous
NO _y	API 200EU Method 082	Chemiluminescence	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 day in 3
PM _{2.5} , PMcourse, PM ₁₀	TEI 1405 DF Method 790	TEOM 30°C Gravimetric	Continuous
PM _{2.5} Speciation	Met One SASS Method 811	XRF	1 day in 3

Parameter	Sampling Method	Analysis Method	Schedule
Wind Speed/direction	Method 020	---	Continuous
Temperature	Method 040	---	Continuous
Barometric Pressure	Method 011	---	Continuous
Relative Humidity	Method 011	---	Continuous

Proposed changes: relocate acid deposition here from Elmira.

Piseco Lake

36-041-0005



Piseco Lake
Piseco Airport
Piseco Lake, NY 12139

Piseco Lake

Address: Piseco Airport
Piseco Lake, NY 12139

AQS Number: 36-041-0005
DEC Number: 2050-01
County: Hamilton
Statistical Area:
Coordinates: Lat: 43.44957 Lon: -74.51625

This site was established in 1988 at the Piseco Airport as part of the Acid Deposition program in the southern Adirondacks. The O₃ and SO₂ are both operated continuously without seasonal interruption. SO₂ data are used by analysts in conjunction with the data from the acid deposition program. Ozone readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	As collected

Rochester

36-055-1007



Rochester
RG&E Substation
Yarmouth Road
Rochester, NY 14610

Rochester

Address: RG&E Substation
30 Yarmouth Road
Rochester, NY 14610

AQS Number: 36-055-1007
DEC Number: 2701-22
County: Monroe
Statistical Area: Rochester
Coordinates: Lat: 43.14618 Lon: -72.54817

This site was established in 2004 to consolidate monitoring operations in the Rochester area. This is the major site in upstate New York and has been selected as a PM_{2.5} Speciation Trends site, a NATTs site and an NCORE site. The Ozone and continuous PM_{2.5} readings from this site are reported to AIRNow. The site is also used by researchers from several universities for short term monitoring studies. Current research monitoring includes Mercury speciation and ultra-fine particle counting. Data from this site is often integrated in the work from the PM Health Center which is located at the University of Rochester Medical Center. The Rochester PM Center is one of 5 in the country.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 in 6
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
PM ₁₀	R&P Partisol 2025 Method 127	Gravimetric	1 in 6
PM ₁₀ - Metals	Method 907	ICPMS	1 in 6
PM _{2.5} Speciation	Met One Super SASS Method 851	RTI Laboratory	1 in 3

Parameter	Sampling Method	Analysis Method	Schedule
Black Carbon	Magee Scientific Aethalometer Method 866	Optical Absorption	Continuous
Mercury Elemental/Reactive Gas	Tekran Mercury Vapor Analyzer	Cold Vapor Atomic Fluorescence Spectrometry	Continuous
Toxics	Canister Method 150	GC/MS	1 in 6
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 in 6
Chromium	Method 921	EPA/ERG	1 in 6
Polycyclic Aromatic Hydrocarbons (PAH)	EPA Method 118		1 in 6
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	Weekly

Rockland County
36-087-0005



Conklin Orchard
South Mountain Rd.
Pomona, NY 10970

Rockland County

Address: Conklin Orchard
South Mountain Road
Pomona, NY 10970

AQS Number: 36-087-0005
DEC Number: 4353-02
New York State County: Rockland
Statistical Area: New York City Metropolitan Area
Coordinates: 41.18208 N -74.02819 W

The Rockland County site was originally established as a demonstration study requested by the Rockland County Department of Health. This is the third and permanent location for the Rockland County monitor. Data are reported to AIRNow for ozone and PM_{2.5}.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
PM _{2.5}	R&P TEOM 1400 Method 701 Method 702	TEOM Gravimetric 50°C	Continuous

Stillwater

36-091-0004



**Saratoga National Historical Park
Stillwater, NY 12170**

Stillwater

Address: Saratoga National Historical Park
Stillwater, NY 12170

AQS Number: 36-091-0004
DEC Number: 4567-01
County: Saratoga
MSA: Albany-Schenectady-Troy, NY
Coordinates: Lat: 43.01209 Lon: -74.64890

This site was established in 1988 in rural eastern Saratoga County north of Albany, NY. It is located in a room adjacent to the library at the Saratoga National Historical Park. The site offers insight into transport up the main travel corridor in the region and along the Hudson River valley. The data gathered at this site is reported to AIRNow.

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

Syracuse COMS 36-067-0017



**Syracuse COMS
East Adams St. and Route 81
Syracuse, NY 13202**

Syracuse COMS

Address: East Adams St. and Route 81
Syracuse, NY 13202

AQS Number: 36-067-0017
DEC Number: 3301-22
County: Onondaga
Statistical Area: Syracuse, NY
Coordinates: Lat: 43.04257 Lon: -76.14330

This site was established in 1983 in response to elevated CO readings in the Syracuse metropolitan region. The area was in non-attainment for CO at the time. The surrounding area is urban residential and has high vehicle traffic. This maintenance site is scheduled to terminate operation at the end of 2012.

Parameter	Sampling Method	Analysis Method	Schedule
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous

Proposed changes: close site.

Tonawanda II 36-029-1014



**192 Brookside Terrace West
Tonawanda, NY 14150**

Tonawanda II

Address: 192 Brookside Terrace West
Tonawanda, NY 14150

AQS Number: 36-029-1014
DEC Number: 1472-14
County: Erie
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 42.99813 Lon: -78.89926

The Tonawanda monitoring site was originally established in 1968 on the grounds of the Town of Tonawanda Sewage Treatment Plant as a source impact site for Sulfur Dioxide. In 2007 the sulfur dioxide monitor was moved to this current location as part of the Tonawanda Community Air Quality Study. This site borders a residential neighborhood and the industrial complex, and is approximately 0.2 mile northeast of the original historic site.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
Toxics	Canister Method 150	GC/MS	1 in 6
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 in 6

Utica

36-065-2001



**406 Elizabeth Street
Utica, NY 13501**

Utica

Address: Utica Health Department
406 Elizabeth Street
Utica, NY 13501

AQS Number: 36-065-2001
DEC Number: 3202-01
County: Oneida
Statistical Area: Utica- Rome, NY
Coordinates: Lat: 43.09892 Lon: -75.22506

The Utica Health Department site was established in 1957 as a TSP site. The site monitored PM₁₀ between 1991 and 1998. In 2003, a continuous PM_{2.5} was installed at the Utica site. The data collected is a part of the AIRNow report and is one of only eight continuous PM sites in upstate New York.

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

Valley Central High School 36-071-5001



1175 route 17K
Montgomery, NY 10940

Valley Central H.S.

Address: 1175 Route 17 K
Montgomery, NY 10940

AQS Number: 36-071-5001

DEC Number: 3527-01

County: Orange

MSA: Newburgh, NY-PA

CMSA: New York-N New Jersey-Long Island, NY,NJ,CT,PA

Coordinates: Lat: 41.52375 Lon: -74.21534

This site was established in 1995 in suburban Newburgh in Montgomery, Orange County. It is a single parameter Ozone monitoring site. It is the only ozone monitor in Orange County and the data is reported to AIRNow. The public has shown great interest in the data generated in this area of the state.

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

Wallkill Lead Monitoring

Wallkill Ballard Road
36-071-3001



Wallkill Wakefurn Food
36-071-3002



Scotchtown
36-071-3004

These sites are the only routine lead monitoring sites in upstate New York. They are located in the vicinity of RSR Corporation and were established as high priority SLAMS lead monitors. They are source oriented monitoring sites. The two sites on Ballard Road are upwind and the Scotchtown site is downwind of RSR. In August 2011 an additional low volume PM₁₀ sampler was put in place for daily mass and lead analysis at the Wakefern site when measurements from the prior winter showed unusually high values for a couple of sample dates.

Ball Corp.

Address: 95 Ballard Rd.
Middletown NY 10941

AQS Number: 36-071-3001
DEC Number: 3566-02
County: Orange
Statistical Area: Newburgh, NY-PA
Coordinates: Lon: 41.46107 Lat: -74.36343

Wakefern Food Corp.

Address: 260 Ballard Rd.
Middletown, New York 10941

AQS Number: 36-071-3002
DEC Number: 3566-09
County: Orange
Statistical Area: Newburgh, NY-PA
Coordinates: Lon: 41.45869 Lat: -74.35404

Scotchtown

Address: 27 Industrial Drive
Middletown, NY 10941

AQS Number: 36-071-3004
DEC Number: 3566-11
County: Orange
Statistical Area: Newburgh, NY-PA
Coordinates: Lon: 41.46964 Lat: -74.37217

Parameter	Sampling Method	Analysis Method	Schedule
Lead	Hi-Vol TSP Method 803	Atomic Absorption	1 day in 6
	Low-Vol PM ₁₀ Method 811	XRF	Daily
PM ₁₀	Method 127	Gravimetric	Daily

Wanakena 36-089-0005



**New York State Ranger School
257 Ranger School Road
Wanakena, NY 13695**

Wanakena

Address: Ranger Station
New York State Ranger School
257 Ranger School Road
Wanakena, NY 13695

AQS Number: 36-089-0005
DEC Number: 4458-05
County: St. Lawrence
Statistical Area:
Coordinates: Lat: 44.14998 Lon: -74.89980

This site is a stand-alone Acid Deposition Monitor in the Adirondack region.

Parameter	Sampling Method	Analysis Method	Schedule
Acid Deposition	Hyteometer	DEC Lab	As collected

Westfield 36-013-0011



**8150 Hardscrabble Road
Westfield, NY 14787**

Westfield

Address: 8150 Hardscrabble Road
Westfield, NY 14787

AQS Number: 36-013-0011
DEC Number: 0675-01
County: Chautauqua
Statistical Area: Buffalo - Niagara Falls, NY
Coordinates: Lat: 42.29071 Lon: -79.58961

The Westfield monitoring trailer was established in 1986 as a regional transport and Acid Deposition monitoring site. It is located at the southwestern edge of New York on a road side portion of a farmer’s field on Hardscrabble Road. It is approximately 2½ miles from Lake Erie in an elevated agricultural area. With the predominant wind direction from the west, this site measures the background levels of pollution entering the state. It is reported to the AIRNow system.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	Every Third Day
Acid Deposition	Hyteometer	DEC Laboratory	Collection Weekly
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous

Proposed changes: close site.

Whiteface Lodge

36-031-0003



Whiteface Lodge
University at Albany
ASRC Field Station
Wilmington, NY 12997

Whiteface Lodge

Address: University at Albany
Atmospheric Science Research Center Field Station
Wilmington, NY 12997

AQS Number: 36-031-0003
DEC Number: 1567-04
County: Essex
Statistical Area:
Coordinates: Lat: 44.39308 Lon: -73.85890

This site was established in 1974 at the Atmospheric Science Research Center field station at Whiteface Mountain. This site is run in cooperation with the ASRC at UAlbany. The site was used as the site of the 2002 summer intensive PM_{2.5} field study to provide detailed real time chemical and physical data for PM and its co-pollutants. Ozone and continuous PM_{2.5} readings are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 day in 6
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
PM _{2.5} Speciation	Met One Super SASS	RTI Laboratory	1 day in 6
Carbon	URG 3000 Method 838	IMPROVE TOR	1 day in 6
Toxics	Canister Method 150	GC/MS	1 day in 6
Carbonyl	DNPB Cartridge Method 202	HPLC - Ultraviolet Absorption	1 day in 6

Parameter	Sampling Method	Analysis Method	Schedule
Wind Speed/direction	Climatronics Sonic Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Teledyne RH200 Method 011		Continuous
Temperature	Teledyne RH200 Method 040		Continuous
Barometric Pressure	Teledyne BP300 Method 011		Continuous
Acid Deposition	Hyteometer	DEC Lab	

Proposed changes: change acid deposition method to filter pack.

Whiteface Summit

36-031-0002



Whiteface Summit
Wilmington, NY 12997

Whiteface Summit

Address: Wilmington, NY 12997

AQS Number: 36-031-0002

DEC Number: 1567-03

County: Essex

Statistical Area:

Coordinates: Lat: 44.36608 Lon: -73.90312

This site was established in 1980 at the Atmospheric Science Research Center Lab at the Summit of Whiteface Mountain. It is a special purpose Ozone site run in cooperation with the ASRC at the University at Albany. Data from this site should not be used for NAAQS comparison as it is a high altitude research site.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

Williamson

36-117-3001

Wayne County Occupational Center



4440 Ridge Road
Williamson, NY 14589

Williamson

Address: Wayne County Occupational Center
4440 Ridge Road
Williamson, NY 14589

AQS Number: 36-117-3001
DEC Number: 5863-01
County: Wayne
Statistical Area: Rochester, NY
Coordinates: Lat: 43.23086 Lon: -77.17136

This site was established in 1979 as a downwind Ozone site for the Rochester metropolitan area. Williamson is a seasonal ozone site, located in a storage building at the Wayne County Occupational Center. The site is located in a rural, mostly agricultural area and is an important location used to verify the attainment status of the Rochester region.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous

3.2 Southern Monitoring Site Listings

Table 3.2 Location Listing for Southern Monitoring Sites

DEC Region	AIRS #	DEC #	Site Name	County	Location
1	36-059-0005	2950-10	Eisenhower Park	Nassau	740 Merrick Avenue
1	36-103-0002	5150-02	Babylon	Suffolk	72 Gaza Blvd - Water Authority
1	36-103-0009	5150-10	Holtsville	Suffolk	57 Division St. Sagamore Junior High
1	36-103-0004	5155-01	Riverhead	Suffolk	39 Sound Avenue
2	36-005-0080	7094-05	Morrisania II	Bronx	Family Care Ctr, 1225-57 Gerard Ave
2	36-005-0083	7094-06	NY Botanical Gardens Harding Laboratory	Bronx	200th Street & Southern Boulevard
2	36-005-0112	7094-08	IS 74	Bronx	730 Bryant Avenue
2	36-005-0113	7094-09	PS 154	Bronx	333 East 135th Street
2	36-005-0133	7094-10	NY Botanical Gardens Pfizer Plant Research Lab	Bronx	200th Street & Southern Boulevard
2	36-005-0110	7094-07	IS 52*	Bronx	681 Kelly Street, E 156th Street
2	36-047-0052	7095-07	PS 314	Kings	330 59th Street
2	36-047-0122	7095-43	JHS 126	Kings	424 Leonard Street
2	36-047-0121	7095-44	IS 293	Kings	284 Baltic St.
2	36-047-0118	7095-98	PS 274	Kings	800 Bushwick Ave
2	36-061-0079	7093-08	JHS 45	New York	2351 1st Avenue
2	36-061-0077	7093-12	Madison Ave	New York	400 Madison Avenue (bet 47 & 48 St)
2	36-061-0115	7093-15	IS 143†	New York	511 W 182nd Street
2	36-061-0119	7093-17	Manhattanville PO	New York	365 W 125th Street
2	36-061-0128	7093-21	PS 19	New York	185 1st Avenue
2	36-061-0134	7093-24	Division Street	New York	Division Street
2	36-061-0135	7093-25	CCNY	New York	160 Convent Avenue
2	36-081-0120	7096-13	Maspeth Library	Queens	69-70 Grand Avenue
2	36-081-0124	7096-14	PS 219	Queens	144-39 Gravett Rd (Kew Gardens)
2	36-081-0124	7096-15	Queens College II	Queens	NYSDEC Monitoring Building
2	36-085-0067	7097-01	Susan Wagner	Richmond	1200 Manor Road (near Brielle Ave)
2	36-085-0055	7097-03	Port Richmond	Richmond	364 Port Richmond Avenue
2	36-085-0111	7097-17	Fresh Kills West	Richmond	310 West Service Road
2	36-085-0114	7097-18	PS 44	Richmond	80 Maple Parkway
2	36-085-0132	7097-20	La Tourette	Richmond	1001 Richmond Hill Rd.
3	36-119-2004	5902-04	White Plains	Westchester	Water District Pumping Station

*Site operation temporarily suspended in June, 2010 until mid 2012 due to extensive construction work at school. Some equipment moved to Morrisania II.

†Site operation temporarily suspended in May, 2011 until June 2012 due to construction work at school.

Site operation terminated 12/31/2011

1	36-059-0008	2950-18	Hempstead	Nassau	Lawrence High School, Arlington Pl
3	36-119-1002	5956-01	Mamaroneck	Westchester	627 5th Ave near St. Police Barracks

BABYLON
36-103-0002



Farmingdale Water District
72 Gazza Blvd.
Babylon, NY 11735

Babylon

Address: Farmingdale Water District
72 Gazza Blvd.
Babylon, NY 11735

AQS Number: 36-103-0002
DEC Number: 5150-02
New York State County: Suffolk
Statistical Area: New York City Metropolitan Area
Coordinates: 40.74529 N -73.41919 W

The Babylon air monitoring station was originally established in the 1970's as a continuous sulfur dioxide and ozone site. Located on Long Island, downwind from New York City, the site continues to measure urban ozone levels in the New York City metropolitan area.

In 1999 a Federal Reference Method fine particulate (PM_{2.5}) sampler was added to the site. This PM_{2.5} monitor is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards.

The ozone data are reported to the AIRNow system.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 day in 3

CCNY
36-061-0135



City College of New York
The City University of New York
Administration Building
160 Convent Avenue
New York, NY 10031

CCNY

Address: City College of New York
Administration Building
160 Convent Avenue
New York, NY 10031

AQS Number: 36-061-0135
DEC Number: 7093-25
New York State County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.81976 N -73.94825 W

The City College of New York - CCNY air monitoring site was established during the summer of 2007. This site includes an ozone analyzer and a continuous fine particulate (PM_{2.5}) sampler. Fine particulate monitoring utilizes a PM_{2.5} R&P Tapered Element Oscillating Microbalance (TEOM).

In addition to Department monitoring equipment the CCNY School of Engineering operate ambient air monitoring equipment in the same location. Data from this equipment are not reported or certified by the Department.

Data from this site is reported to the AIRNow system.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous
PM _{2.5}	R&P TEOM 1400a Method 702	TEOM 50°C Gravimetric	Continuous

DIVISION STREET
36-061-0134



New York City Department of Education
Public School 124
40 Division Street
New York, NY 10002

Division Street

Address: New York City Department of Education
Public School 124
40 Division Street
New York, NY 10002

AQS Number: 36-061-0134
DEC Number: 7093-24
County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.71436 N -73.99518 W

This site was established in September 2006. Initially the site contained a continuous fine particulate (PM_{2.5}) Tapered Element Oscillating Microbalance (TEOM). In March 2007, the FRM PM_{2.5}, PM₁₀ and MetOne Speciation samplers were added following the emergency shut-down of the Canal Street Post Office (36-061-0062). Reference EPA letter: Ruvo to Lavin dated: March 14, 2007. The URG 3000 Carbon sampler was added in May 2007.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
	R&P Partisol 2025 Method 118	Gravimetric	1 day in 3
PM _{2.5} Speciation	Met One SASS Method 811	XRF	1 day in 3
Carbon	URG 3000 Method 838	IMPROVE TOR	1 day in 3
PM ₁₀	R&P Partisol 2025 Method 127	Gravimetric	1 day in 3

EISENHOWER PARK

36-059-0005



Nassau County Parks, Recreation and Museums

Eisenhower Park

740 Merrick Avenue

Westbury, NY 11590

Eisenhower Park

Address: Nassau County Park, Recreation and Museums
Eisenhower Park
740 Merrick Avenue
Westbury, NY 11590

AQS Number: 36-059-0005
DEC Number: 2950-10
New York State County: Nassau
Statistical Area: New York City Metropolitan Area
Coordinates: 40.74316 N -73.58549 W

The Eisenhower Park air monitoring station was originally established as a Nassau County Health Department air monitoring site. It was operated with support from the New York State Department of Environmental Conservation until 2000 when the Department took over complete control of the site. The continuous fine particulate (PM_{2.5}) monitoring data from this site are reported to AirNow.

NO₂ monitoring was terminated at this site on March 31, 2011. Ultrafine Particle monitoring was discontinued in June 2010.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
PM _{2.5}	R&P TEOM 1405 Method 790	TEOM Gravimetric	Continuous
Acid Deposition	Hyteometer	DEC Laboratory	Weekly Collection
Meteorological	Method 020		Continuous
Precipitation	Belfort Rain Gauge		Continuous
Relative Humidity	Method 011		Continuous
Temperature	Method 040		Continuous
Barometric Pressure	Method 011		Continuous

Proposed changes: discontinue acid deposition.

FRESH KILLS WEST

36-085-0111



**310 West Service Road
Fresh Kills Landfill
Staten Island, NY 10314**

Fresh Kills West

Address: 310 West Service Road
Fresh Kills Landfill
Staten Island, NY 10314

AQS Number: 36-085-0111
DEC Number: 7097-17
New York State County: Richmond
Statistical Area: New York City Metropolitan Area
Coordinates: 40.58027 N -74.19832 W

The Fresh Kills West air monitoring station was established in July 1999 as part of an air quality study of the Fresh Kills Landfill and the start up of the methane gas flare at the landfill. Following the end of the Landfill study, the Fresh Kills West site became part of the Department’s core ambient air monitoring program.

The continuous fine particulate (PM_{2.5}) monitoring data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400a Method 701 Method 702	TEOM 50°C Gravimetric	Continuous
Toxics	Canister Method 150	GC/MS	1 in 6 days
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 in 6 days
Meteorological	Climatronics Sonic Method 020		Continuous
Barometric Pressure	Spectra 276 Method 011		Continuous

HOLTSVILLE
36-103-0009



Sagamore Junior High School
57 Division Street
Holtsville, NY 11742

Holtsville

Address: Sagamore Junior High School
57 Division Street
Holtsville, NY 11742

AQS Number: 36-103-0009
DEC Number: 5151-10
New York State County: Suffolk
Statistical Area: New York City Metropolitan Area
Coordinates: 40.82799 N -73.05754 W

The Holtsville air monitoring station was established by the Suffolk County Department of Health Services - Division of Environmental Quality in the late 1990s. The Department established an ozone analyzer at the site during the 2006 ozone season. In June of 2010 the Department took over control of the site, following personnel changes in the Suffolk County Department of Health Services. The Department expanded its monitoring by added sulfur dioxide and fine particulate matter.

The parameters monitored and certified by NYS DEC are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous (During NYS O ₃ Season)
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
PM _{2.5}	R&P TEOM 1405 Method 790	TEOM Gravimetric	Continuous
Meteorological	MetOne Sonic Method 020		Continuous
Barometric Pressure	MetOne Method 011		Continuous
Relative Humidity	MetOne Method 011		Continuous
Temperature	MetOne Method 040		Continuous

IS 143
36-061-0115



New York City Department of Education
Junior High School 143
511 West 182nd Street
New York, NY 10033

IS 143

Address: New York City Department of Education
Junior High School 143
511 West 182nd Street
New York, NY 10033

AQS Number: 36-061-0115
DEC Number: 7093-15
County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.84888 N -73.93059 W

The IS143 site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring site. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential area of Manhattan. Data from this site are reported to AIRNow.

Proposed changes to this site: Due to extensive construction at the school, this site is expected to be temporarily shut down in the middle of 2011. Construction will continue for approximately 18 to 24 months.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 701 Method 702	TEOM 50°C Gravimetric	Continuous

IS 293
36-047-0121



New York City Department of Education
Intermediate School 293
284 Baltic Street
Brooklyn, NY 11201

IS 293

Address: New York City Department of Education
Intermediate School 293
284 Baltic Street
Brooklyn, NY 11201

AQS Number: 36-047-0121
DEC Number: 7095-44
County: Brooklyn
Statistical Area: New York City Metropolitan Area
Coordinates: 40.68419 N -73.99298 W

The Intermediate School 293 site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring site. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential area of Brooklyn. Data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

Proposed changes: close site.

IS 52
36-005-0110



New York City Department of Education
Public School 52/Middle School 302
681 Kelly Street
Bronx, NY 10455

IS 52

Address: New York City Department of Education
Public School 52/Middle School 302
681 Kelly Street
Bronx, NY 10455

AQS Number: 36-005-0110
DEC Number: 7094-07
County: Bronx
Statistical Area: New York City Metropolitan Area
Coordinates: 40.8162 N -73.9020 W

This site was established in 1999 as a replacement site for Public School 155. Initially the site contained ozone, oxides of nitrogen, sulfur dioxide, continuous PM_{2.5} and continuous PM₁₀. Following an upgrade of the electricity, additional monitoring parameters were added, creating one of the premier particulate sampling sites in New York City. The site contains criteria pollutant parameters and methods along with many experimental methods.

This site was temporarily shut down June 2010 until July 2012 due to extensive construction at the school. The monitoring for NATTS parameters was moved to Morrisania II during that period. This site is now back to full operation.

The parameters normally monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Oxides of Nitrogen	TEI 42C Method 074	Chemiluminescence	Continuous
PM _{2.5}	R&P TEOM 1400 Method 701 Method 702	TEOM Gravimetric 50°C	Continuous
	Low volume FRM R&P 2025 Method 118	Gravimetric	Daily 1 day in 3 ^a
PM _{2.5} Speciation	Met One SASS Method 811	XRF	1 day in 3
	IMPROVE Sampler	IMPROVE	1 day in 3
Carbon	URG 3000 Method 838	IMPROVE TOR	1 day in 3

Parameter	Sampling Method	Analysis Method	Schedule
PM ₁₀	R&P TEOM 1400 Method 079	TEOM Gravimetric 50°C	Continuous
	Low volume FRM ^b R&P 2025 Method 127	Gravimetric	1 day in 6 ^a
PM ₁₀ - Metals	Method 907	ICPMS	1 day in 6 ^a
PM _{2.5} – Nitrate	Thermo Scientific 8400N	---	Continuous
Sulfate	Thermo Scientific 5020i Sulfate Particulate	Pulsed Florescence	Continuous
Black Carbon	Magee Scientific Aethalometer Method 866	Optical Absorption	Continuous
Elemental Carbon/ Organic Carbon	Sunset Laboratory Method 5040	Thermal Optical	Semi-Continuous
Polycyclic Aromatic Hydrocarbons-PAH	Tisch TE 5007 Method 118	GC/MS EPA/ERG Lab	1 day in 6
Toxics	Canister Method 150	GC/MS	1 day in 6 ^a
Carbonyl	DNPH tube Method 202	HPLC - Ultraviolet Absorption	1 day in 6
Chromium	ERG Method 921	EPA/ERG	1 day in 6

^a Collocated unit

IS 74
36-005-0112



New York City Department of Education
Intermediate School 74 (MS 201)
730 Bryant Avenue
Bronx, NY 10474

IS 74

Address: New York City Department of Education
Intermediate School 74 (MS 201)
730 Bryant Avenue
Bronx, NY 10474

AQS Number: 36-005-0112

DEC Number: 7094-08

County: Bronx

Statistical Area: New York City Metropolitan Area

Coordinates: 40.81551 N -73.88553 W

The Intermediate School 74 site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring station. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential area of the Hunts Point area of the Bronx. Data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

JHS 126

36-047-0122



**New York City Department of Education
Junior High School 126
424 Leonard Street
Brooklyn, NY 11222**

JHS 126

Address: New York City Department of Education
424 Leonard Street
Junior High School 126
Brooklyn, NY 11222

AQS Number: 36-047-0122

DEC Number: 7095-43

New York State County: Kings

Statistical Area: New York City Metropolitan Area

Coordinates: 40.71961 N -73.94771 W

The JHS 126 air monitoring station was established in 2000 as a Hi-Volume PM₁₀ and Lead monitoring site. In January 2001 a Federal Reference Method fine particulate (PM_{2.5}) sampler was added. This PM_{2.5} sampler is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards. PM₁₀ sampling was discontinued December 2005. TSP-lead sampling was terminated at the end of 2009. The necessary monitoring is conducted at IS 52 in the Bronx.

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P Partisol 2025 Method 118	Gravimetric	1 day in 3

JHS 45
36-061-0079



New York City Department of Education
Junior High School 45
2351 First Avenue
New York, NY 10035

JHS 45

Address: New York City Department of Education
Junior High School 45
2351 First Avenue
New York, NY 10035

AQS Number: 36-061-0079
DEC Number: 7093-08
New York State County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.79970 N -73.93432 W

The JHS 45 air monitoring station was originally established in 1981 as a sulfur dioxide, fine and coarse particulate (dichotomous samplers) and Total Suspended Particulate site. The site was shut down in 1985 and then reestablished as a Federal Reference Method fine particulate (PM_{2.5}) monitoring site in January 2000. A duplicate PM_{2.5} sampler was installed in January 2006 after being removed from the PS 59 station to continue to provide accuracy data for the PM_{2.5} network. The FRM PM_{2.5} samplers at JHS 45 are part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5} ¹	R&P Partisol 2025 Method 118	Gravimetric	1 day in 3

¹ Collocated samplers

LA TOURETTE
36-085-0132



La Tourette Golf Course
1001 Richmond Hill Road
Staten Island, NY 10306

La Tourette

Address: La Tourette Golf Course
1001 Richmond Hill Road
Staten Island, NY 10306

AQS Number: 36-085-0132
DEC Number: 7097-20
New York State County: Richmond
Statistical Area: New York City Metropolitan Area
Coordinates: 40.58056 N -74.15178 W

The La Tourette air monitoring station was established in April 2002 as part of an air quality study of the Fresh Kills Landfill and the start up of the methane gas flare at the landfill. Following the end of the Fresh Kills Landfill study, the La Tourette station became part of the Department's core ambient air monitoring program.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Toxics	Canister Method 150	GC/MS	1 in 6 days
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 in 6 days

Proposed changes: close site.

MANHATTANVILLE POST OFFICE

36-061-0119



United States Post Office - Manhattanville Station
365 West 125th Street
New York, NY 10027

Manhattanville Post Office

Address: United States Post Office - Manhattanville Station
365 West 125th Street
New York, NY 10027

AQS Number: 36-061-0119
DEC Number: 7093-17
County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.81133 N -73.95321 W

The Manhattanville Post Office site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring site. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential and commercial area of Manhattan. Data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

Proposed changes: close site.

MASPETH LIBRARY
36-081-0120



Queens Public Library - Maspeth
69-70 Grand Avenue
Maspeth, NY 11378

Maspeth Library

Address: Queens Public Library - Maspeth
69-70 Grand Avenue
Maspeth, NY 11378

AQS Number: 36-081-0120

DEC Number: 7096-13

County: Queens

Statistical Area: New York City Metropolitan Area

Coordinates: 40.72698 N -73.89313 W

The Maspeth Library was established as a continuous fine particulate (PM_{2.5}) monitoring site in 2000. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential area in the vicinity of two major New York City roadways, the Long Island Expressway and the Brooklyn-Queens Expressway. The continuous fine particulate (PM_{2.5}) monitoring data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

MORRISANIA II

36-005-0080



**Morrisania Diagnostic and Treatment Center
1225-57 Gerard Avenue
Bronx, NY 10452**

Morrisania II

Address: Morrisania Diagnostic and Treatment Center
1225-57 Gerard Avenue
Bronx, NY 10452

AQS Number: 36-005-0080
DEC Number: 7094-05
New York State County: Bronx
Statistical Area: New York City Metropolitan Area
Coordinates: 40.83606 N -7N -73.92009 W

The Morrisania II air monitoring station was originally established in 1989 as a Hi-Volume PM₁₀ site. In 1990 ozone, sulfur dioxide and oxides of nitrogen analyzers were added. PM₁₀ was subsequently discontinued. A Federal Reference Method fine particulate (PM_{2.5}) sampler was added in 1999. In May of 2000 all continuous analyzers were discontinued and the site became a stand-alone PM_{2.5} site. The FRM PM_{2.5} sampler at Morrisania II is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards

Following the construction at school where the IS 52 monitoring station is located, equipment for the National Air Toxics Trends Station (NATTS) program was moved to Morrisania II. This equipment was returned to the IS 52 site in July 2012.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P Partisol 2025 Method 118	Gravimetric	1 day in 3
PM ₁₀ ^a	Low volume FRM R&P 2025 Method 127	Gravimetric	1 day in 6
PM ₁₀ – Metals ^a	Method 907	ICPMS	1 day in 6
Black Carbon ^a	Magee Scientific Aethalometer Method 866	Optical Absorption	Continuous
Polycyclic Aromatic Hydrocarbons-PAH ^a	Tisch TE 5007 Method 118	GC/MS EPA/ERG Lab	1 day in 6
Toxics ^a	Canister Method 150	GC/MS	1 day in 6
Carbonyl ^a	DNPH tube Method 202	HPLC - Ultraviolet Absorption	1 day in 6
Chromium ^a	ERG Method 921	EPA/ERG	1 day in 6

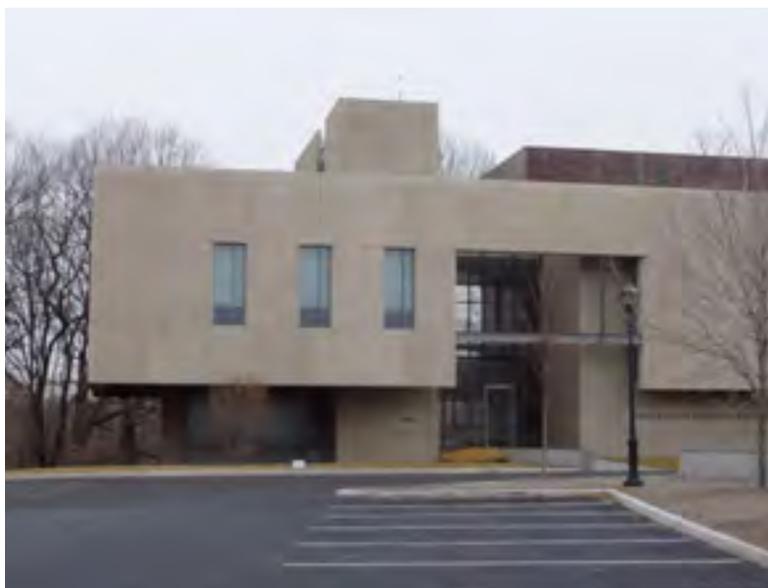
^a NATTS Equipment – temporarily at Morrisania during construction at IS 52

Proposed changes: move NATTS parameters back to original site at IS 52; replace FRM PM_{2.5} monitor with continuous PM_{2.5} TEOM monitor.

NEW YORK BOTANICAL GARDEN

Pfizer Plant Research Laboratory

36-005-0133



Harding Laboratory

36-005-0083



New York Botanical Garden	
200 th Street and Southern Blvd. Bronx, NY 10458-5126	
Pfizer Plant Research Laboratory	Harding Laboratory
AQS Number: 36-005-0133	AQS Number: 36-005-0083
DEC Number: 7094-10	DEC Number: 7094-06
New York State County: Bronx Statistical Area: New York City Metropolitan Area	
Coordinates: 40.86790 N -73.87809 W	Coordinates: 40.86585 N -73.88083 W

This site was established in the Harding Laboratory at the New York Botanical Garden in January 1995. This site was originally established for the Photochemical Assessment Monitoring Station (PAMS) program with some summa canister sampling beginning in June 1994. During the summer of 2006, the New York Botanical Garden completed construction on the Pfizer Plant Research Laboratory. This is a state of the art laboratory and research facility that replaced the Harding laboratory. Through an agreement with the Department, NYBG provided space in the new facility for the Department’s ambient air monitoring station.

Starting with the 2006 PAMS season the continuous GC was moved to the new monitoring site at the Pfizer Lab. The ozone, sulfur dioxide, oxides of nitrogen, carbon monoxide, methane/non-methane, canisters, and carbonyl samplers were moved to the Pfizer Lab the end of December 2006. The FRM PM_{2.5} sampler was moved to the Pfizer Laboratory on January 1, 2008. The FRM fine particulate (PM_{2.5}) sampler installed at the Pfizer Laboratory is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards.

On January 9, 2008 the Mercury Deposition Network (MDN) Automatic Precipitation Sampler and the ETI Instrument Systems NOAH IV Total Precipitation Measurement System was installed as part of establishing a MDN site at Pfizer Laboratory. The Tekran Elemental and Reactive Gas Mercury equipment was installed in August, 2008.

The meteorological equipment remains at the Harding Laboratory. At this time the Garden’s future plans for the Harding Laboratory building are unknown, however it is anticipated that this building will be torn down in the future.

This site is being utilized for the New York City Community Air Survey as part of the PlaNYC initiative.

The parameters monitored are indicated in the following tables:

Pfizer Plant Research Laboratory

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Sulfur Dioxide	TEI 43C Method 060	Pulsed Fluorescence	Continuous
Low Level SO ₂	TEI 43i TLE Method 560	Pulsed Fluorescence	Continuous
Oxides of Nitrogen (NO, NO ₂ , NO _x)	TEI 42C Method 074	Chemiluminescence	Continuous
Carbon Monoxide	TEI 48C Method 054	Non Dispersive Infrared	Continuous
PM _{2.5}	R&P Partisol 2025 Method 118	Gravimetric	1 day in 3
NMOC - Total HC	Method 160 Method 161	Flame Ionization	Continuous
PAMS precursor	Method 128	GC/FID	Continuous
Toxics	Canister Method 150	GC/MS	1 day in 6
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 day in 6 Daily (PAMS)
Mercury Elemental/Reactive Gas	Tekran Mercury Vapor Analyzer	Cold Vapor Atomic Fluorescence Spectrometry	Continuous
Precipitation - MDN	N-CON Systems MDN 00-125-2 Automatic Precipitation Sampler	---	Weekly collection
	NOAH IV Total Precipitation Measurement System	---	

Harding Laboratory

Parameter	Sampling Method	Analysis Method	Schedule
Acid Deposition	Hyteometer	DEC Laboratory	Weekly collection
Wind Speed/direction	Method 020	---	Continuous
Precipitation	Tipping Bucket	---	Event based
Relative Humidity	Method 011	---	Continuous
Temperature	Method 040	---	Continuous
Barometric Pressure	Method 011	---	Continuous

Proposed changes: discontinue continuous PAMS precursor GC measurements.

PORT RICHMOND
36-085-0055



United States Post Office - Port Richmond Station
364 Port Richmond Avenue
Staten Island, NY 10302

Port Richmond

Address: United States Post Office - Port Richmond Station
364 Port Richmond Avenue
Staten Island, NY 10302

AQS Number: 36-085-0055
DEC Number: 7097-03
New York State County: Richmond
Statistical Area: New York City Metropolitan Area
Coordinates: 40.63307 N -74.13719 W

The Port Richmond air monitoring station was originally established as a Hi-Volume PM₁₀ site in 1984. In December 1999, a Federal Reference Method fine particulate (PM_{2.5}) sampler was installed. This FRM PM_{2.5} sampler is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards. In April 2011 a TEOM was added to this site following the shutdown of the PS 44 monitoring station.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 701 Method 702	TEOM Gravimetric 50°C	Continuous
	Low volume FRM R&P 2025 Method 118	Gravimetric	1 day in 3

PS 154
36-005-0113



New York City Department of Education
Public School 154
333 East 135th Street
Bronx, NY 10454

PS 154

Address: New York City Department of Education
Public School 154
333 East 135th Street
Bronx, NY 10454

AQS Number: 36-005-0113
DEC Number: 7094-09
County: Bronx
Statistical Area: New York City Metropolitan Area
Coordinates: 40.80833 N -73.92612 W

The Public School 154 site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring station. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential area of the Bronx, in the vicinity of the Major Deegan Expressway. Data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

Proposed changes: close site.

PS 19
36-061-0128



New York City Department of Education
Public School 19
185 First Avenue
New York, NY 10003

PS 19

Address: New York City Department of Education
Public School 19
185 First Avenue
New York, NY 10003

AQS Number: 36-061-0128
DEC Number: 7093-21
New York State County: New York
Statistical Area: New York City Metropolitan Area
Coordinates: 40.73000 N -73.98446 W

The PS 19 air monitoring station was established as a Federal Reference Method fine particulate (PM_{2.5}) monitoring site in October 2001. The FRM PM_{2.5} sampler at PS 19 is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards. The continuous PM_{2.5} TEOM was added in June, 2007.

Following the shutdown of PS59, the low volume PM₁₀ R&P 2025 instrument was added to this site, however electrical power problems have delayed the start up of this sampler.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	Low volume FRM R&P 2025 Method 118	Gravimetric	1 day in 3
	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous
PM ₁₀	Low volume FRM R&P 2025 Method 127	Gravimetric	1 day in 3

Proposed changes: discontinue PM₁₀.

PS 274
36-047-0118



New York City Department of Education
Public School 274
800 Bushwick Avenue
Brooklyn, NY 11221

PS 274

Address: New York City Department of Education
Public School 274
800 Bushwick Avenue
Brooklyn, NY 11221

AQS Number: 36-047-0118
DEC Number: 7095-98
County: Brooklyn
Statistical Area: New York City Metropolitan Area
Coordinates: 40.69454 N -73.92769 W

The Public School 274 site was established in 2000 as a continuous fine particulate (PM_{2.5}) monitoring station. The site utilizes a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential/industrial area of Brooklyn. The continuous fine particulate (PM_{2.5}) monitoring data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 701 Method 702	TEOM 50°C Gravimetric	Continuous
Toxics	Canister Method 150	GC/MS	1 in 6 days

PS 314
36-047-0052



New York City Department of Education
Public School 314
330 59th Street
Brooklyn, NY 11220

PS 314

Address: New York City Department of Education
Public School 314
330 59th Street
Brooklyn, NY 11220

AQS Number: 36-047-0052
DEC Number: 7095-07
County: Brooklyn
Statistical Area: New York City Metropolitan Area
Coordinates: 40.64182 N -74.01871 W

The Public School 314 site was first established in 1982 as a Hi-Volume inhalable particulate (PM₁₀) station. In 2003 the site became a continuous fine particulate (PM_{2.5}) monitoring site with the installation of a R&P Tapered Element Oscillating Microbalance (TEOM). This site is located in an urbanized, residential/industrial area in the vicinity of the Gowanus Expressway. Data from this site are reported to AIRNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
PM _{2.5}	R&P TEOM 1400 Method 702	TEOM 50°C Gravimetric	Continuous

QUEENS COLLEGE II AMBIENT AIR MONITORING STATION

**Queens College II
36-081-0124**



**Public School 219 - Queens
36-081-0124**



Queens College II	Public School 219 - Queens
NYS DEC Air Monitoring Building CUNY - Queens College Campus 65-30 Kissena Blvd. Flushing, NY 11367	144-39 Gravett Road Flushing, NY 11367
DEC Number (Queens College II): 7096-15	DEC Number (PS 219): 7096-14
AQS Number: 36-081-0124	
New York State County: Queens Statistical Area: New York City Metropolitan Area	
Coordinates: 40.73614 N -73.82153 W	Coordinates: 40.73619 N -73.82318 W

The Department originally began monitoring at Queens College for ozone and sulfur dioxide in 1978. This continued until 1997 when the monitoring equipment was removed from Queens College during a major building renovation project on the campus. The AQS number for the original Queens College site was 36-081-0004. The Queens College II site was originally established during the summer of 2001 for an intensive air pollution study that was coordinated with the State University of New York - University of Albany - Atmospheric Sciences Research Center. In September 2006 the site was redesigned and expanded in a newly constructed building on the Queens College campus. In the future, this site will be one of three NCore sites in New York State.

The FRM fine particulate (PM_{2.5}) monitor located at Queens College is part of the overall PM_{2.5} monitoring network used for comparison to the National Ambient Air Quality Standards. This is monitoring location is in a highly populated residential area. The site is in close proximity to sensitive groups, primarily young children, at Public School 219. Photochemical Assessment Monitoring Station program sampling began in 2001, however, continuous monitoring with Gas Chromatography for PAMS is not done at this site, as it is conducted at the New York Botanical Garden station in the Bronx.

This site is being utilized for the New York City Community Air Survey as part of the PlaNYC initiative.

Changes to site:

NCore parameters, including expanding the trace level pollutant monitoring equipment will be added in the future.

Queens College II: CUNY - Queens College Campus/PS 219

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Low Level SO ₂	TEI 43i TLE Method 560	Pulsed Fluorescence	Continuous
Oxides of Nitrogen (NO, NO ₂ , NO _X)	TEI 42C Method 074	Chemiluminescence	Continuous
NO _Y	API 200EU Method 082	Chemiluminescence	Continuous
Low Level CO	API 300EU Method 593	Non Dispersive Infrared	Continuous
PM _{2.5}	R&P Partisol 2025 Method 118	Gravimetric	Daily
PM _{2.5} Speciation	MetOne SASS Method 811	XRF	1 day in 3
PM _{2.5} , PM _{course} , PM ₁₀	TEI 1405 DF Method 790	TEOM 30°C Gravimetric	Continuous
PM ₁₀	R&P Partisol 2025 Method 127	Gravimetric	Daily
Carbon	URG 3000 Method 838	IMPROVE TOR	1 day in 3
	Sunset Laboratory Method 5040	Thermal Optical	Semi-continuous
Sulfate	TEI 5020i	Pulsed Fluorescence	Semi-continuous
NMOC - Total HC	Method 160 Method 161	Flame Ionization	Continuous
Toxics	Canister Method 150	GC/MS	1 day in 6
Carbonyl	DNPH Cartridge Method 202	HPLC - Ultraviolet Absorption	1 day in 6
Wind Speed/direction	Method 020	---	Continuous
Temperature	Method 040	---	Continuous
Barometric Pressure	Method 011	---	Continuous
Relative Humidity	Method 011	---	Continuous

RIVERHEAD

36-103-0004



Cornell University
College of Agriculture and Life Sciences
Long Island Horticultural Research Center
3059 Sound Avenue
Riverhead, NY 11901

Riverhead

Address: Cornell University
College of Agriculture and Life Sciences
Long Island Horticultural Research Center
3059 Sound Avenue
Riverhead, NY 11901

AQS Number: 36-103-0004
DEC Number: 5155-01
New York State County: Suffolk
Statistical Area: New York City Metropolitan Area
Coordinates: 40.96078 N -72.71238 W

The Riverhead air monitoring station was established in 1992 as a seasonal ozone site. It is utilized as a regional ozone site, given its downwind proximity to New York City. The ozone data are reported to the AIRNow system.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous (during the NYS Ozone Season)

SUSAN WAGNER
36-085-0067



**New York City Department of Education
Susan E. Wagner High School
1200 Manor Avenue
Staten Island, NY 10314**

Susan Wagner

Address: New York City Department of Education
Susan E. Wagner High School
1200 Manor Avenue
Staten Island, NY 10314

AQS Number: 36-085-0067
DEC Number: 7097-01
New York State County: Richmond
Statistical Area: New York City Metropolitan Area
Coordinates: 40.59664 N -74.12525 W

The Susan Wagner ambient air monitoring station was established in the 1970's. This site is one of the long term ozone trends sites in New York City. The site is a year-round ozone site. The ozone data from this site are reported to AirNow.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
Meteorological	Method 020		Continuous
Barometric Pressure	Method 011		Continuous
Relative Humidity	Method 011		Continuous
Temperature	Method 040		Continuous

WHITE PLAINS
36-119-2004



White Plains Water Pump Station Garage
240 Orchard Street
White Plains, NY 10601

White Plains

Address: White Plains Water Pump Station Garage
240 Orchard Street
White Plains, NY 10601

AQS Number: 36-119-2004
DEC Number: 5902-04
New York State County: Westchester
Statistical Area: New York City Metropolitan Area
Coordinates: 41.05192 N -73.76366 W

The White Plains ambient air monitoring station was originally established in the 1970's. The ozone data are reported to the AirNow system.

Acid Deposition monitoring was terminated at this site December 31, 2010.

The parameters monitored are indicated in the following table:

Parameter	Sampling Method	Analysis Method	Schedule
Ozone	TEI 49C Method 047	Ultraviolet Photometric	Continuous
PM _{2.5}	R&P TEOM 1405 Method 079	TEOM Gravimetric	Continuous
Meteorological	Method 020		Continuous

4. Criteria Contaminants

EPA is required to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The Clean Air Act requires periodic review of the science upon which the standards are based and the standards themselves. Listed below are the NAAQS for six principal pollutants, which are called "criteria" pollutants.

Table 4.1 National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Times	Level	Averaging Times
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾		
Lead	0.15 µg/m ³⁽²⁾	Rolling 3-month Average	Same as Primary	
Nitrogen Dioxide	53 ppb	Annual (Arithmetic Mean)	Same as Primary	
	100 ppb	1-hour ⁽³⁾	None	
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁽⁴⁾	Same as Primary	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁽⁵⁾ (Arith. Mean)	Same as Primary	
	35 µg/m ³	24-hour ⁽⁶⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁷⁾	Same as Primary	
	0.08 ppm (1997 std)	8-hour ⁽⁸⁾	Same as Primary	
	0.12 ppm	1-hour ⁽⁹⁾ Not applicable in NYS	Same as Primary	
Sulfur Oxides	75 ppb	1-hour ⁽¹⁰⁾	3-hour ⁽¹⁾	0.5 ppm (1300 µg/m ³)

- (1) Not to be exceeded more than once per year.
- (2) Effective 1/12/2009, replaces the previous quarterly average value of $1.5\mu\text{g}/\text{m}^3$.
- (3) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
- (4) Not to be exceeded more than once per year on average over 3 years.
- (5) To attain this standard, the 3-year average of the weighted annual mean $\text{PM}_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed $15.0\mu\text{g}/\text{m}^3$.
- (6) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed $35\mu\text{g}/\text{m}^3$ (effective December 17, 2006).
- (7) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
- (8) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(c) EPA is in the process of reconsidering these standards (set in March 2008).
- (9) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1 .
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.
- (10) Effective August 23, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

4.1 Carbon Monoxide

Carbon monoxide, a colorless and odorless gas, is produced as a primary pollutant during the combustion of fossil and biomass fuels. Vegetation also can emit CO directly into the atmosphere as a metabolic by-product. Sources such as motor vehicles, non-road combustion engines or vehicles, and biomass burning can cause high concentrations of CO in the outdoor environment. Indoor sources include unvented, malfunctioning, or misused combustion appliances, combustion engines in garages or basements, and tobacco combustion. In both of these environments, CO is of direct concern because of the health effects that can result from human exposure to these high concentrations.

CO enters the bloodstream through the lungs and reduces oxygen delivery to the body's organs and tissues. The health threat from levels of CO sometimes found in the ambient air is most serious for those who suffer from cardiovascular disease such as angina pectoris. At much higher levels of exposure not commonly found in ambient air, CO can be poisonous, and even healthy individuals may be affected. Visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, and difficulty in performing complex tasks are all associated with exposure to elevated CO levels.

There are two primary NAAQS for ambient CO: a 1-hour average of 35 ppm and an 8-hour average of 9 ppm. These concentrations are not to be exceeded more than once per year. There currently are no secondary standards for CO.

Motor vehicle exhaust contributes about 60 percent of all CO emissions nationwide. High concentrations of CO generally occur in areas with heavy traffic congestion. Other sources of CO emissions include industrial processes, non-transportation fuel combustion, and natural sources such as wildfires. Peak CO concentrations typically occur during the colder months of the year when CO automotive emissions are greater and nighttime inversion conditions are more frequent.

Technological advancements in pollution control have brought about a downward trend for ambient CO concentrations over the past few decades. According to EPA estimates, annual CO emissions decreased from 197.3 million tons in 1970 to 89 million tons in 2005 nationally.

The number of monitors and concentration trends chart over the years in New York State are depicted in Figure 4.1. It clearly demonstrates that the current ambient levels of CO are well below the NAAQS, in spite of the continual increase in automobiles and vehicle-miles traveled in the State. As of 2002, all counties in the State have achieved attainment designation.

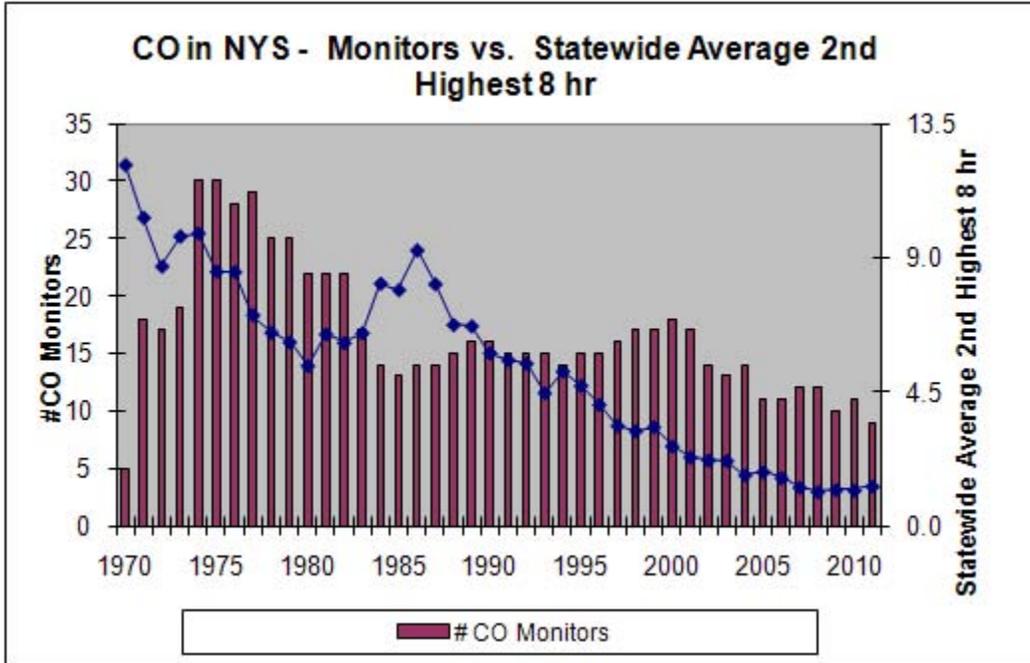


Figure 4.1 Carbon Monoxide Monitors and Concentration Trends

NYSDEC uses TEI Model 48C instruments that employ the NDIR gas filter correlation method for the continuous measurement of CO. Currently there are eight CO monitors in operation statewide as shown in Figure 4.2.

 New York State Dept of Environmental Conservation
2012 Ambient Air Monitoring Network

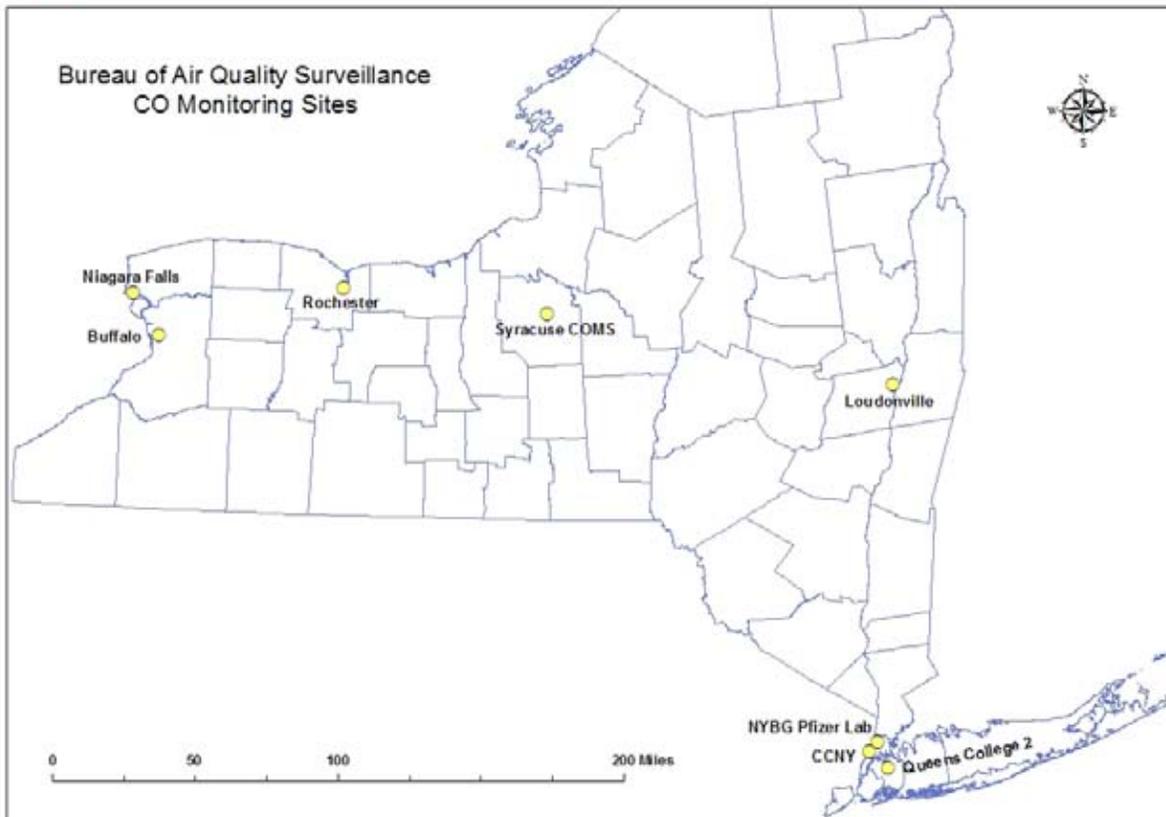


Figure 4.2 Location Map for Carbon Monoxide Monitoring Sites

4.2 Nitrogen Dioxide

Many chemical species of nitrogen oxides (NO_x) exist, but the air pollutant species of most interest from the point of view of human health is nitrogen dioxide (NO_2). Nitrogen dioxide is soluble in water, reddish-brown in color, and a strong oxidant.

Nitrogen dioxide is an important atmospheric trace gas, not only because of its health effects but also because (a) it absorbs visible solar radiation and contributes to impaired atmospheric visibility; (b) as an absorber of visible radiation it could have a potential direct role in global climate change if its concentrations were to become high enough; (c) it is, along with nitric oxide (NO), a chief regulator of the oxidizing capacity of the free troposphere by controlling the build-up and fate of radical species, including hydroxyl radicals; and (d) it plays a critical role in determining ozone (O_3) concentrations in the troposphere because the photolysis of nitrogen dioxide is the only key initiator of the photochemical formation of ozone, whether in polluted or unpolluted atmospheres.

Natural sources include intrusion of stratospheric nitrogen oxides, bacterial and volcanic action, and lightning. The major source of anthropogenic emissions of nitrogen oxides into the atmosphere is the combustion of fossil fuels in stationary sources (heating, power generation) and in motor vehicles (internal combustion engines).

In most ambient situations, nitric oxide is emitted and transformed into nitrogen dioxide in the atmosphere. Oxidation of nitric oxide by atmospheric oxidants such as ozone occurs rapidly, even at the low levels of reactants present in the atmosphere. Consequently, this reaction is regarded as the most important route for nitrogen dioxide production in the atmosphere. Other contributions of nitrogen dioxide to the atmosphere come from specific non-combustion industrial processes, such as the manufacture of nitric acid, the use of explosives and welding. Indoor sources include tobacco smoking and the use of gas-fired appliances and oil stoves.

Nitrogen dioxide is the most widespread and commonly found nitrogen oxide and is a matter of public health concern. The most troubling health effects associated with short term exposures (i.e., less than 3 hours) to NO_x at or near the ambient NO_x concentrations seen in the United States include cough and increased changes in airway responsiveness and pulmonary function in individuals with preexisting respiratory illnesses, as well as increases in respiratory illnesses in children 5 to 12 years old. Evidence suggests that long-term exposures to NO_x may lead to increased susceptibility to respiratory infection and may cause structural alterations in the lungs.

Atmospheric transformation of NO_x can lead to the formation of ozone and nitrogen-bearing particles (e.g., nitrates and nitric acid). As discussed in the ozone and particulate matter sections of this document, exposure to both PM and O_3 is associated with adverse health effects.

Nitrogen oxides contribute to a wide range of effects on public welfare and the environment, including global warming and stratospheric ozone depletion. Deposition of nitrogen can lead to fertilization, eutrophication, or acidification of terrestrial, wetland, and aquatic (e.g., fresh water bodies, estuaries, and coastal water) systems. These effects can alter competition between existing species, leading to changes in the number and type of species (composition) within a community. For example, eutrophic conditions in aquatic systems can produce explosive algae growth leading to a depletion of oxygen in the water and/or an increase in levels of toxins harmful to fish and other aquatic life.

The level for both the primary and secondary NAAQS for NO₂ is 0.053 ppm annual arithmetic average (mean), not to be exceeded. This past January EPA revised the NAAQS to include an hourly standard of 0.100 ppm. Figure 4.3 shows the number of monitoring sites and NO₂ concentration trends over the years. The current ambient levels of NO₂ observed in New York State are well below the NAAQS.

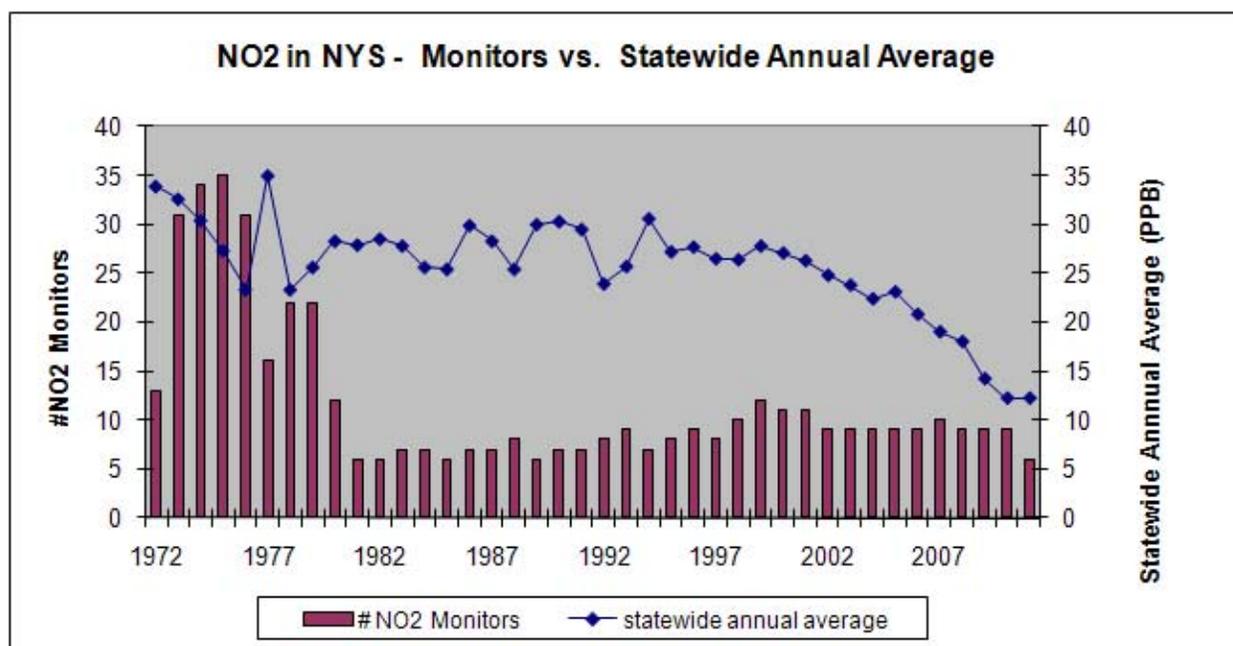


Figure 4.3 Nitrogen Dioxide Monitors and Concentration Trends

In New York, the TEI Model 42C instruments are deployed for continuous NO₂ measurements using the gas phase chemiluminescence method. Currently there are five NO_x monitoring sites statewide, and an NO/NO_y monitor in Rochester as shown in Figure 4.4. NO/NO_y measurements are included within the NCore multi-pollutant site requirements and the PAMS program. These NO/NO_y measurements will produce conservative estimates for NO₂ that can be used to ensure tracking continued compliance with the NO₂ NAAQS. NO/NO_y monitors are used at these sites because it is important to collect data on total reactive nitrogen species for understanding O₃ photochemistry.

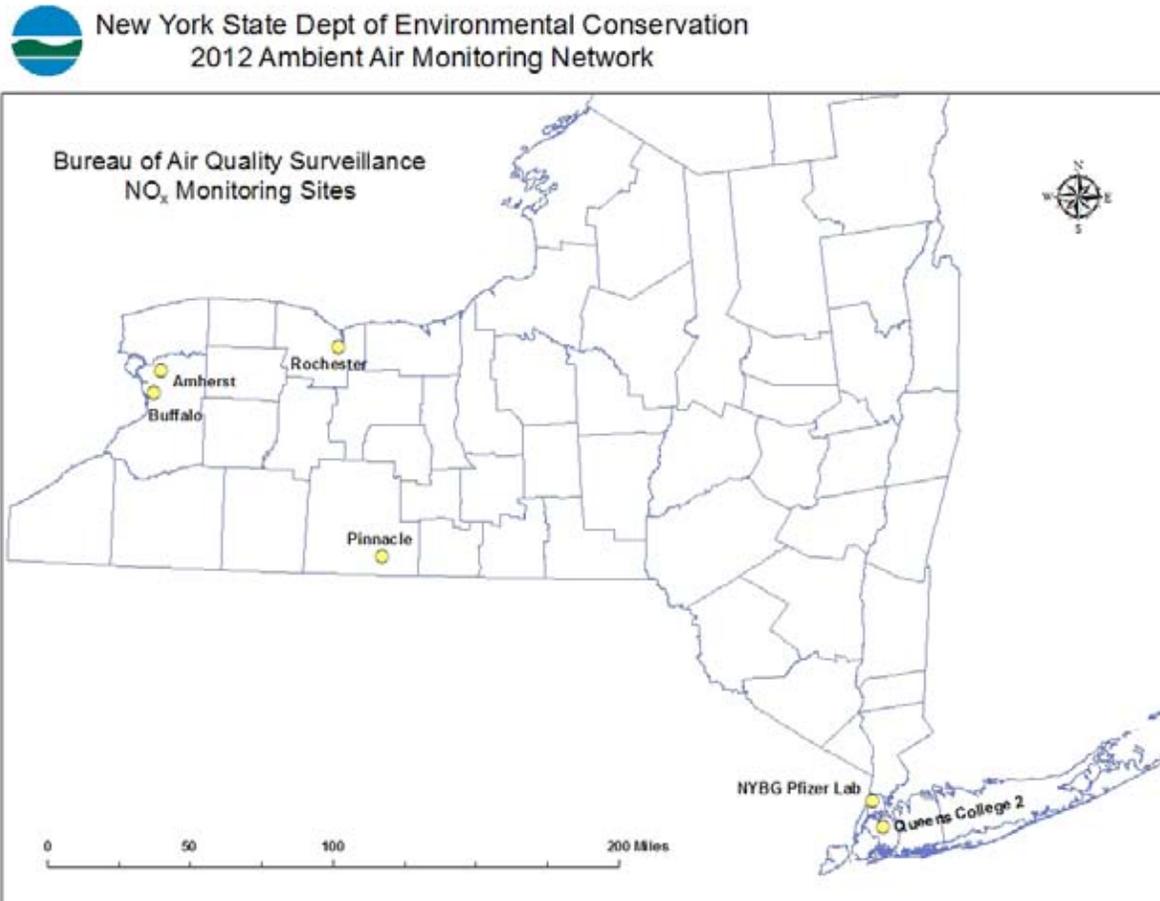


Figure 4.4 Location Map for NO_x Monitoring Sites

Although ambient NO₂ levels are not expected to contravene the NAAQS, monitoring is necessary due to it being an ozone precursor, and to track the effectiveness of emission reduction programs. Under the new NO_x rule that became effective January 22, 2010 each MSA with population larger than 500,000 will be required to operate a near-road monitor beginning in 2013. New York State will need to establish such a site in each of the following areas: Albany-Schenectady-Troy, Buffalo-Niagara Falls, Poughkeepsie-Newburgh-Middletown, Nassau-Suffolk, New York-White Plains, Rochester and Syracuse. One urban community wide monitor will be located in each of the three MSAs with population greater than 1 million: New York, Buffalo and Rochester. Furthermore, the Regional Administrators at their discretion, have the authority to require 40 additional sites nationwide in communities where susceptible and vulnerable populations are located. New York is working closely with EPA Region 2 to implement this rule.

4.3 Lead

Elemental lead (Pb) possesses an array of useful physical and chemical properties, making it among the first metals to be extracted and used by humankind. It has a relatively low melting point (327.5°C), is a soft, malleable, and ductile metal, a poor electrical conductor, and is easily cast, rolled and extruded. Although sensitive to environmental acids, after exposure to environmental sulfuric acid (H₂SO₄), metallic Pb becomes impervious to corrosion due to weathering and submersion in water. This effect is due to the fact that Pb lead sulfate (PbSO₄), the relatively insoluble precipitate produced by reaction of Pb with H₂SO₄, forms a protective barrier against further chemical reactions. This aspect of its chemistry made Pb especially convenient for protective surface coatings (e.g. paint), roofing, containment of corrosive liquids, and (until the discovery of its adverse health effects), construction of water supply systems.

Pb will only exist in the vapor phase at or above 1750°C. Therefore, at ambient atmospheric temperatures, elemental Pb will deposit to surfaces or exist in the atmosphere as a component of atmospheric aerosol.

Exposure to lead occurs through ingestion of lead in food, water, soil, or dust and through inhalation. It accumulates in the blood, bones, and soft tissues. Lead can also adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and/or behavioral disorders. Even at low doses, Pb exposure is associated with changes in fundamental enzymatic, energy transfer, and homeostatic mechanisms in the human body. Additionally, even low levels of Pb exposure may cause central nervous system damage in fetuses and children. Recent studies show that neurobehavioral changes may result from Pb exposure during the child's first years of life and that lead may be a factor in high blood pressure and subsequent heart disease.

Airborne lead can also have adverse impacts on the environment. Wild and domestic grazing animals may ingest lead that has deposited on plant or soil surfaces or that has been absorbed by plants through leaves or roots. Animals, however, do not appear to be more susceptible or more sensitive to adverse effects from lead than are humans. Therefore, the secondary standard for lead is identical to the primary standard.

In November of 2008 EPA published the final rule for the revision of the NAAQS for lead. The primary lead standard was revised to 0.15µg/m³ in total suspended particles (Pb-TSP). The averaging time was changed to a rolling 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period. The revised secondary standard was set to be identical in all respects to the new primary standard. These new standards became effective on January 12, 2009, superseding the old standard of quarterly average concentration not to exceed 1.5µg/m³. As part of the lead monitoring requirements, monitoring agencies are required to monitor ambient air near lead sources which are expected to or have been shown to have a potential to contribute to a 3-month average lead concentration in ambient air in excess of the level of the NAAQS. At a minimum, monitoring agencies must monitor near lead sources that emit 1.0 ton

per year (tpy) or more. Monitoring is also required in each CBSA with a population equal to or greater than 500,000 people as determined by the latest available census figures. Revisions to the monitoring requirements pertaining to where State and local monitoring agencies would be required to conduct lead monitoring were finalized and became effective January 26, 2011. The new regulations replaced the population oriented monitoring requirement with a requirement to add Pb monitors to the urban NCore monitors. The EPA also lowered the emission threshold from 1.0 tpy to 0.50 tpy for industrial sources of lead (e.g., lead smelters and foundries). However, the emission threshold for airports was maintained at 1.0 tpy. In addition, an airport monitoring study will be implemented to determine the need for monitoring of airports which emit less than 1.0 tpy of lead. Under this new rule lead monitoring is required for a minimum of one year at 15 additional airports that have been identified as having characteristics that could lead to ambient lead concentrations approaching or exceeding the lead NAAQS. Brookhaven and Republic airports in Suffolk County, New York have been designated as such. Monitoring at Brookhaven Airport commenced in October 2011. The Republic Airport monitoring is expected to begin in the second quarter of 2012 due to protracted site lease negotiations.

Particulate lead samples are collected on glass fiber filters using a standard TSP high volume sampler which are subsequently analyzed by the laboratory using atomic absorption spectroscopy. Under the new rule, EPA is allowing Pb-PM₁₀ in lieu of Pb-TSP where the maximum 3-month arithmetic mean Pb concentration is expected to be less than 0.10 $\mu\text{g}/\text{m}^3$ (i.e., two thirds of the NAAQS) and where sources are not expected to emit ultra-coarse Pb. The population oriented Pb monitors at the NCore or NATTS sites are located away from known sources of Pb and will utilize Pb-PM₁₀ samplers.

Figure 4.5 depicts the number of monitoring sites and lead concentration trends for New York State over the years.

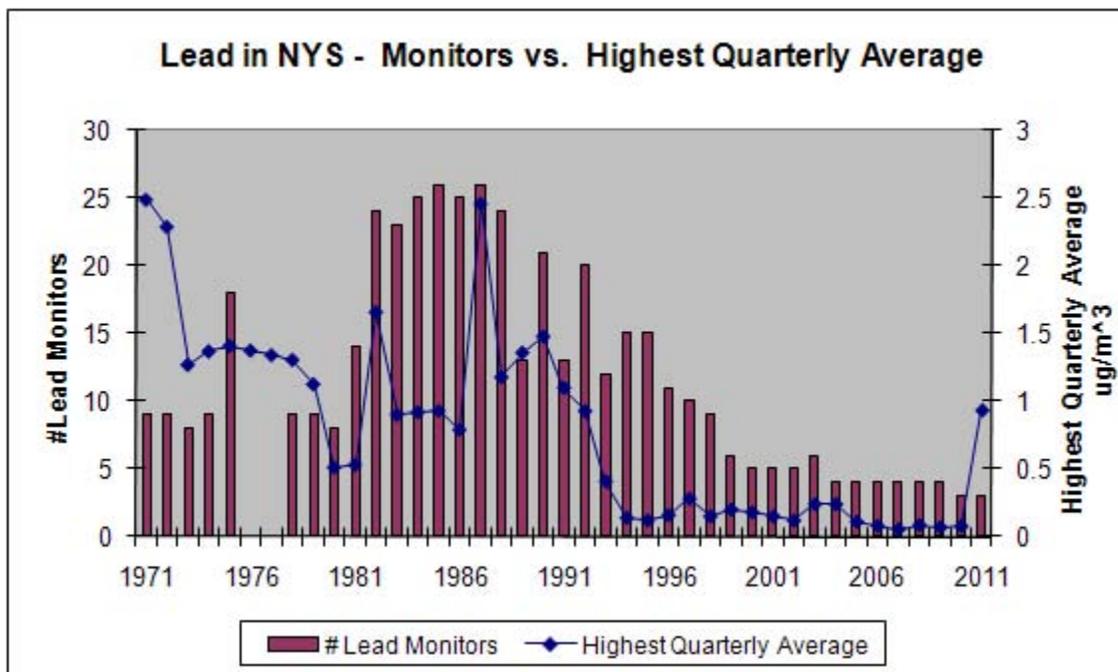


Figure 4.5 Lead Monitors and Concentration Trends

Currently there are four Pb-TSP monitors (one collocated) in operation in Middletown, where a lead acid battery recycling facility is located, and two urban CBSA monitors (low volume PM₁₀) at the NATTS sites in the Bronx and Rochester. The source oriented monitoring sites (AQS site ID # 36-071-3001, 36-071-3002, 36-071-3004) are in place as the facility has the potential to contribute to a 3-month average lead concentration in ambient air in excess of the level of the NAAQS. Routine data review showed that during the first quarter of 2011, there were a couple of sample dates that showed high levels of lead, which would lead to contravention of the new standard. Investigations at the facility led to enforcement actions although specific causes for the observed values were not discovered. Consequently an additional low volume PM₁₀ sampler was put in place to collect daily filter samples for mass measurement and lead analysis using XRF in August.

4.4 Particulate Matter

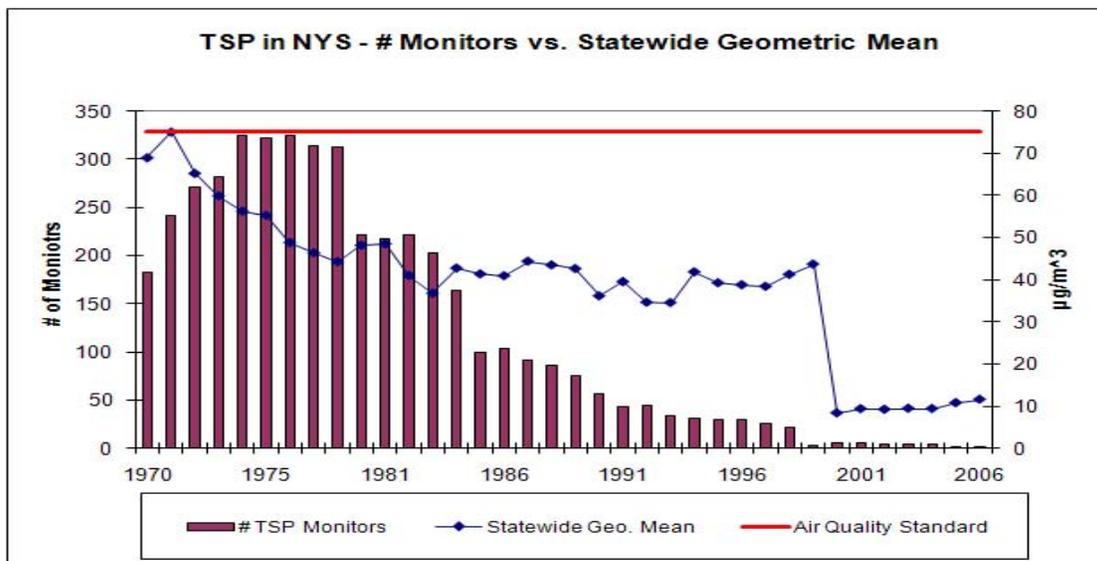
4.4.1 Total Suspended Particulate

Particulate matter is the generic term for a broad class of chemically and physically diverse substances that exist as discrete particles (liquid droplets or solids) over a wide range of sizes. Particles originate from a variety of anthropogenic stationary and mobile sources as well as natural sources. Particles may be emitted directly or formed in the atmosphere by

transformations of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. The chemical and physical properties of PM vary greatly with time, location, meteorology, and source category, thus complicating the assessment of health and welfare effects.

EPA first established national ambient air quality standards for PM in 1971. The reference method specified for determining attainment of the original standards was the high-volume sampler, which collects PM up to a nominal size of 25 to 45 micrometers (μm), referred to as total suspended particles or TSP. The primary standards (measured by the indicator TSP) were $260\mu\text{g}/\text{m}^3$ 24-hour average, not to be exceeded more than once per year, and $75\mu\text{g}/\text{m}^3$ annual geometric mean. The secondary standard was $150\mu\text{g}/\text{m}^3$ 24-hour average, not to be exceeded more than once per year. These standards were in place until 1987 when EPA changed the particle indicator from TSP to PM_{10} , the latter referring to particles with a mean aerodynamic diameter less than or equal to $10\mu\text{m}$.

Figure 4.6 shows the number of monitoring sites and the composite annual geometric means of TSP over the years. Trace metal analysis was also performed on the TSP filters until 1998. NYSDEC terminated the TSP sampling program when DOH could no longer provide laboratory analysis support.



4.6 Total Suspended Particulate Monitors and Concentration Trends

4.4.2 PM₁₀

In 1987 EPA revised the 1971 standards in order to protect against adverse health effects of inhalable airborne particles that can be deposited in the lower (thoracic) regions of the human respiratory tract, with PM₁₀ as the indicator. EPA established identical primary and secondary PM₁₀ standards for two averaging times: 150µg/m³ (24-h average, with no more than one expected exceedance per year) and 50 µg/m³ (expected annual arithmetic mean, averaged over three years). These standards remained in effect until 2002, when the courts finally upheld the 1997 revisions put forth by EPA as a result of the mandated periodic scientific review. After the most recent scientific review on PM, EPA issued the final rule in December, 2006 revising the PM_{2.5} standards, at the same time revoking the PM₁₀ annual standard while retaining the 24 hr standard at 150µg/m³.

Wedding & Associates PM₁₀ Critical Flow High Volume Sampler (WED PM₁₀ sampler) were employed for the NYSDEC network. The quartz filters were collected and submitted to the Department of Health for laboratory analysis until 2005, when support services were terminated. Figure 4.7 shows the number of monitors and the composite annual arithmetic mean for PM₁₀. Starting in 2004, the R&P Partisol 2025 samplers were used for manual PM₁₀ collection by removing the PM_{2.5} size selective inlet. The filter cartridges are submitted to RTI (EPA contract laboratory) for mass analysis.

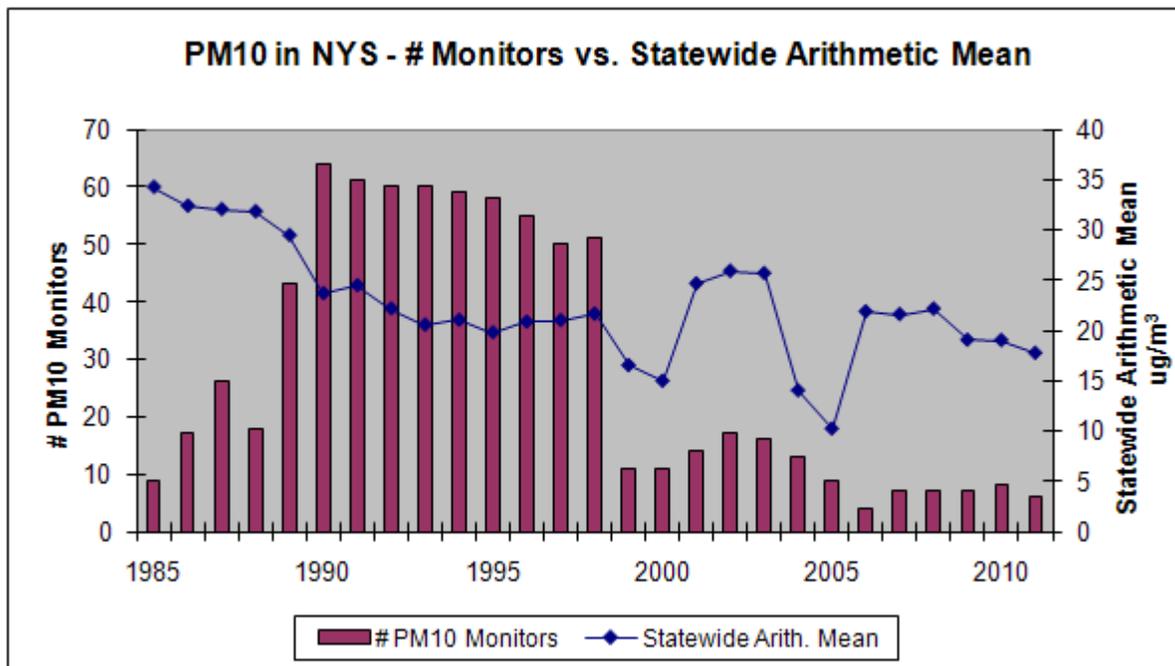


Figure 4.7 PM₁₀ Monitors and Concentration Trends

Currently there are five such sites in operation, as shown in Figure 4.8.

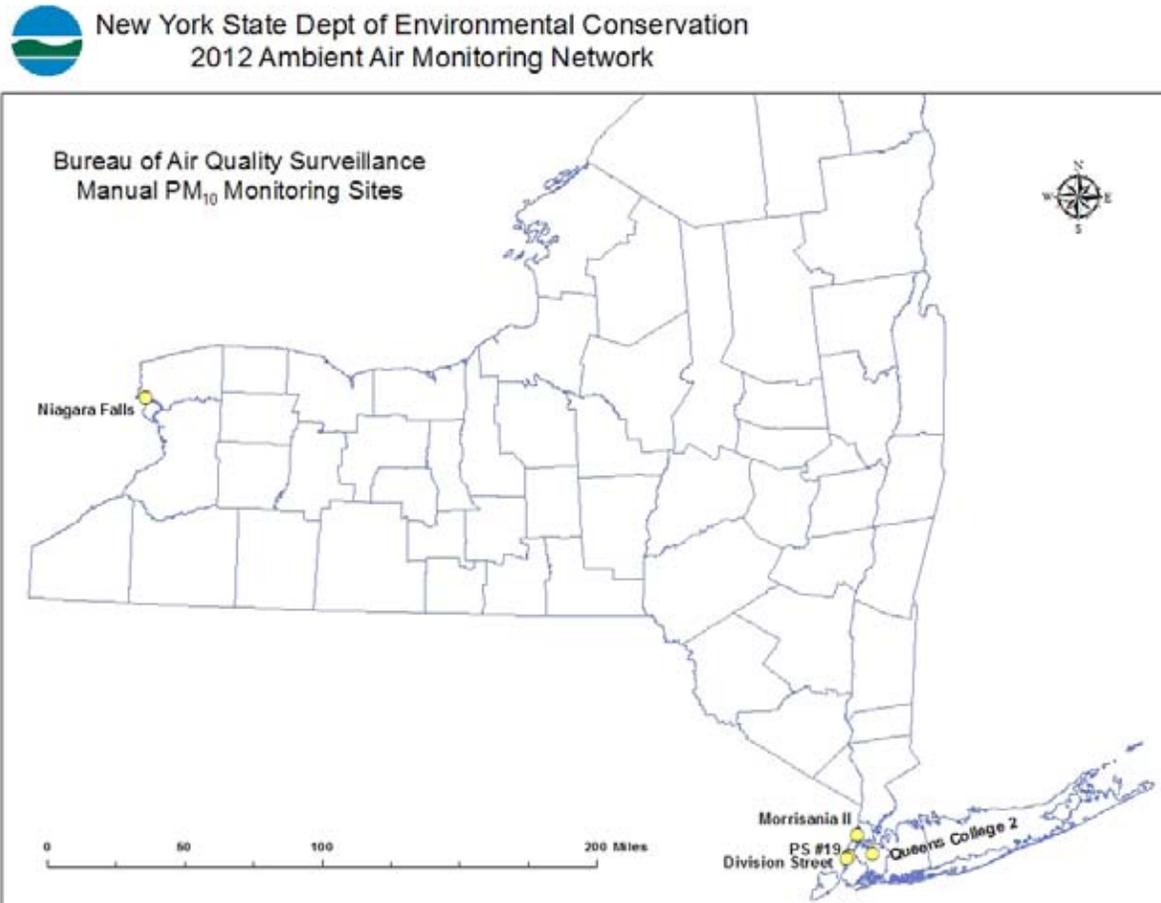


Figure 4.8 Location Map for PM₁₀ Monitoring Sites

A continuous PM₁₀ (TEOM) instrument is also operated at the NY Botanical Garden and Pinnacle State Park sites.

4.4.3 PM_{2.5}

In July 1997, EPA Administrator promulgated significant revisions to the PM NAAQS, after taking into account scientific information and assessments presented by staff, Clean Air Scientific Advisory Committee advice and recommendations, and public comments. While it was determined that the PM NAAQS should continue to focus on particles less than or equal to 10 μm in diameter, it was also determined that the fine and coarse fractions of PM₁₀ should be considered separately. New standards were added, using PM_{2.5} as the indicator for fine particles; and PM₁₀ standards were retained for the purpose of regulating coarse-fraction particles. Two

new PM_{2.5} standards were set: an annual standard of 15 µg/m³, based on the 3-year average of annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors; and a 24-h standard of 65 µg/m³, based on the 3-year average of the 98th percentile of 24-h PM_{2.5} concentrations at each population-oriented monitor within an area. To continue to address coarse-fraction particles, the annual PM₁₀ standard was retained, and the form, but not the level, of the 24-h PM₁₀ standard was revised to be based on the 99th percentile of 24-h PM₁₀ concentrations at each monitor in an area. The secondary standards were revised by making them identical in all respects to the PM_{2.5} and PM₁₀ primary standards.

After the most recent scientific review EPA issued the final rule in December, 2006 revising again the NAAQS for PM to provide increased protection of public health and welfare, respectively. EPA revised the level of the 24-hour PM_{2.5} standard from 65 to 35 micrograms per cubic meter (µg/m³) and retained the level of the annual PM_{2.5} standard at 15 µg/m³. With regard to PM₁₀, the 24-hour standard was retained, but the annual PM₁₀ standard was revoked.

The NYSDEC PM_{2.5} monitoring network deploys a combination of filter based Federal Reference Method (FRM) samplers, continuous mass monitors, filter based speciation samplers and continuous speciation samplers. The data from the FRM samplers are used to determine if the State's air quality meets the National Ambient Air Quality Standards (NAAQS). The continuous mass sampler data are used for the reporting of near real-time air quality data for health related warnings and forecasts. The speciation filter sampler data are used to determine the chemical constituents that make up PM_{2.5}. The continuous speciation data are used to examine the short term fluctuations in the concentrations of individual species or components that make up PM_{2.5}.

PM Monitoring Objectives

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 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 Code of Federal Regulations (CFR) to insure 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 is updated every hour for near real-time health related warnings, PM_{2.5} forecasts and updates as to current pollution concentrations.

The NYSDEC has attempted to adjust the PM_{2.5} network in light of EPA expectations, updated regulations and prioritized funding. The FRM network consisted of 40 sites when it was fully established using the original design criteria from 1998. Since then the number of sites have been reduced because fewer sites were required to determine compliance with the Annual PM_{2.5} NAAQS. The latest revisions to the Federal regulations have reduced the number of required monitors even further. These new requirements base the number of required monitors on

population and the expected $PM_{2.5}$ concentration. The NYSDEC network exceeds these requirements in all areas that are expected to be near or above either the Annual or Daily $PM_{2.5}$ standard.

The other monitoring objectives for the $PM_{2.5}$ network include transport and background monitoring. Transport monitoring sites are sites that are situated so that the data are representative of the air masses moving into the State from areas upwind. These sites are important because the sources of $PM_{2.5}$ that are outside of New York can contribute to New York's $PM_{2.5}$ ambient concentration. Background monitoring sites are sites that are representative of $PM_{2.5}$ concentrations that are generally not related to specific sources but impact wide areas. The concentrations measured at these background sites generally represent the lowest expected $PM_{2.5}$ concentrations in New York State.

Monitoring Scale and Representativeness

The geography of New York State encompasses a lake shore to the west, plateaus and rolling hills in the center, mountains to the northeast and south and sea shores to the southeast. All of these areas have varying population densities and meteorology. The populations living in these areas are exposed to $PM_{2.5}$ that is generated locally as well as from $PM_{2.5}$ that is transported from areas outside of their region.

The actual design of the network is a compromise that minimizes the number of monitoring locations while ensuring that the measured concentrations for each area are indicative of actual population exposures. Each sampler is assigned a scale or "zone of representativeness" when it is installed. The scale determines how large a geographical area the resulting data will represent. EPA has defined ambient monitoring scales as:

Microscale:	Represents (10 - 100 meters)
Middle Scale:	Represents (100 - 500 meters)
Neighborhood Scale:	Represents (500 meters - 4 km)
Urban Scale:	Represents (4 - 100 km)
Regional Scale:	Represents (100 to 1000 km)

The scale of the FRM monitoring sites that have population exposure as their objective is Neighborhood or Urban. The definitions of scale primarily serve to identify the site's sensitivity to individual sources. A monitoring site that is routinely impacted by a specific source has a much smaller "scale" than a site that only sees an effect from numerous widespread sources. The FRM sites in New York State are located in places that will likely have high concentrations and large monitoring scales. This ensures that the public is not exposed to higher ambient $PM_{2.5}$ concentrations than the concentrations from the FRM network reported for their area.

The $PM_{2.5}$ monitoring network works well for determining average ambient exposures for most of the State's population. The limitations of the network stem from the inability to monitor in

smaller scales such as Middle and Microscale. An example of an urban microscale influence not addressed by the network would be $PM_{2.5}$ emissions from traffic in a street canyon. Certainly if New York residents spent much of their time in this type of confined area, then their exposure to ambient $PM_{2.5}$ would be considerably higher than that indicated by the closest neighborhood or urban scale monitor. Similarly, a person in a rural valley area subject to daily woodsmoke would also be exposed to higher $PM_{2.5}$ concentrations than those measured at the nearest Neighborhood or Urban scale monitor.

The $PM_{2.5}$ ambient monitoring network is also not able to determine the population's overall exposure to $PM_{2.5}$. Personal habits such as smoking and occupations such as mining, farming and construction can lead to much higher exposures to $PM_{2.5}$ than that of the majority of the population. Other factors such as widely varying indoor $PM_{2.5}$ concentrations can lead to uncertainty in overall $PM_{2.5}$ exposures.

The locations of the $PM_{2.5}$ monitoring sites are selected to measure ambient concentrations in representative populated areas statewide, and thus are suitable for annual standards comparisons with the exception of two sites: Whiteface and Westfield. These sites are placed in sparsely populated locales for the purpose of background and regional transport determinations.

$PM_{2.5}$ Monitoring Instrumentation

The filter based FRM samplers used in New York are the Model 2025 sequential samplers made by the Thermo Environmental Company (Franklin, MA). The sampler has been designated by EPA as a reference method instrument for $PM_{2.5}$ particle collection. The designation is: RFPS-0498-118.

Currently there are 18 FRM monitors in operation statewide, as shown in Figure 4.9.

 New York State Dept of Environmental Conservation
2012 Ambient Air Monitoring Network

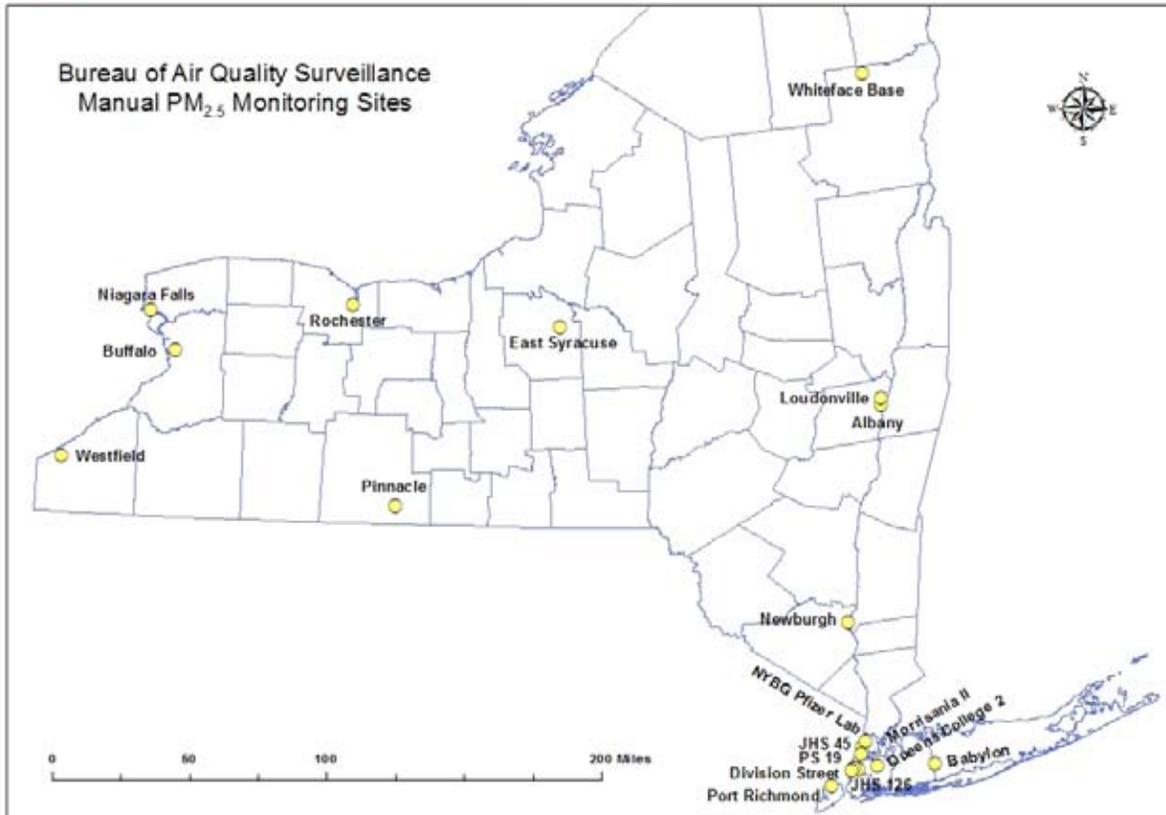


Figure 4.9 Site Location Map of Manual PM_{2.5} (FRM) Monitoring Network

Figure 4.10 below shows the number of manual PM_{2.5} monitoring sites and the composite annual arithmetic means in New York State since the network was implemented in 1998.

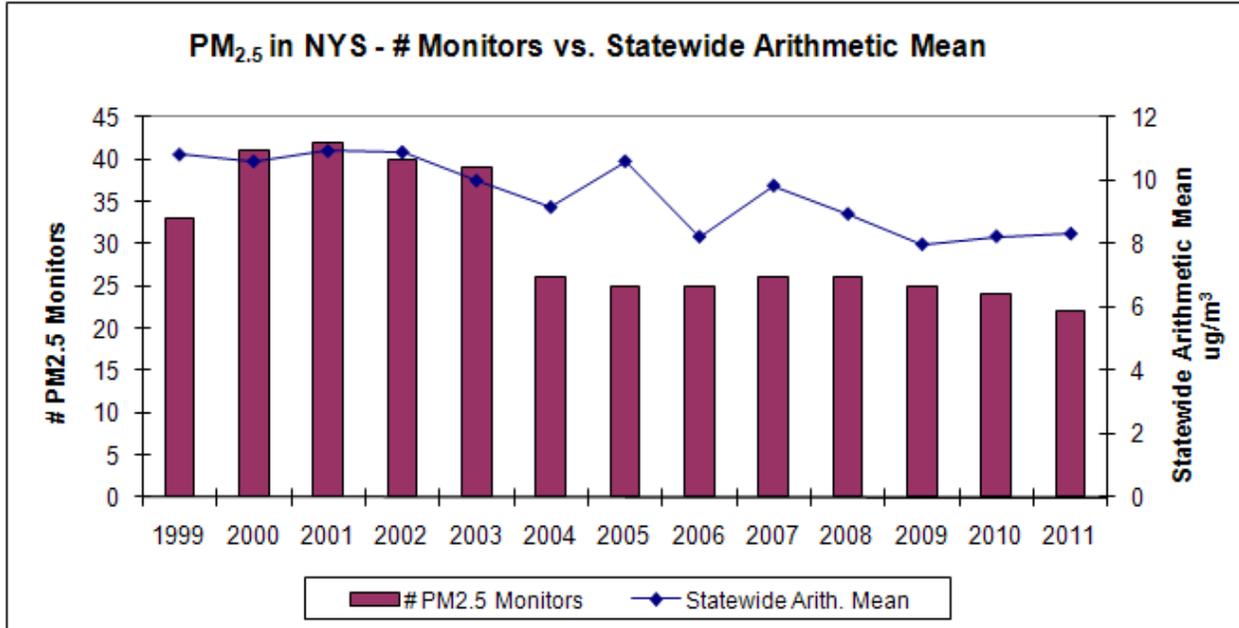


Figure 4.10 PM_{2.5} Monitors and Concentration Trends

The continuous mass monitoring instruments used in New York are the TEOM 1400ab also made by the Thermo Environmental Company. These instruments have received designation by EPA for PM₁₀ but not for PM_{2.5}. PM_{2.5} is more difficult to measure than PM₁₀ with automated samplers because PM_{2.5} contains a higher fraction of volatile components. The heated measurement sensor for the TEOM reduces the amount of volatile mass measured as compared to filter based FRMs. The NYSDEC utilizes non-linear data adjustments to make the TEOM data more comparable with the FRM data. The adjusted data are used for public reporting and forecasts of PM_{2.5} concentrations.

The NYSDEC uses eight MetOne SuperSass and URG 3000N samplers for the collection of samples for the speciation of PM_{2.5}. The samplers collect 3 and 1 filter samples respectively every third day or sixth day for a period of 24 hours. The samples are then sent to an EPA contract laboratory for chemical analysis. There are over fifty species consisting of ions, metals and carbon species quantified by the analyses.

4.4.4 Continuous PM Monitoring

Continuous mass monitoring is performed primarily with a network of TEOM 1400ab instruments. This element of the PM_{2.5} monitoring network provides the data used for public reporting purposes including; the NYSDEC website, the AIRNow website and for PM_{2.5} forecasting. The data from the TEOMs are polled and reported every hour to insure that the public has access to the most recent air quality information.

The TEOM data is compared to the filter based FRM data on an annual basis. The comparison allows the analysts to create non-linear correction factors that modify the TEOM data to more closely resemble FRM data. This is necessary because FRM data is not available for near real-time public reporting purposes. EPA has recently recognized the value of these data adjustments and has created new method codes so this adjusted data can be submitted to the AQS database. The NYSDEC now submits TEOM data from each site in its original unadjusted format as well as the adjusted data to match more closely with the FRM.

There are 28 continuous PM_{2.5} monitoring sites as shown in Figure 4.11.

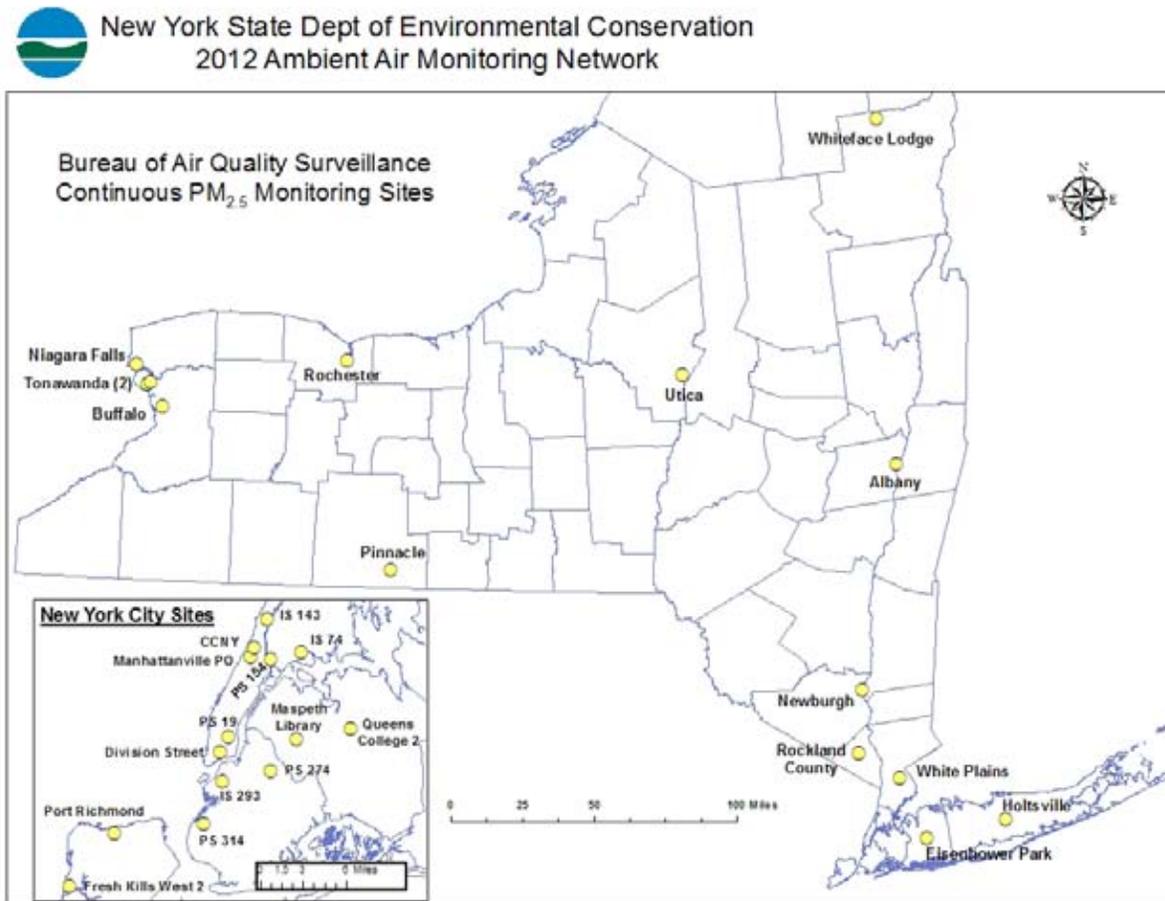


Figure 4.11 Site Location Map of Continuous PM_{2.5} (TEOM) Monitoring Network

The NYSDEC also operates some of the newest continuous mass monitors which have undergone Federal Equivalent Method (FEM) designation. These instruments collect more of the volatile PM mass that the filter based FRM may or may not retain depending on the environmental conditions during and after the period in which the filter sample was collected. The Department has been evaluating the technological improvements that have led to the current PM_{2.5} continuous FEMs for more than 10 years. The ThermoFisher Scientific 1405DF FEM performed better than the other instruments in on-site deployments at urban and rural locations in the state. The Department purchased several of these but they have not operated reliably and

have not produced data that compares acceptably with the FRM. The equipment manufacturer is aware of the issues and seems to be working towards resolutions of the problems. The Department will continue to rely on the FRM network to provide data for comparison with the ambient PM_{2.5} air quality standards.

4.4.5 Speciation

Speciation monitoring is performed with a network of eight MetOne SuperSass samplers. There are eight sites in New York State operating with the Speciation Trends Network (CSN) sampling protocol. Six operate on a 1/3 day schedule and two operate on a 1/6 day schedule. All of these sites host collocated FRM and continuous mass monitoring instruments. A rural and an urban site also host collocated IMPROVE protocol samplers. The data from these sites is used to assist in the comparison between CSN and IMPROVE data sets. The goal of the urban installation will be to further relate the mostly rural IMPROVE network to the mostly urban CSN network.

In order to address inconsistencies in carbon sampling and analysis procedures used in urban CSN/SLAMS and rural IMPROVE programs, EPA determined that the URG sampler would be used at all CSN sites. The conversion was completed 2008 for all of the NY sites.

Figure 4.12 shows the seven CSN sites currently in operation.

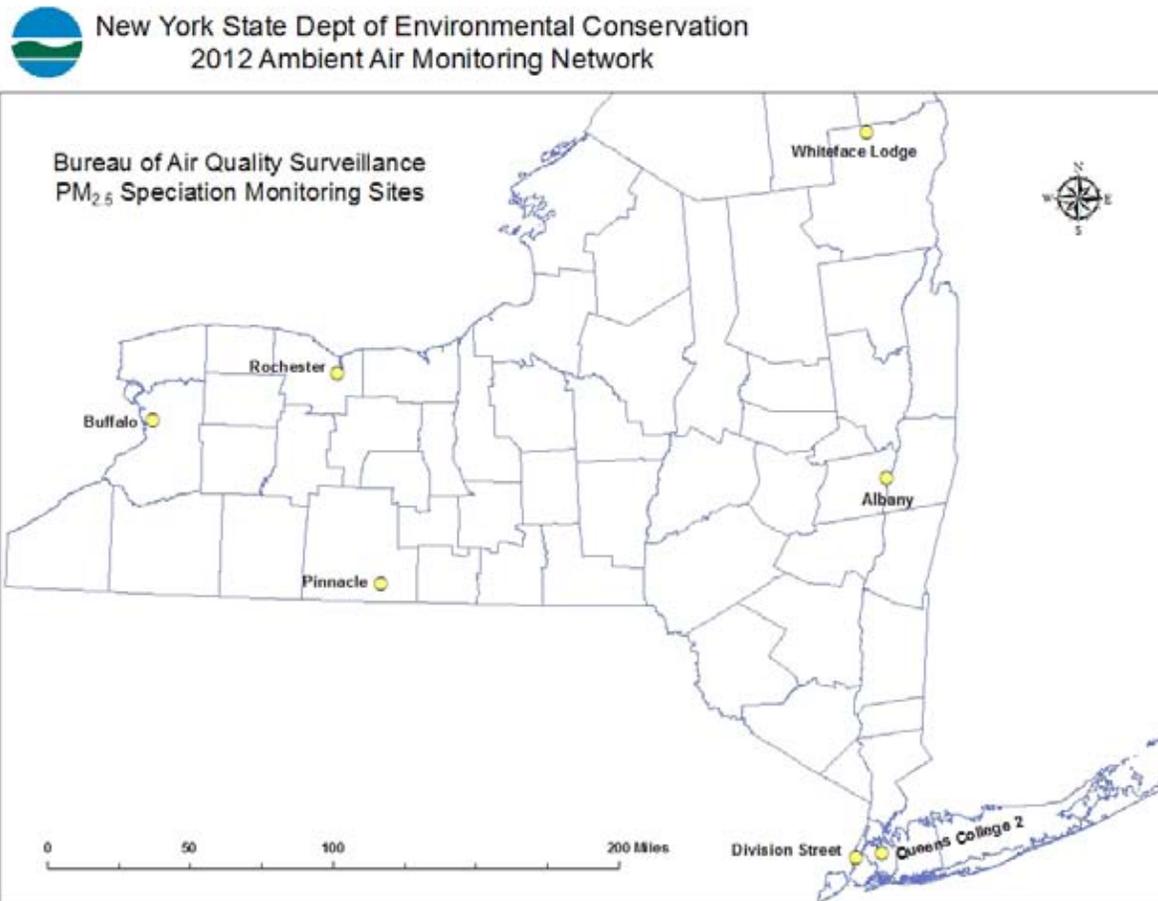


Figure 4.12 Location Map of Speciation Sampling Sites

4.4.6 Continuous Speciation

The NYSDEC recognizes the value of high temporal measurements (hourly or higher) of PM_{2.5} species. This data is useful for the examination of pollutant trends (and temporal patterns) and can provide information necessary for identification of pollutant sources. This is critically important for areas facing non-attainment for the PM_{2.5} NAAQS. Identifying seasonality of species is necessary to develop control strategies. Long term monitoring is vital to this effort because in addition to changes in source emissions, variations in meteorology also affect ambient pollutant concentrations (e.g. wetter than average conditions lead to a washout of pollutants and a lowering of ambient concentrations).

The NYSDEC continuous speciation program is expanding and currently includes monitoring at urban and rural locations. Sulfate, nitrate, organic carbon, elemental carbon and black carbon species data are collected at hourly or higher frequency. In this manner both the regional and

inter-urban variability of these species are being investigated. The NYSDEC uses instruments to examine the species of PM_{2.5} on a higher frequency than what is available from the filter based speciation sampling network. This continuous speciation data is useful in the examination of source strengths and the relationship between pollutant concentrations and meteorology. The operation of continuous speciation equipment is also less expensive than long term filter species measurements due to the high costs associated with filter lab analysis. Operation of continuous speciation in conjunction with 24-hr CSN sampling is beneficial in accounting for biases in measurements when a change to the CSN method occurs. This is demonstrated in the case of CSN carbon which was changed to the IMPROVE method in 2007. Long term collocated continuous carbon measurements prior to and following this change are being used to assess the bias between the old and the new carbon methods. This data will be important in determining the long term trends in PM_{2.5} carbon species.

NYSDEC has been using the continuous speciation data in NYC to examine temporal patterns such as diurnal and day of week patterns of aerosol species related to source strengths and meteorology. For example elemental carbon, black carbon and primary pollutant NO_x in NYC track throughout the day with peak concentrations in the morning coincident with the early commute period. Mobile emissions in the early morning occur into a shallow boundary layer which concentrates pollutants near ground level. An elevation in boundary layer height during the day leads to a dispersion of pollutants and a less pronounced afternoon/evening peak. Concentrations of these species are also higher on weekdays compared to weekends indicating that local mobile emissions are a significant source of these species. During winter months organic carbon sometimes shows similar patterns to EC and NO_x reflecting the primary organic component most likely from mobile emissions. Throughout the year however organic carbon does not track the primary pollutants but is more correlated with PM_{2.5} mass (and sulfate during summer months) indicating that there is a significant regional or non-local contribution to organic carbon measured in NYC. Our continuous speciation measurements also reveal temporal patterns in particle nitrate. In cooler months PM_{2.5} nitrate has a broader peak than EC which appears later in the morning, consistent with photochemical and secondary aerosol production. During the warm season nitrate concentrations are significantly lower and the late morning nitrate peak (observed in winter) is not observed in the warm season because as temperatures rise during the day aerosol nitrate reverts back to its precursors (nitric acid and ammonia).

Continuous data can also be used to capture the full extent of regional or local plumes that would normally be missed by the 24-hr filter sampling network. It allows us to study plume events and how meteorology can affect measurements. One can also differentiate between plumes which are short term of a few hours long (e.g. plumes from oil boiler emissions) likely driven by carbon versus those that are more regionally driven by sulfate in summer. High temporal pollutant data is also beneficial for public health effect studies that often require resolving confounding factors.

4.4.7 Additional Monitoring Initiatives

The NYSDEC has been active in additional research and monitoring beyond the mandated Federal requirements. Some of this work has been collaborative with goals ranging from

collecting data with the newest technologies, to providing support for health studies to evaluating new monitoring instruments. Other projects undertaken by the NYSDEC such as adding additional monitoring after the World Trade Center attack or monitoring before and after the cap was installed on the Fresh Kills landfill could not have been undertaken by other Agencies.

4.4.7.1 PM_{2.5} Technology Assessment and Characterization Study-New York Supersite

The largest collaborative monitoring project undertaken by the NYSDEC and State University of New York's Atmospheric Science Research Center (SUNYA-ASRC) was the Supersite program known as PMTACS. The 5 year monitoring initiative leveraged resources from EPA, NYSERDA and the NYS Environmental Bond Act to obtain detailed highly resolved pollutant measurements from NYC, Whiteface Mountain and an upwind rural site south-west of Corning, NY. This monitoring project also involved participants from the NYSDOH, Penn State University, Aerodyne Research Inc. and Clarkson University. The project's website lists many of the program details: <http://www.asrc.cestm.albany.edu/pmtacsny/index.html>

Some of the instrument method development work initiated under this program has continued after the conclusion of the PMTACS program. This shared effort includes method development work on trace gas monitors, continuous organic carbon monitors, continuous particulate sulfate instruments, continuous particulate nitrate and ammonia instruments. All of these instruments will be needed as NYSDEC designs PM control strategies for non-attainment areas within New York State.

The current research undertaken by this collaboration involves small particle and precursor gas concentration measurements from rural and urban locations in NY State. NYSERDA has provided funds for this work which includes an intensive monitoring campaign over several weeks this summer in New York City. The past summer measurements in conjunction with some on-going measurements are being used to compare with data taken at an urban NYSDEC monitor and those from a mobile van traveling on nearby highways. These studies will help to determine the impacts of mobile sources at fixed neighborhood monitors.

4.4.7.2 Organic Carbon: Molecular Marker Characterization

The NYSDEC collaborated with Rutgers, Drexel, NESCAUM, NJDEP and CTDEP on a project called the Speciation of Organics for Apportionment of PM_{2.5} in the New York City Area (SOAP). The field portion of the project was conducted from May 2002 to May 2003. It operated at four sites: Queens, NYC (high density urban residential); Elizabeth, NJ (adjacent to the NJ Turnpike); Westport, CT (downwind NYC); and a regional background site in Chester, NJ (upwind NYC). The study's chief objectives were to expand the chemical characterization of organic compounds and to estimate the source contributions of carbonaceous fine particles at urban and background monitoring sites.

This project continued at a site in NYC and a rural site in Addison, south-west of Corning, NY during 2005 to 2007. Sampling for this project has been completed. The data from this project will provide information about the significance of sources of organic carbon particulate in both

urban and rural areas in New York. This type of information will be used to assess the potential viability of local and wide range PM_{2.5} control strategies.

4.4.7.3 PM Coarse Monitoring

The NYSDEC is taking an active role in advance of an upcoming EPA directive to monitor for PM Coarse (PM₁₀ - PM_{2.5}). Filter based monitoring was initiated in NYC and in Niagara Falls to determine approximate concentrations of PM Coarse. This information may assist EPA Office of Research and Development (ORD) in their effort to develop robust automated sampling technologies. The NYSDEC has also used this data to comment on the proposed PM Coarse standard and network design that were recently part of the draft CFR Parts 53 and 58.

The NYSDEC has supported the development of automated near real-time PM instruments. The NYSDEC and the ThermoFisher Co. installed beta version automated PM Coarse instruments into an urban and a rural NYSDEC monitoring site. Data from the filter based samplers already operating at the site will be used to evaluate the new technology. The benefit of this work for the NYSDEC is that it is more likely that the new instrument when fully developed will work properly in the routine monitoring network.

4.4.8 Air Pollution and Environmental Conditions

4.4.8.1 NYC Micro-scale Street Canyon Monitoring

The NYSDEC responded to a request by EPA to install 2 street level monitors in an urban area in NYC. The areas are known as canyons due to the tall buildings on either side of the street. The PM₁₀ data collected at the one remaining site is used to evaluate the differences between data collected at very low elevations, close to high traffic roadways, and the monitors that are properly sited in the rest of the monitoring network. One of the sites is still operating and its data may be able to help support the next review of the PM NAAQS.

4.4.8.2 Rochester PM Center Clarkson, Univ. of Rochester Medical Center

The NYSDEC collaborates with researchers from the University of Rochester Medical Center and Clarkson University who have been awarded a second PM health research grant from EPA. Their work focuses on the pathways and effects from PM pollution on the cardiovascular system. The NYSDEC provides data and support for a fine particle classifying instrument at a monitoring location near the University of Rochester.

4.4.8.3 Air Pollution Microscopy

In addition to performing toxics and acid deposition laboratory analyses, BAQS Monitoring Support Section at the Rensselaer facility operates a variety of analytical microscopes for particle analysis. These instruments include: Smiths Detection Inc. IlluminatIR Fourier Transform microscope; JEOL 6490LV Scanning Electron Microscope (SEM) with a Bruker Spirit Energy Dispersive Spectroscopy (EDS) System. Together with optical microscopes, staff can provide data on size, morphology, elemental, chemical, and other physical properties of particulate

samples of size down to 1 μm in diameter. The information obtained is valuable for the understanding of source origin and provides important input for apportionment analysis.

Ultra fine particles ($<0.1 \mu\text{m}$), primarily generated from combustion processes, including stationary fossil-fuel electric power generation, industrial processes, boilers, and gasoline and diesel engines, are an important component of $\text{PM}_{2.5}$. Scientists are becoming increasingly more interested in these ultra fine or "Nano" size particles. Recently NYSDEC acquired a VEECO Nanoscope Multimode Atomic Force Microscope (AFM) for the analysis of these extremely small particles. With the addition of this new instrument, we are now able to look at particulate an order of magnitude smaller than what the Scanning Electron Microscope ($300,000\times$ mag vs. $3,000,000\times$ mag) can provide. Whereas the SEM specializes in particles in the 2.5 micron range, the Nanoscope is currently analyzing particles in the 25-50 nanometer range. Particle size, surface texture and roughness are now available on such particles as diesel exhaust, wood smoke, and other products of combustion.

Recently NYSDEC acquired the Olympus LEXT Laser Confocal Microscope (LCM). It is designed to obtain images of ultrafine particles at ranges smaller than what can be seen with our Scanning Electron Microscope (SEM) and larger than what we can see with Atomic Force Microscope (AFM). It is the perfect fit between these two pieces of instrumentation and will complement both the AFM and SEM. Each method can "see" in the size range that the other cannot. The LCM works on particles between 500 nm and 200 microns, so it works in between the two.

The intended use of this instrument will provide information:

- on the use of alternative fuels such as biodiesel and ethanol, as well as their use with different emission after-treatment strategies. Little to no information is currently available on the effect of such fuels on particle morphology.
- to refine our methodologies for acquiring filter samples for microscopic examination and in performing these examinations. Future samples could potentially be taken both from direct mobile source emissions and also from ambient samplers deployed in the monitoring network.
- to re-evaluate our earlier ultrafine particle measurements. For example, earlier results suggest the presence of a secondary small particle mode in biodiesel emissions (smaller particles pose greater risks of health effects). Microscopic examination could provide evidence to either support or dismiss this finding.

4.4.8.4 Ultrafine Particulate Monitoring

NYSDEC first began ultrafine particulate monitoring with the deployment of a TSI Model 3031 Ultrafine Particle Monitor (UPM) at Queens College in June of 2009. This instrument provides continuous measurements of size distribution and particle number concentrations of fine particles below 1 micron, in the range from 20 to 500 nanometers. The Queens College NCore site was selected for the UPM so as to complement a suite of parameters already being measured there. Concurrently a demo UPM unit on loan for one year from the manufacturer was installed at the

Eisenhower Park location in Nassau County, which is expected to have a significant impact from mobile sources. Preliminary data suggest that the ultrafine particles are to a large extent regional in nature and less impacted by local mobile sources. The particle counts and size distributions for the two sites are similar, and also track the $PM_{2.5}$ profile in some cases. It is possible that the mobile signal is damped out due to the siting of the monitor, as the inlet probe height may not be optimal and there may be interference from nearby trees. In addition, a resource recovery facility located about ¼ mile west of the site, as well as other local sources (wood-fired pizza ovens, etc.) may influence the measurements. Alternate explanations may be that mobile ultrafine emissions are predominantly smaller than the 20 nanometer cut-off point or affect the measurements only on a short time scale. Data on particle size distribution and concentration will provide valuable information for the understanding of $PM_{2.5}$ formation mechanisms, as well as source apportionment determination.

It appears worthwhile to conduct short duration intensive studies in the future that simultaneously employ a suite of particle counting instruments including the Scanning Mobility Particle Sizer (SMPS), Fast Mobility Particle Sizer (FMPS), Condensation Particle Counter (CPC), and our UPM to further evaluate the mobile component. The new NO_x rule requiring the establishment of near-roadway monitors in populated areas starting in 2013 (see below) will afford an opportunity to collocate UPMs to further investigate the mobile contribution to the overall ultrafine concentration. The recent establishment of initial regulations intended to address ultrafine particle emissions from mobile sources (LEV-3 in California, Euro V-VII in the EU) is an early indicator of more extensive regulation of ultrafine particle emissions from mobile sources expected in the future, and suggests the potential emergence of regulations for ambient ultrafine particles as well.

In our Air Pollution Microscopy laboratory, three particle characterization techniques (Laser Scanning Confocal Microscopy, Scanning Electron Microscopy, and Atomic Force Microscopy) are used to investigate the morphology of real world ultrafine particles, such as those from mobile source emissions and other industrial sources. As an example, the changes in ultrafine particle morphology resulting from the use of two strategies for reducing diesel emissions, i.e., exhaust after-treatment and the use of alternative diesel fuels were studied. These activities complement the ambient monitoring data in understanding the formation, distribution and transport of ultrafine particulate.

4.5 Sulfur Dioxide

Sulfur dioxide (SO_2), a colorless, reactive gas, is produced during the burning of sulfur-containing fuels such as coal and oil, during metal smelting, and by other industrial processes. It belongs to a family of gases called sulfur oxides (SO_x). Major sources include power plants, industrial boilers, petroleum refineries, smelters, iron and steel mills. Generally, the highest concentrations of sulfur dioxide are found near large fuel combustion sources.

High concentrations of SO_2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated

SO₂ levels while at moderate exertion may result in reduced lung function that may be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO₂, in conjunction with high levels of PM, include respiratory illness, alterations in the lungs' defenses, and aggravation of existing cardiovascular disease. The subgroups of the population that may be affected under these conditions include individuals with cardiovascular disease or chronic lung disease, as well as children and the elderly.

Additionally, there are a variety of environmental concerns associated with high concentrations of SO₂. Because SO₂, along with NO_x, is a major precursor to acidic deposition (acid rain), it contributes to the acidification of soils, lakes, and streams and the associated adverse impacts on ecosystems. Sulfur dioxide exposure to vegetation can increase foliar injury, decrease plant growth and yield, and decrease the number and variety of plant species in a given community. Sulfur dioxide also is a major precursor to PM_{2.5} (aerosols), which is of significant concern to human health, as well as a main pollutant that impairs visibility. Finally, SO₂ can accelerate the corrosion of natural and man-made materials (e.g., concrete and limestone) that are used in buildings and monuments, as well as paper, iron-containing metals, zinc, and other protective coatings.

Figure 4.13 shows the number of SO₂ monitors and the composite annual means in New York State over the years.

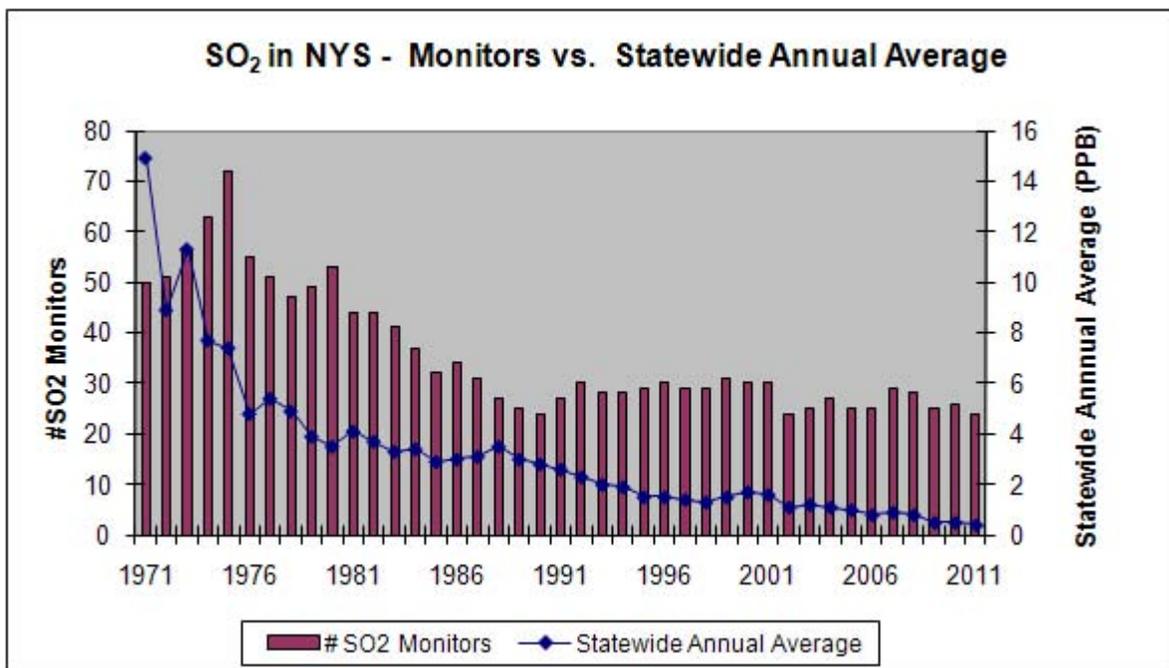


Figure 4.13 Sulfur Dioxide Monitors and Concentration Trends

Based on its most review of the air quality criteria for oxides of sulfur and the primary national ambient air quality standard (NAAQS) for oxides of sulfur as measured by sulfur dioxide (SO₂),

EPA replaced the existing 24-hour and annual standards with a new short-term standard based on the 3-year average of the 99th percentile of the yearly distribution of 1-hour daily maximum SO₂ concentrations. EPA set the level of this new standard at 75 ppb, which became effective August 23, 2010. EPA is also establishing requirements for an SO₂ monitoring network. These new provisions require monitors in areas where there is an increased coincidence of population and SO₂ emissions. In order to do this, EPA developed a Population Weighted Emissions Index (PWEI) that uses population and emissions inventory data at the CBSA level to assign required monitoring for a given CBSA (with population and emissions being obvious relevant factors in prioritizing numbers of required monitors). The PWEI for a particular CBSA was proposed to be calculated by multiplying the population (using the latest Census Bureau estimates) of a CBSA by the total amount of SO₂ emissions in that CBSA. The CBSA SO₂ emission value would be in tons per year, and calculated by aggregating the county level emissions for each county in a CBSA. The PWEI values are being developed using the 2010 Census numbers. The final network design requires that any SO₂ monitors required in a particular CBSA as determined based on PWEI values shall satisfy the minimum monitoring requirements if they are sited at locations where they can meet any one or more of the monitoring objectives: Source-Oriented Monitoring, Highest Concentration, Population Exposure, General Background, and Regional Transport. EPA is expected to provide additional guidance for the implementation of this rule.

There are 23 SO₂ monitors in operation currently, as shown in Figure 4.14. TEI Model 43C instruments using the pulsed fluorescence method are deployed in the network.

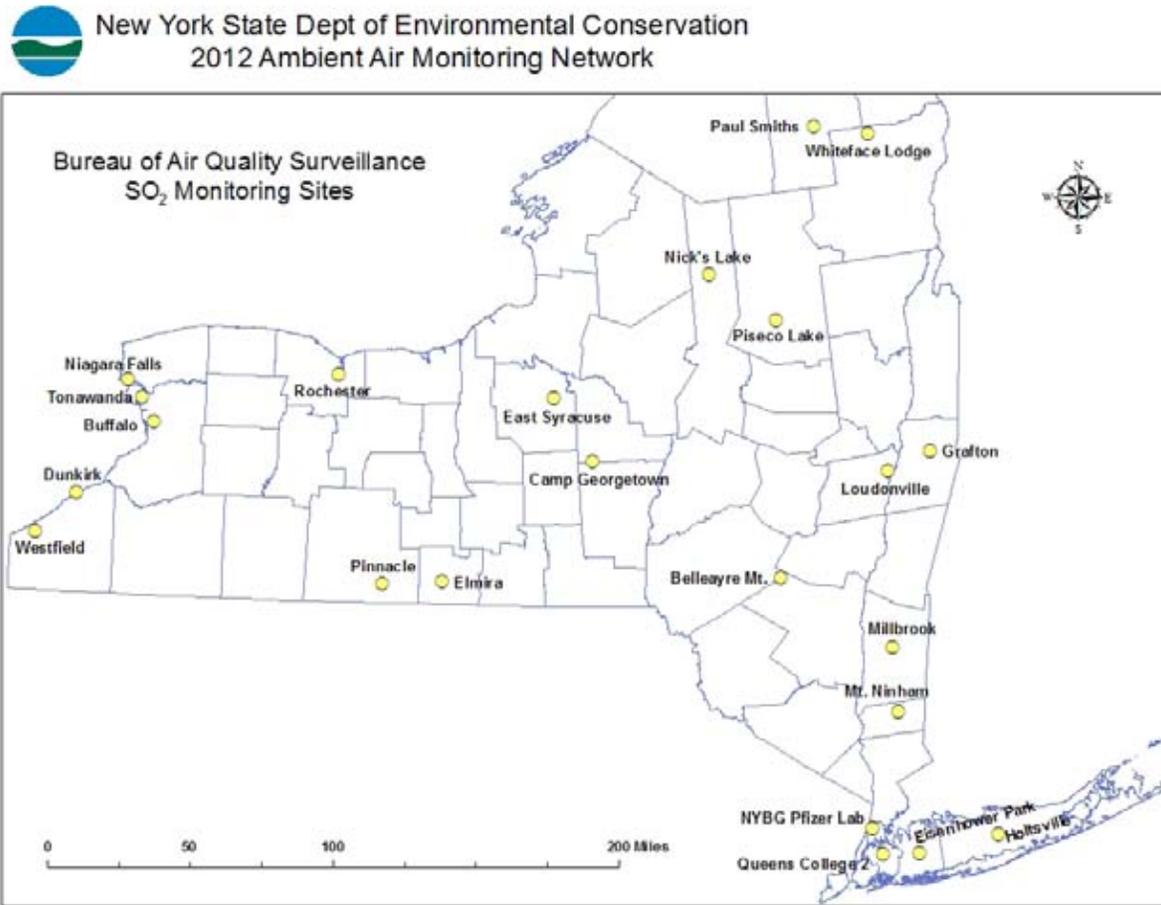


Figure 4.14 Location Map for Sulfur Dioxide Monitoring Sites

4.6 Ozone

Ozone is a molecule made up of three oxygen atoms (O_3), a very reactive gas, and even at low concentrations it is irritating and toxic. It occurs naturally in small amounts in the earth's upper atmosphere, and in the air of the lower atmosphere after a lightning storm. In the stratosphere, between 10km and 50km above the earth's surface it forms the Ozone Layer. This is an important protective layer which filters out most of the high energy ultra-violet radiation from the sun which would damage much of the life on earth. When ozone is present at ground level and in the troposphere (10-18 km above earth's surface) it is considered a pollutant and a greenhouse gas. Ozone is used both industrially and commercially due mainly to its reactivity. It is used as a clean way of purifying water both in industry and in the home in hot-tubs and fish tanks. It is also used to disinfect laundry both in hospitals and in the home.

Ground-level O_3 remains a pervasive pollution problem in the United States. Ozone is readily formed in the atmosphere by the reaction of volatile organic compounds (VOCs) and NO_x in the presence of heat and sunlight, which are most abundant in the summer. VOCs are emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products, other industries, and natural (biogenic) sources. Nitrogen oxides (a precursor to ozone) are emitted from motor vehicles, power plants, and other sources of combustion, as well as natural sources including lightning and biological processes in soil. Changing weather patterns contribute to yearly differences in O_3 concentrations. Ozone and the precursor pollutants that cause O_3 also can be transported into an area from pollution sources located hundreds of miles upwind.

Ozone occurs naturally in the stratosphere and provides a protective layer high above the earth. However, at ground level, it is the prime ingredient of smog. Short-term (1- to 3-hour) and prolonged (6- to 8-hour) exposures to ambient O_3 concentrations have been linked to a number of health effects of concern. For example, increased hospital admissions and emergency room visits for respiratory causes have been associated with ambient O_3 exposures.

Exposures to O_3 result in lung inflammation, aggravate preexisting respiratory diseases such as asthma, and may make people more susceptible to respiratory infection. Other health effects attributed to short-term and prolonged exposures to O_3 , generally while individuals are engaged in moderate or heavy exertion, include significant decreases in lung function and increased respiratory symptoms such as chest pain and cough. Children active outdoors during the summer when O_3 levels are at their highest are most at risk of experiencing such effects. Other at-risk groups include adults who are active outdoors, such as outdoor workers, and individuals with preexisting respiratory disorders such as asthma and chronic obstructive lung disease. Within each of these groups are individuals who are unusually sensitive to O_3 . In addition, repeated long-term exposure to O_3 presents the possibility of irreversible changes in the lungs, which could lead to premature aging of the lungs and/or chronic respiratory illnesses.

Ozone also affects sensitive vegetation and ecosystems. Specifically, O_3 can lead to reductions in agricultural and commercial forest yields, reduced survivability of sensitive tree seedlings, and increased plant susceptibility to disease, pests, and other environmental stresses such as harsh weather. In long-lived species, these effects may become evident only after several years or even

decades. As these species are out-competed by others, long-term effects on forest ecosystems and habitat quality for wildlife and endangered species become evident. Furthermore, O₃ injury to the foliage of trees and other plants can decrease the aesthetic value of ornamental species as well as the natural beauty of our national parks and recreation areas.

EPA initially established primary and secondary NAAQS for photochemical oxidants on April 30, 1971. Both primary and secondary standards were set at an hourly average of 0.08 parts per million (ppm), total photochemical oxidants, not to be exceeded more than one hour per year.

On February 8, 1979, EPA completed its first periodic review of the criteria and standards for O₃ and other photochemical oxidants and made significant revisions to the original standard: the level of the primary and secondary NAAQS was changed to 0.12 ppm; the indicator was changed to O₃; and the form of the standards was changed to be based on the expected number of days per calendar year with a maximum hourly average concentration above 0.12 ppm (i.e., attainment of the standard occurs when that number is equal to or less than one).

In July, 1997 EPA revised the primary and secondary O₃ standards on the basis of the then latest scientific evidence linking exposures to ambient O₃ to adverse health and welfare effects at levels allowed by the 1-hr average standards. The O₃ standards were revised by replacing the existing primary 1-hr average standard with an 8-hr average O₃ standard set at a level of 0.08 ppm. The form of the primary standard was changed to the annual fourth-highest daily maximum 8-hr average concentration, averaged over three years. The secondary O₃ standard was changed by making it identical in all respects to the revised primary standard. These standards were challenged in the courts and the litigation lasted until March, 2002 when the D.C. Circuit Court issued its final decision, finding the 1997 O₃ NAAQS to be “neither arbitrary nor capricious,” and denying the remaining petitions for review. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas (none in NY).

After the most recent review of the ozone NAAQS, EPA revised the 8 hr ozone standard (primary and secondary) to 0.075 ppm, which went into effect on May 27, 2008, at which time the 1-hr standard was revoked.

The number of ozone monitors and concentration trends for both the 1 hr, and 8 hr standards in New York State for the past three decades are shown in Figures 4.15 and 4.16, respectively.

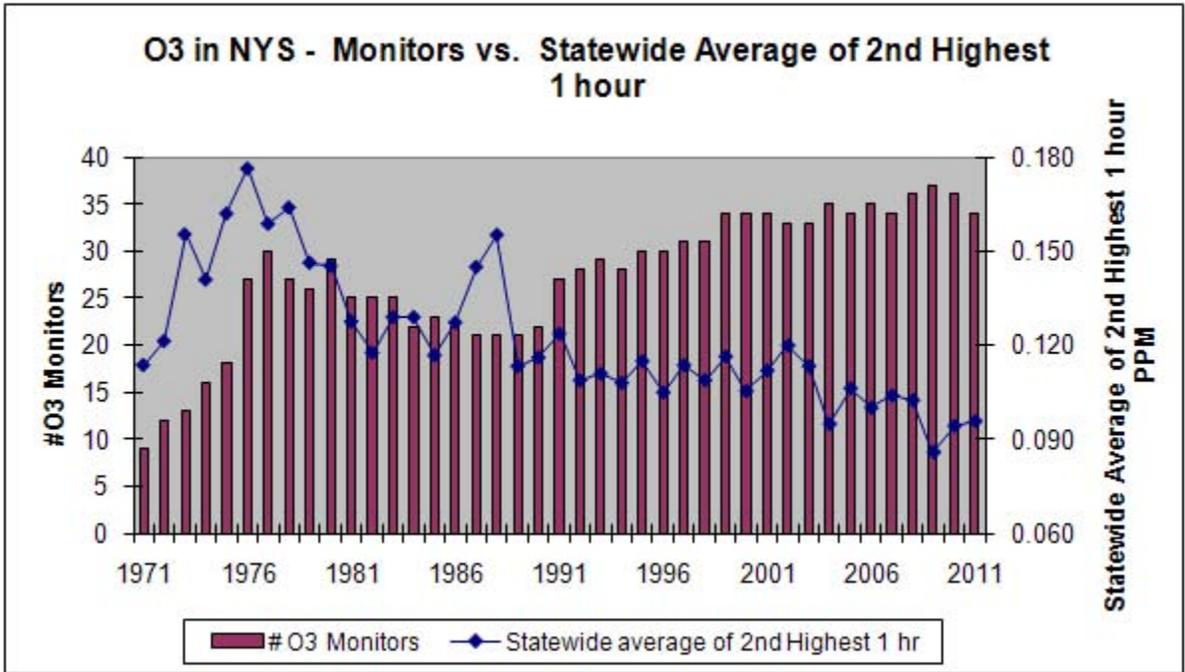


Figure 4.15 Ozone Monitors and 1 hr Concentration Trends

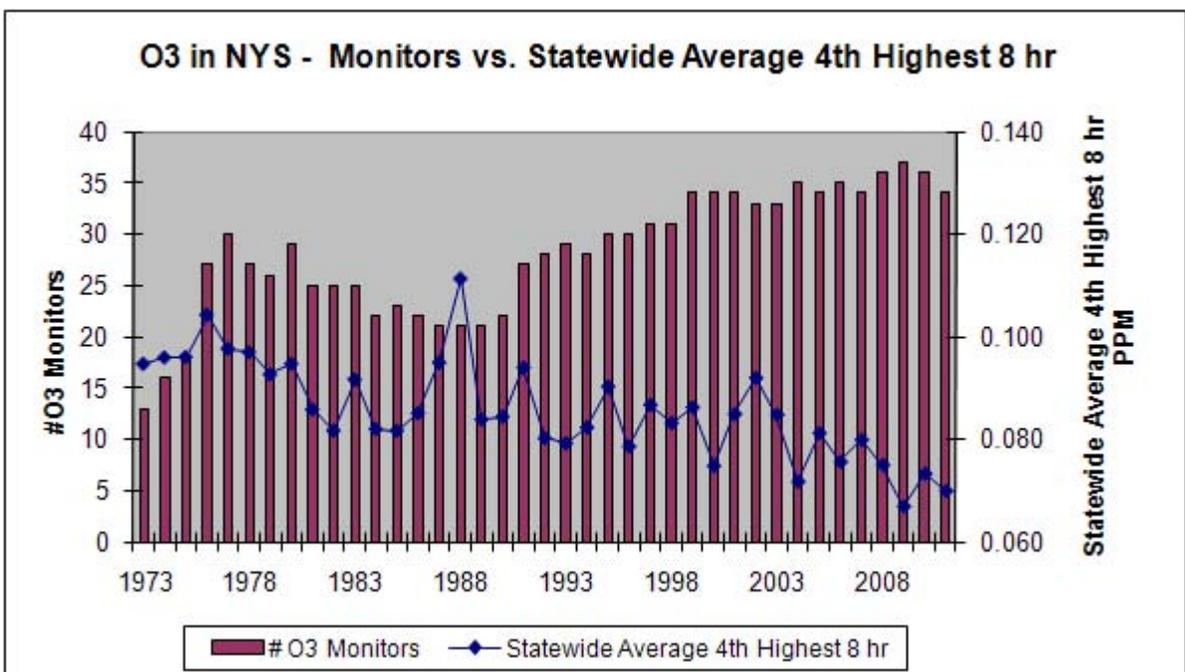


Figure 4.16 Ozone Monitors and 8 hr Concentration Trends

At present NYSDEC operates 33 TEI Model 49C ozone monitors statewide, which use the UV photometric method for detection. The site locations are depicted in Figure 4.17 below.

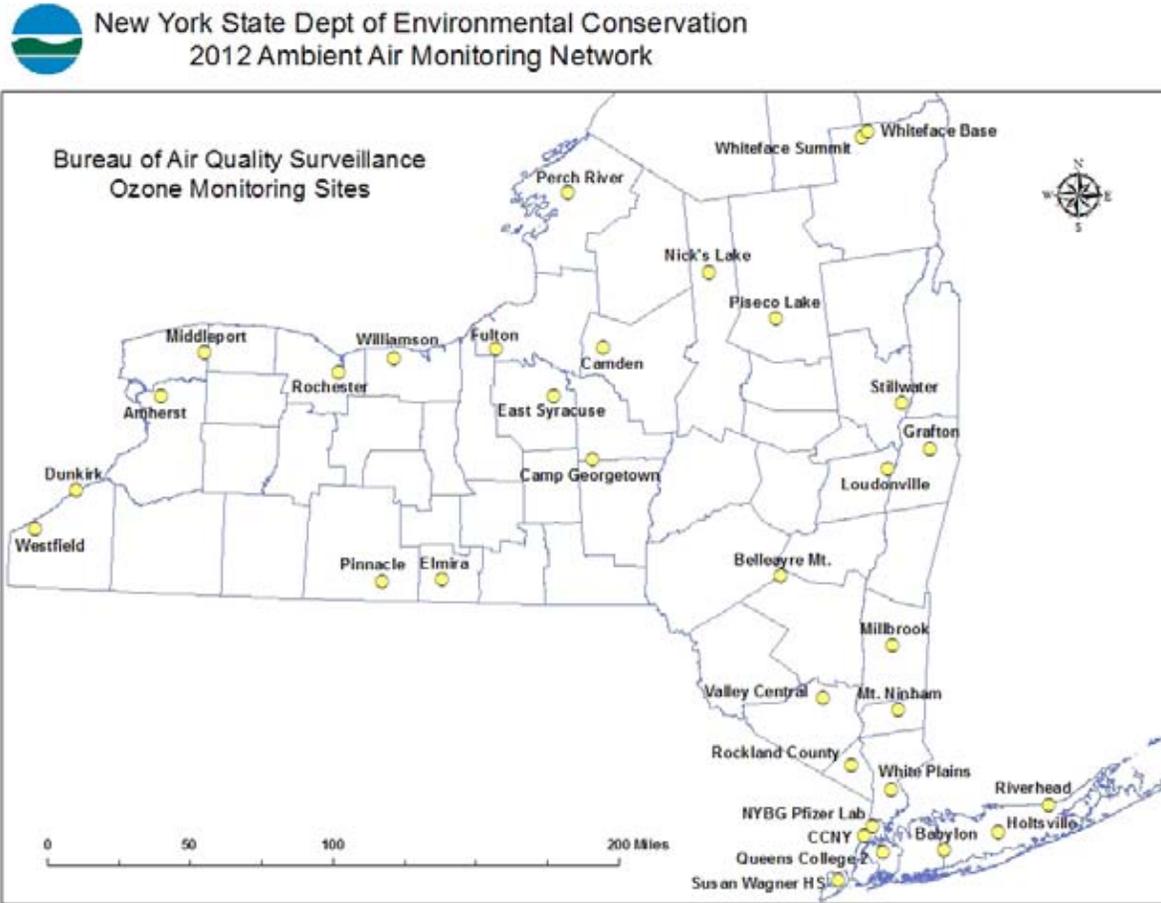


Figure 4.17 Location Map for Ozone Monitoring Sites

5. EPA's National Toxics Program

In general, EPA plans to use ambient air toxics monitoring to support the air toxics program's efforts to reduce human exposure and health risks from air toxics. The monitoring data provided by the ambient air toxics monitoring program is intended to support four major objectives:

- Establish trends and evaluate the effectiveness of air toxics emissions reduction strategies.
- Characterize ambient concentrations (and deposition) in local areas. Air toxics originate from local sources and can concentrate in relatively small geographical areas, producing the greatest risks to human health.
- Provide data to support, evaluate, and improve air quality models. Air quality models are used to develop emission control strategies, perform exposure assessments, and assess program effectiveness.
- Provide data to support scientific studies to better understand the relationship between ambient air toxics concentrations, human exposure, and health effects from these exposures.

EPA's national air toxics monitoring program is comprised of four different monitoring efforts:

- National Air Toxics Trends Stations (NATTS)
- EPA funded local-scale projects to assess conditions at the local level
- Existing State and local program monitoring
- Persistent bio-accumulative toxics monitoring

The objective for the NATTS network is to provide long-term monitoring data for certain priority air toxics across representative areas of the country in order to establish overall trends for these pollutants. Currently there are 23 NATTS established in 22 cities. The two New York NATTS sites are located in the Bronx, and Rochester, respectively.

EPA's initial ambient air toxics monitoring pilot studies disclosed that significant variations in pollutant concentrations occurred across a city and that these variations cannot be characterized by a single monitoring site. As a result, EPA decided that local-scale projects consisting of several monitors operated for a period of 1 to 2 years should be incorporated into the national air toxics monitoring strategy. In 2006 New York was awarded a grant for a community air quality air study in Tonawanda which began in July 2007. Hazardous air pollutants (HAPs) and fine particulate matter are measured at 4 locations in the Tonawanda community to address citizen concerns. The field sampling portion of this study was completed in July, 2008.

New York State has been operating a toxics monitoring network since 1990, funded entirely by State monies. Currently there are 11 sites statewide collecting 24 hr canister samples for VOC analysis in a 1 in 6 days interval. See section on NY Toxics Monitoring Network. The monitoring program for persistent bio-accumulative toxics primarily consists of deposition monitoring, not ambient air monitoring. Several monitoring programs operated by various Federal agencies have been established to measure the presence of toxics in various media. In

2010 New York completed an EPA funded community grant study titled “New York State Ambient Mercury Baseline Study” for the measurement of speciated mercury in ambient air, as well as mercury in wet deposition. Instruments at the two study sites are still operating with other funding sources and additional funding is being sought to continue this important monitoring.

In addition to air toxic-specific monitoring activities, several other monitoring programs that are primarily intended to address other air pollution concerns incorporate some aspects of air toxics monitoring. For example, the Photochemical Assessment Monitoring Stations (PAMS) collect data on certain volatile organic compound and carbonyl air toxics. Further, the results of some particulate matter monitoring is speciated (i.e., the individual compounds comprising the particulate matter are analyzed) to identify certain air toxics compounds.

5.1 National Air Toxics Trends Stations (NATTS)

EPA’s Urban Air Toxics Program identified 33 high-priority urban air toxics. From these 33 air toxics EPA developed a list of 19 “core” air toxics representing the pollutants for which EPA eventually wants to develop trends information. However, because of limitations in available methodologies, EPA decided that at a minimum, in starting the network, each of the NATTS should monitor for at least 6 of these 19 pollutants. These six pollutants are considered national air toxics “drivers” (i.e., pollutants of concern in all areas of the country).

Table 5.1 NATTS Pollutants of Concern

Required Monitoring	Desired Monitoring
1,3-butadiene	trichloroethylene
acrolein	tetrachloroethylene
arsenic	beryllium
formaldehyde	nickel
benzene	cadmium
hexavalent chromium	acetaldehyde
	1,2-dichloropropene
	carbon tetrachloride
	lead
	chloroform
	manganese
	methylene chloride
	vinyl chloride

For the two NATTS sites, New York will perform analysis of 42 VOCs (Table 5.2), and 12 carbonyls (Table 5.6). More details on the sampling and analysis are provided in the NY Toxics Monitoring, and Photochemical Assessment Monitoring Stations sections, respectively. In addition, low volume PM₁₀ teflon filters are collected for trace metals analysis using ICP-MS.

The targeted metals include: arsenic, beryllium, cadmium, lead, manganese, nickel, antimony, cobalt, and selenium, with the last three being potential future HAPs. Hexavalent chromium sampling commenced in November 2007 at the Rochester and Bronx sites. The cellulose filter samples are shipped to EPA/ERG for laboratory analysis.

Polycyclic Aromatic Hydrocarbons (PAHs) sampling at the Rochester and IS 52 sites began in July, 2008. The collection media consists of one 110 mm diameter glass microfiber filter and a tubular glass cartridge containing a combination of Polyurethane Foam (PUF) and XAD-2 resin. The exposed samples are shipped to an EPA contract laboratory (ERG) for analysis.

Due to roof construction work at IS 52, sampling for NATTS parameters was temporarily moved to the Morrisania site, 1.7 miles NW of the original location beginning in mid June, 2010. The relocation interrupted some sample collection. The EPA was notified of the temporary relocation prior to the move and the data will be submitted using the AQS code for the Morrisania site: 36-005-0080. It is anticipated that the construction work at IS 52 will be completed by summer, 2012, at which time the site will be re-established.

5.2 NY Toxics Monitoring Network

The NY ambient air toxics monitoring program was first established in 1985 as part of the Governor's Air Monitoring Modernization Capital Budget Program. This monitoring network measures Volatile Organic Compounds (VOCs) across the State. The initial development of the network and analytical capabilities was part of a joint Staten Island/New Jersey Urban Air Toxics Assessment Project (SI/NJ Study) coordinated with U.S. EPA Region II from 1987 through 1989. The network expanded in 1990 to a statewide network.

The goal is to monitor air quality related to toxics in the State's urban, industrial, residential, and rural areas. Implementation of this program starts the development of a long-term toxics air quality database for New York State. The database will be used to define, attain, and preserve good air quality in New York State. The data defines actual air quality impacts of the VOCs. The data is used in the design and management of New York's air quality, including risk assessment, modeling, planning and trend analysis.

Initially only seventeen VOCs were monitored until 1995, when the number of analytes was increased to nineteen. In 2002 the list of VOCs was expanded to include 42 compounds as shown in Table 5.2 below:

Table 5.2 Target List of Volatile Organic Compounds

CHEMICAL	CAS #
Methylene Chloride	75-09-2
Chloroform	67-66-3
1,2 Dichloroethane	107-06-2
1,1,1 Trichloroethane	71-55-6
Carbon Tetrachloride	56-23-5

CHEMICAL	CAS #
Trichloroethylene	79-01-6
1,1,2 Trichloroethane	79-00-5
Tetrachloroethylene	127-18-4
Acrolein	107-02-8
Benzene	71-43-2
Toluene	108-88-3
Ethylbenzene	100-41-4
M,P-Xylene	1330-20-7
O-Xylene	95-47-6
Chlorobenzene	108-90-7
1,2 Dichlorobenzene	95-50-1
1,3 Dichlorobenzene	541-73-1
1,4 Dichlorobenzene	106-46-7
Vinyl Chloride	75-01-4
1,2 Dichloropropane	78-87-5
1,2,4-Trimethylbenzene	95-63-6
1,3,5-Trimethylbenzene	108-67-8
1,1-Dichloroethylene	75-35-4
Hexachloro-1,3-Butadiene	87-68-3
1,1-Dichloroethane	75-34-3
Chloromethane	74-87-3
Chloroethane	75-00-3
cis 1,2-Dichloroethylene	156-59-2
cis 1,3-Dichloropropene	542-75-6
trans 1,3-Dichloropropene	542-75-6
Dichlorodifluoromethane	75-71-8
Trichlorofluoromethane	75-69-4
Trichlorotrifluoroethane	76-13-1
Dichlorotetrafluoroethane	76-14-2
1,2-Dibromoethane	106-93-4
A-chlorotoluene (Benzylchloride)	100-44-7
1,1,2,2 Tetrachloroethane	79-34-5
Bromomethane	74-83-9
Styrene	100-42-5
Bromodichloromethane	75-27-4
1,3 Butadiene	106-99-0
Methyl Tert Butyl Ether	1634-04-4
1,2,4 Trichlorobenzene	120-82-1

Volatile organic compounds are collected in stainless steel canisters contained in a sampler known as an ambient air canister sampler. The sampler is an air flow calibrated sampling device that pumps ambient air into the canister. A special stainless steel diaphragm pump provides a constant pressure to push the sample through the sampler. A relief valve is used to maintain a

steady pressure for the sample flow controller. Samples are collected at a one in six days frequency and shipped back to the Rensselaer laboratory facility for analysis.

The analysis methodology is a modified version of EPA method TO-15. An aliquot of air sample is taken from the canister at a controlled flow and temperature onto an Entech Model 7100A preconcentrator. The preconcentration process involves a series of steps. The first trap consists of glass beads/Tenax held at -110°C which is then heated to room temperature in order to remove water/moisture in the sample. The next trap in line consists of Tenax held at -30°C . The contaminants of interest are then desorbed at 150°C and collected on the cryofocuser held at -150°C . The sample is then rapidly heated for column injection using a Varian GC coupled with a Saturn MS detection. This method of analysis allows positive identification by retention time and molecular mass.

Concentration trends charts for some ubiquitous VOCs are provided below.

Note that for 2011, the values shown for IS 52 actually represent those from the site at Morrisania, as all monitoring at IS 52 was relocated to Morrisania in July of 2010 due to roof construction work.

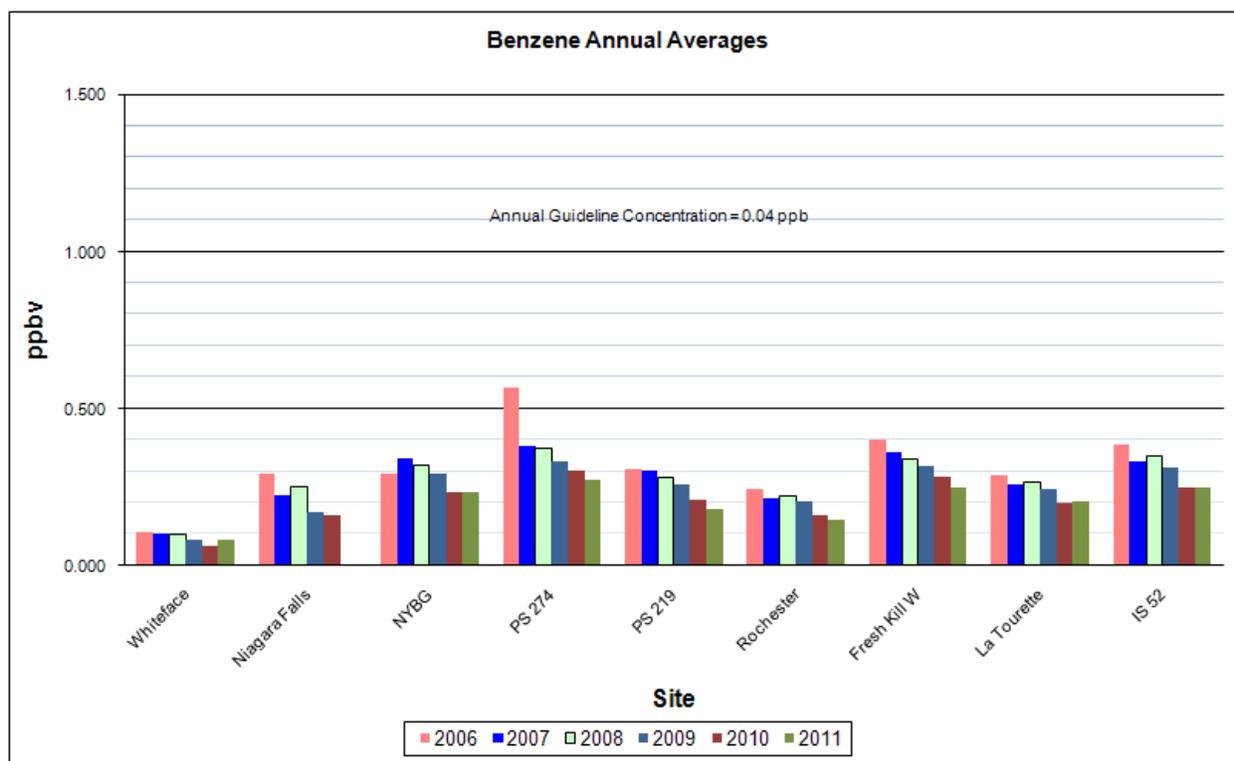


Figure 5.1 Annual Averages for Benzene

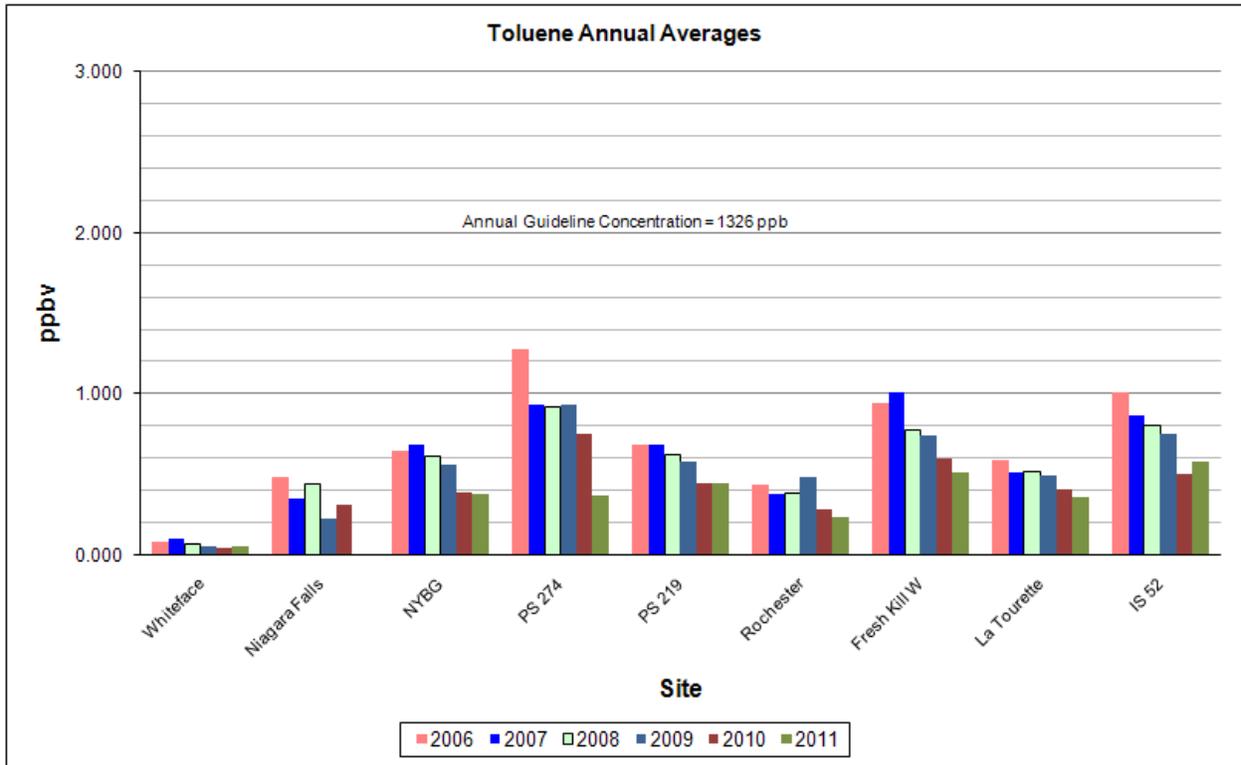


Figure 5.2 Annual Averages for Toluene

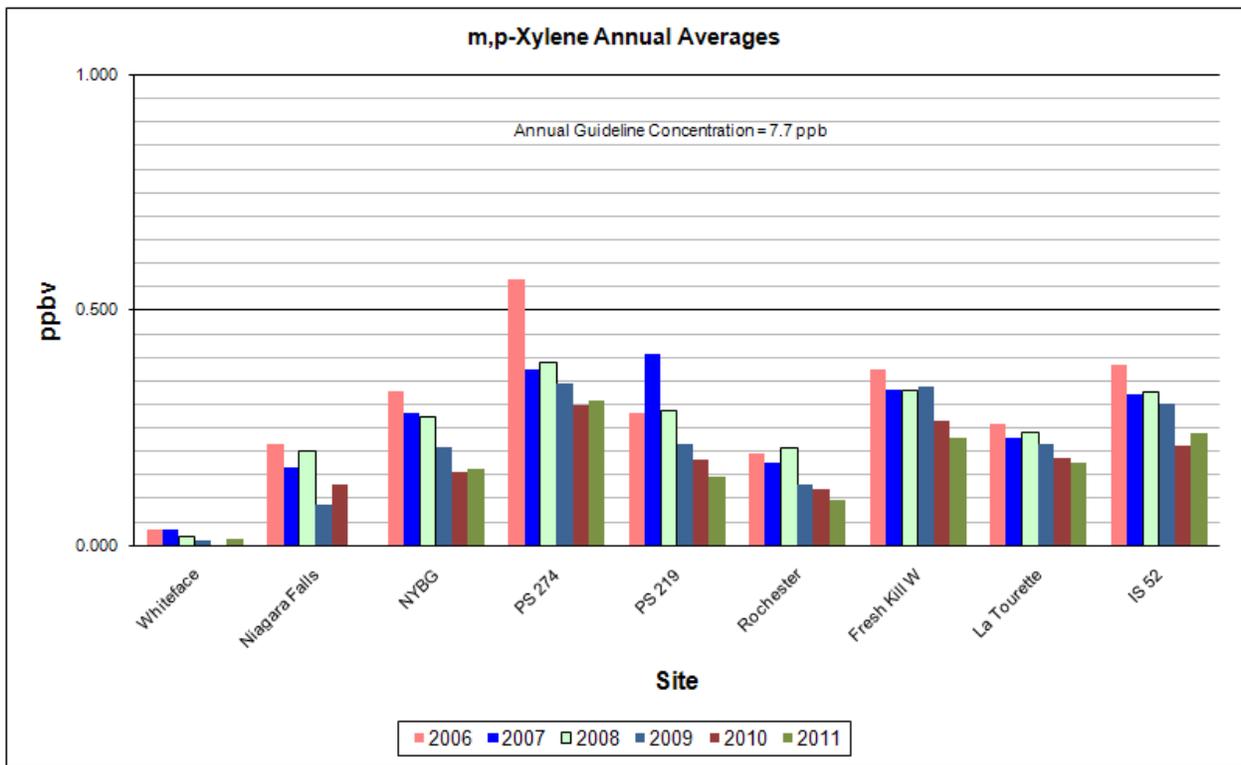


Figure 5.3 Annual Averages for m,p-Xylene

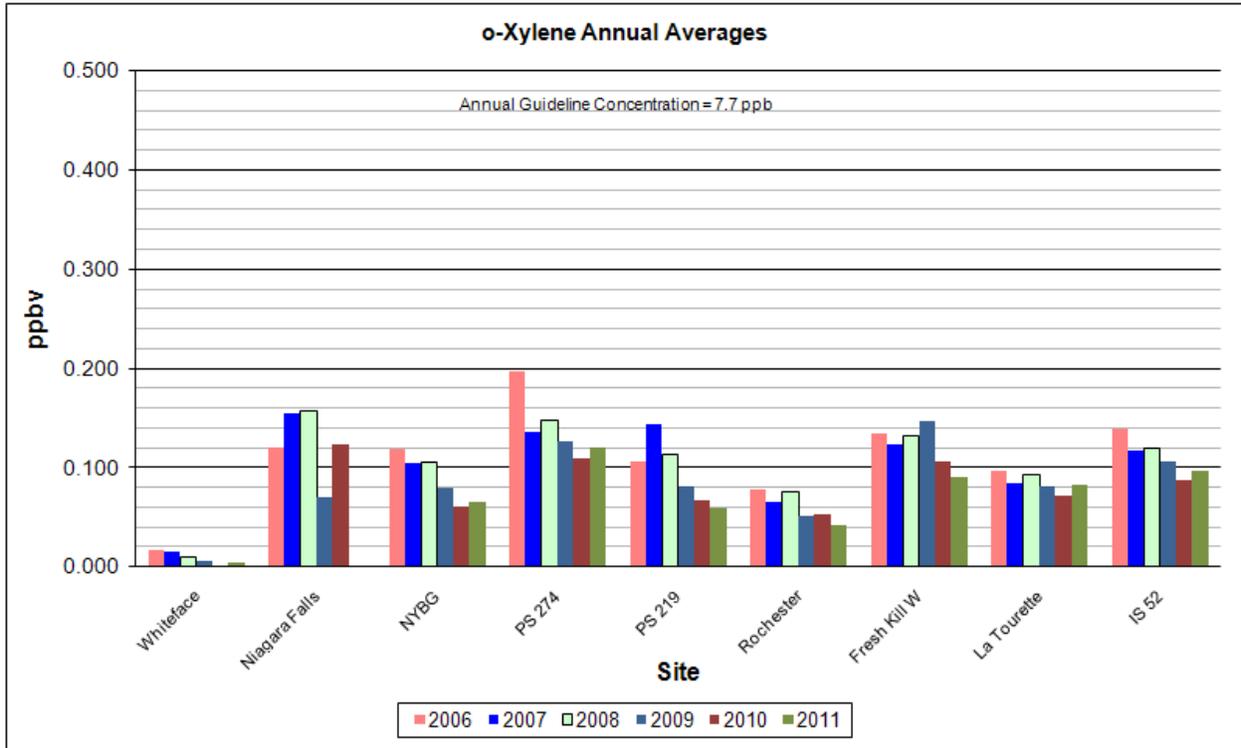


Figure 5.4 Annual Averages for o-Xylene

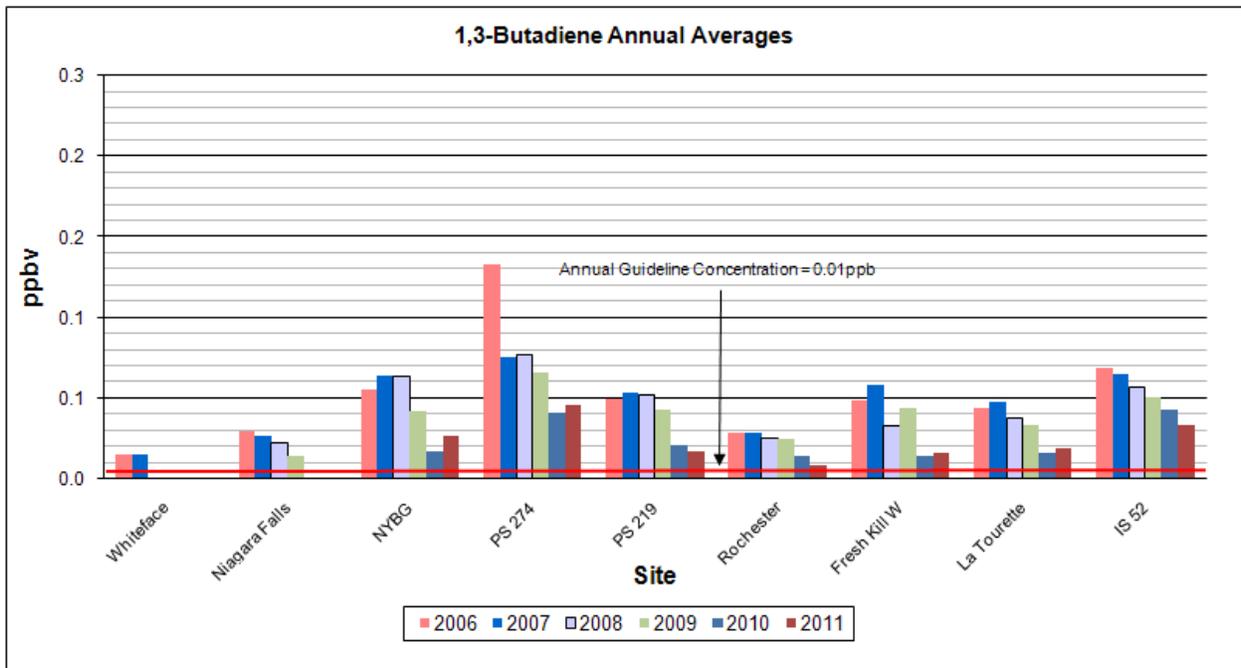


Figure 5.5 Annual Averages for 1,3-Butadiene

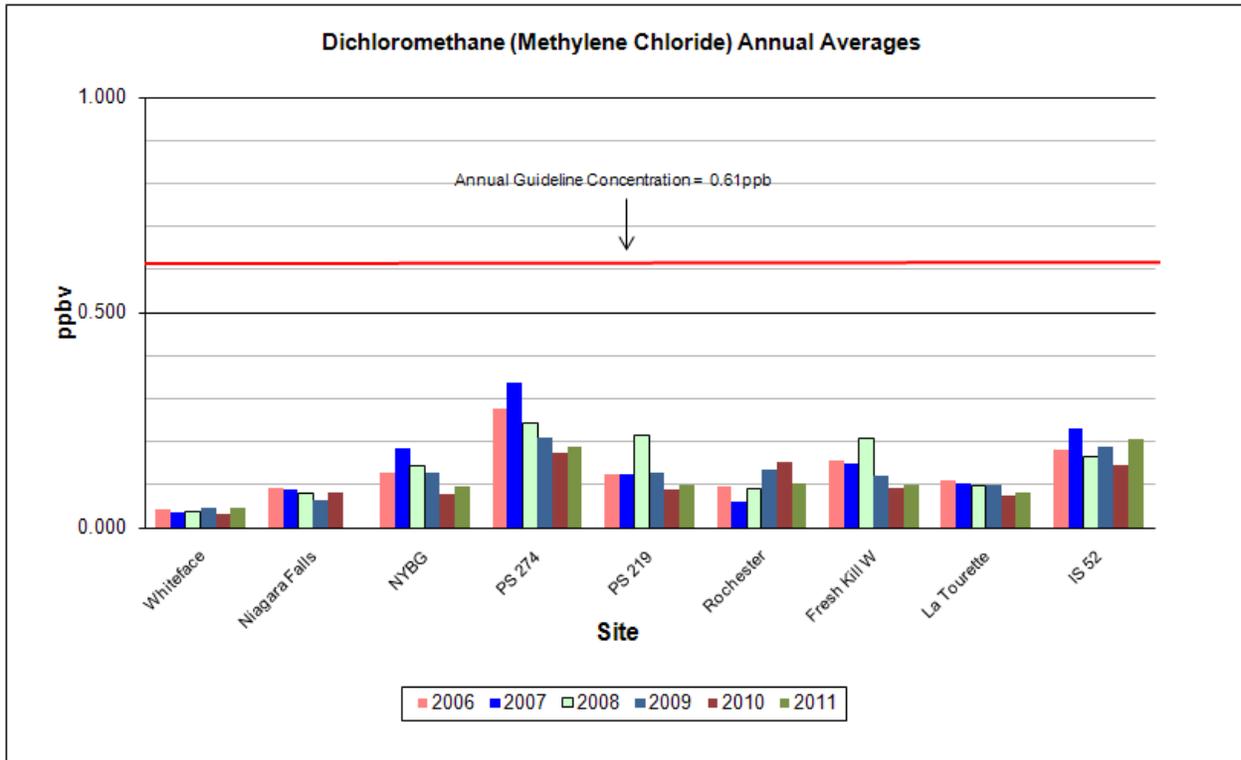


Figure 5.6 Annual Averages for Dichloromethane

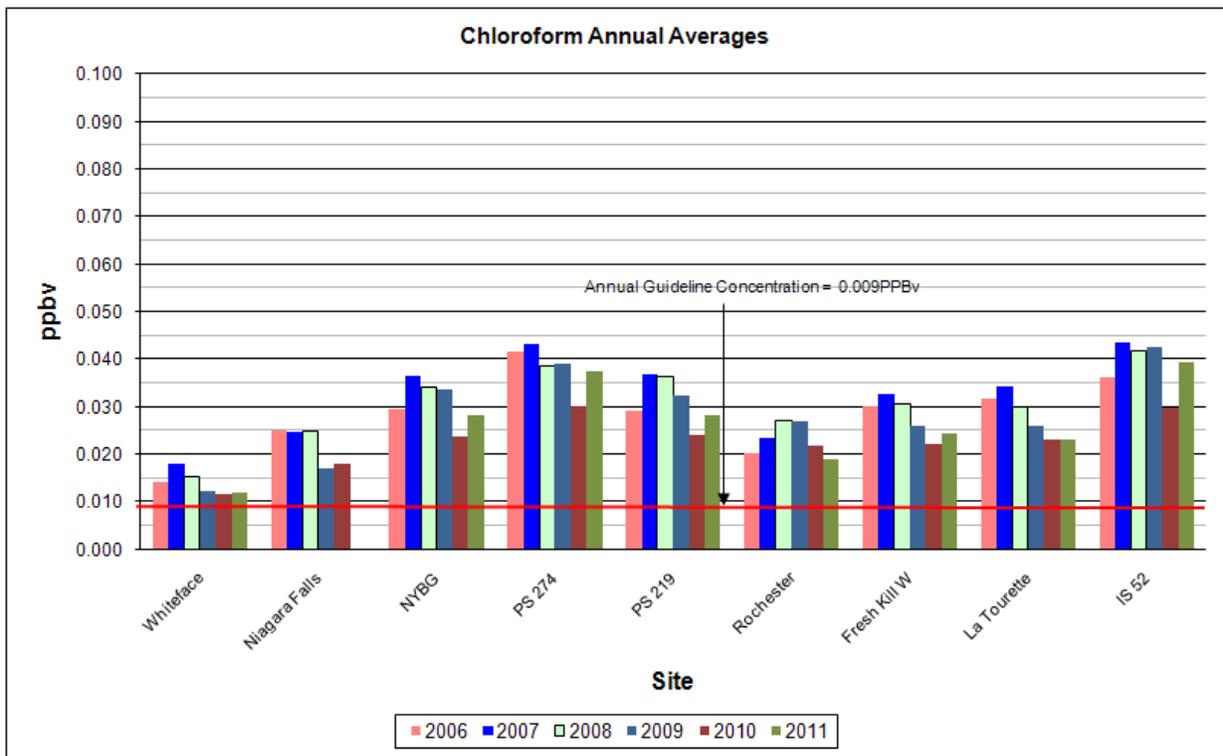


Figure 5.7 Annual Averages for Chloroform

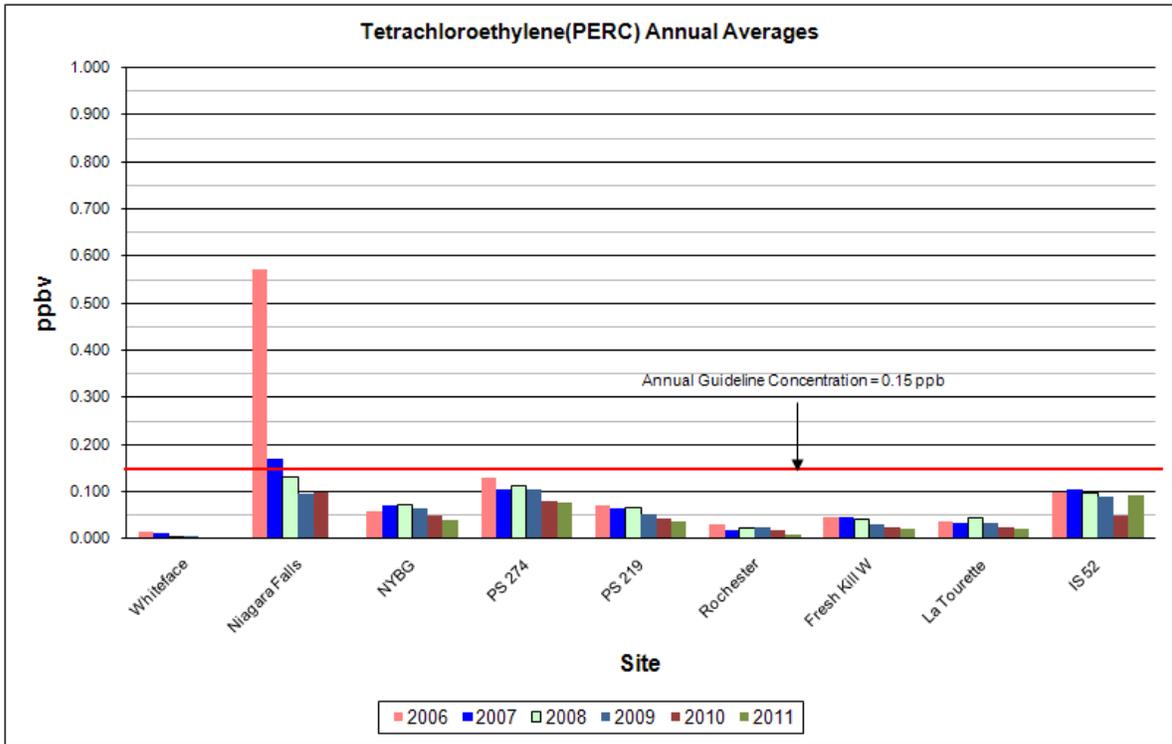


Figure 5.8 Annual Averages for Tetrachloroethene

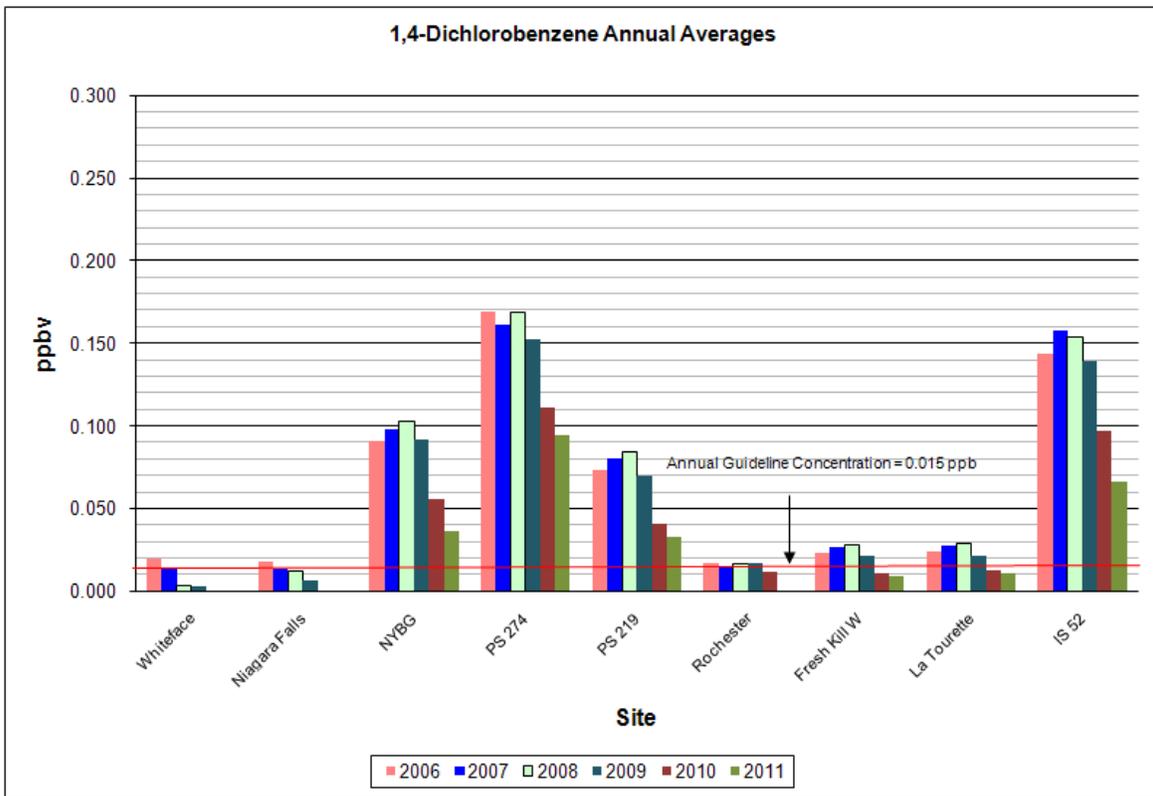


Figure 5.9 Annual Averages for 1,4-Dichlorobenzene

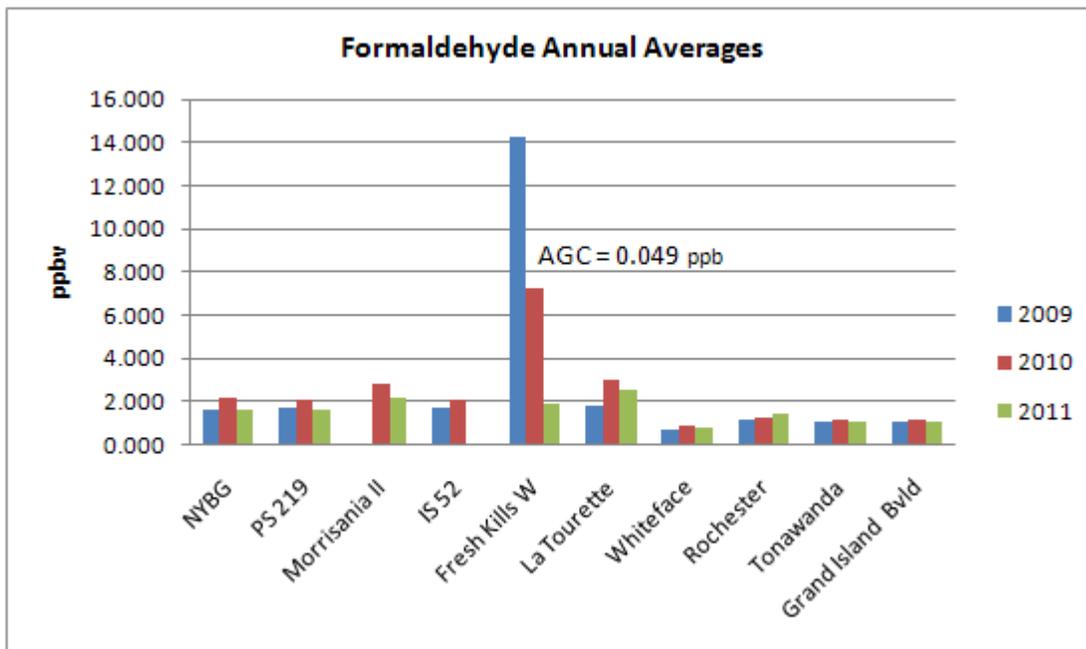


Figure 5.10 Annual Averages for Formaldehyde†

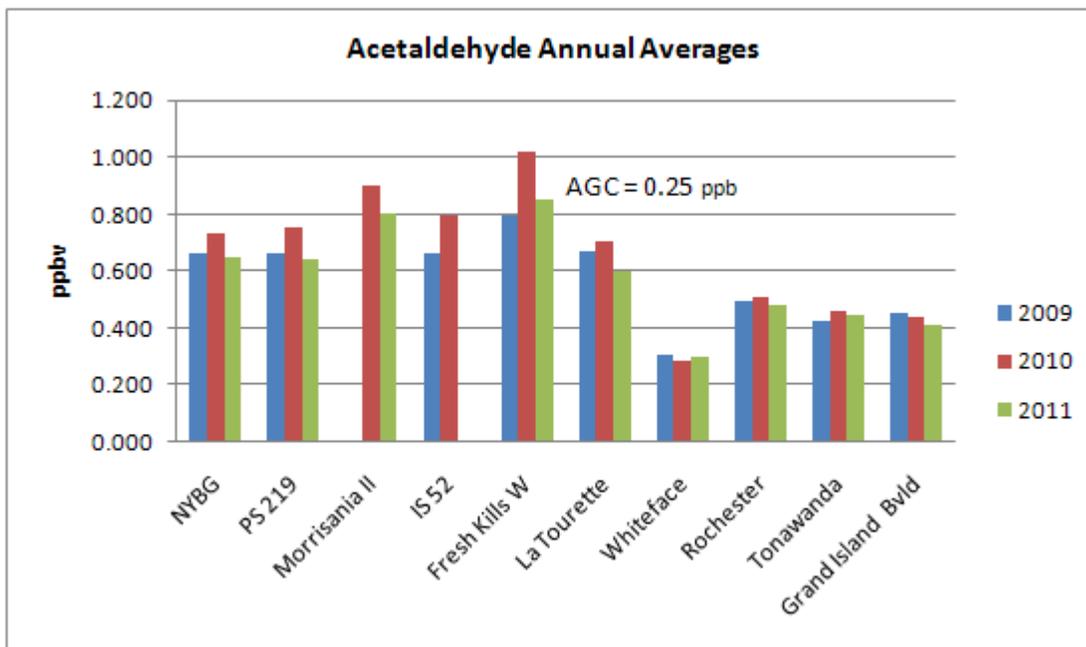


Figure 5.11 Annual Averages for Acetaldehyde†

†Note that the toxics monitoring operation at IS 52 was temporarily moved to the Morrisania II site in mid June 2010 due to extensive construction work. The values shown for 2010 represent partial year average only.

Currently there are 11 toxics monitoring sites in operation for the measurement of VOCs, and 9 sites for carbonyls statewide. These locations are shown in Figure 5.12 below.

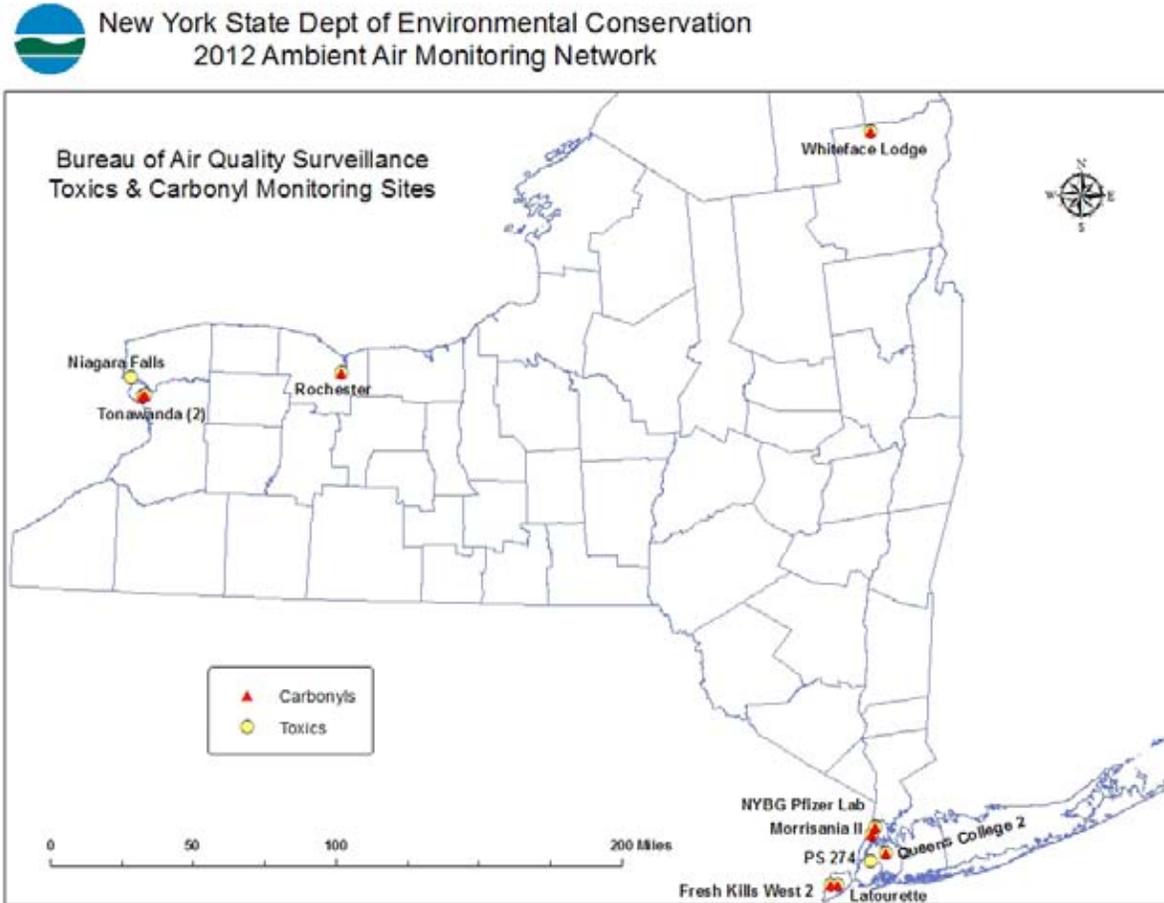


Figure 5.12 Location Map of Toxics Monitoring Sites

5.3 Photochemical Assessment Monitoring Stations (PAMS)

The 1993 revisions to 40 CFR Part 58 provide for the establishment and maintenance of network of air monitoring stations called Photochemical Assessment Monitoring Stations (PAMS) which will supplement the existing State and Local Air Monitoring Stations (SLAMS) network. The selection of parameters to be measured at a PAMS site varies with the site's ozone nonattainment designation and whether a site is upwind or downwind from O₃ precursor source areas. These parameters are O₃, total oxides of nitrogen (NO_x), nitric oxide (NO), nitrogen dioxide (NO₂), speciated volatile organic compounds (VOCs) and specific meteorological measurements.

The purpose of the PAMS program is to provide an air quality database that will assist in evaluating and modifying control strategies for attaining the O₃ National Ambient Air Quality Standard (NAAQS). PAMS data will also be used to better characterize the nature and extent of the O₃ problem, track VOC and NO_x emission inventory reductions, assess air quality trends and determine whether areas of New York remain in nonattainment of the O₃ NAAQS.

NYSDEC is required to operate and maintain two sites for metropolitan New York. The New York Botanical Gardens PAMS site (located in Northern Bronx) has been operational since 1994. The Queensborough Community College PAMS station (located in Queens) began monitoring of some species in late 1997. The Queens site was fully operational for the 1998 ozone monitoring season. This site moved to Queens College in the spring of 2001 as the QBCC building was undergoing a major renovation and the equipment had to be removed from the site. The Table 5.3 lists the chronology of monitoring at these sites.

Table 5.3 Information on PAMS Sites

Site Name	Parameters	Implementation Date
New York Botanical Garden	NO _x	Jun-94
	CO	Jun-94
	O ₃	Jun-94
	VOCs	Jun-94
	Carbonyls	Jun-94
	NMOC	Jun-99
	Meteorology	Jun-94
	NMOC	Sep-99
Queens Community College closed 12/2001	NO _x	May-98
	CO	May-98
	O ₃	May-98
	SO ₂	May-98
	VOCs	Jun-98
	Carbonyls	Sep-97
Queens College	NMOC	Aug-98
	NO _x	Jun-01
	CO	Jun-01

Site Name	Parameters	Implementation Date
	O ₃	Jun-01
	SO ₂	Jun-01
	Carbonyls	Jun-01
	NMOC	Jun-01

For gaseous parameters, Table 5.4 lists the sampling instruments and analysis methods.

Table 5.4 Instrumentation for Gaseous Pollutants

Parameter	Instrument	Analysis Method	Frequency
NO	TECO 42C	Chemiluminescent	Continuous
NO ₂	TECO 42C	Chemiluminescent	Continuous
NO _x	TECO 42C	Chemiluminescent	Continuous
O ₃	TECO 49C	Ultraviolet	Continuous
CO	TECO 48C	Infrared	Continuous
NMOC	Horiba APHA-360	Method 3000	Continuous

The following applies to meteorological measurements.

Table 5.5 Equipment for Meteorological Measurements

Parameter	Instrument or Sampling Method	Frequency
Wind Speed	SONIC	Continuous
Wind Direction	SONIC	Continuous
Temperature	Thermistor	Continuous
Relative Humidity	Hydroscopic Capacitor	Continuous
Barometric Pressure	Piezoresistive Sensor	Continuous

Carbonyls are sampled using DNPH cartridges and analyzed with HPLC according to EPA Method TO-11a. The target compound list is provided in Table 5.6 below.

Table 5.6 Target Compound List for Carbonyl Sampling

Compound	AIRS Code
acetaldehyde	43503
acetone	43551
acrolein	43505
benzaldehyde	45501
crotonaldehyde	43516
formaldehyde	43502
hexanal	43511
methacrolein	43515
m-tolualdehyde	45504
n-butyraldehyde	43510
propionaldehyde	43504
valeraldehyde	43518

Volatile organic compounds are monitored using Summa canisters samples followed by laboratory GCMS analysis as well as by an on-site realtime GC. The methods and sampling frequencies are provided in Table 5.7 below.

Table 5.7 VOC Methods and Sampling Frequencies

Sampling Method	Analytical Method	Frequency
Method TO-14a	GC/FID	Hourly
TO-15 (24-hr)	GC/MS	Every 6 day
TO-15 (40 min)	GC/MS	Once a week

The targeted compounds are listed below:

Table 5.8 PAMS Target Compounds List

Compound	AIRS #
ethene	43203
acetylene	43206
ethane	43202
propene	43205
propane	43204

Compound	AIRS #
isobutane	43214
1-butene	43280
n-butane	43212
trans-2-butene	43216
cis-2-butene	43217
3-methyl-1-butene	dropped 1995 43282
isopentane	43221
1-pentene	43224
n-pentane	43220
isoprene	43220
trans-2-pentene	43226
cis-2-pentene	43227
2-methyl-2-butene	dropped 1995 43227
2,2-dimethylbutane	43227
cyclopentane	43242
4-methyl-1-pentene	dropped 1995 43234
cyclopentene	dropped 1995 43283
2-,3-dimethylbutane	43284
2-methylpentane	43285
3-methylpentane	43230
2-methyl-1-pentene	dropped 1997 43246
n-hexane	43231
trans-2-hexene	dropped 1995 43289
cis-2-hexene	dropped 1995 43290
n-hexene	added 1997 43245
methylcyclopentane	43262
2,4-dimethylpentane	43247
benzene	45201
cyclohexane	43248
2-methylhexane	43263
2,3-dimethylpentane	43291
3-methylhexane	43249
2,2,4-trimethylpentane	43250
n-heptane	43232
methylcyclohexane	43261

Compound	AIRS #
2,3,4-trimethylpentane	43252
toluene	45202
2-methylheptane	43960
3-methylheptane	43253
n-octane	43233
ethylbenzene	45203
p/m-xylene	45109
styrene	45220
o-xylene	45204
nonane	43235
isopropylbenzene	45210
n-propylbenzene	45209
m-ethyltoluene	added 1995 45212
p-ethyltoluene	added 1995 45213
1,3,5-trimethylbenzene	45207
o-ethyltoluene	added 1995 45211
1,2,4-trimethylbenzene	45208
n-decane	43238
1,2,3 trimethylbenzene	added 1995 45225
1,3-diethylbenzene	added 1995 45218
1,4 diethylbenzene	added 1995 45219
n-undecane	43954
dodecane	added 1997 45218
tnmoc	43102
pamshc	43000

All parameters except for the summer intensive VOCs and carbonyls are run on a continuous basis year round. VOC system startup is scheduled for May 15th each year. The carbonyl's schedule of eight (3 hour) samples every third day ended in September 2005 as the requirement was dropped by EPA to reduce overall cost of the PAMS program. The VOC intensive sampling ends in September after the final system audit. Twenty-four hour carbonyl and canister samples are continued on a six day schedule throughout the year.

The on-site GC system consists of a Markes Unity Air Server-Thermal Desorber System integrated with an Agilent GC. The Summa canisters are shipped to the Rensselaer laboratory facility and analyzed with an Entech preconcentrator with a Varian GCMS System.

6. NCore Sites

The National Core Monitoring Program (NCore) is an EPA initiative to redesign a portion of the National air monitoring network. The existing compliance oriented network is set up with a parameter specific design that is targeted at the relatively high concentrations near the NAAQS. The data from this network is not as accurate at the low levels needed for trends analysis and model validation. The single parameter design is also not well suited to multi-pollutant health studies, integrated model assessment or the analysis of source attribution through comparisons of co-pollutants from sources to receptors.

The NCore program has been designed around approximately 75 sites Nationwide that are sited to represent large urban areas away from significant individual sources. A smaller subset of these sites will be located in rural areas. The NYSDEC in conjunction with EPA Region 2 office has suggested 3 of the NYSDEC monitoring sites for inclusion in this new network. The sites are:

<u>AQS ID #</u>	<u>Site Name</u>	<u>General Location</u>
36-081-0124	Queens College	Located in Kew Gardens in Queens, NYC
36-055-1007	Rochester	Located Southeast of Rochester, NY
36-101-0003	Pinnacle	Located 15 mi. Southwest of Corning, NY

Pinnacle is the only rural site of the three and it was also selected as one of ten pilot NCore sites. This site has hosted monitoring appropriate for the objectives of the NCore program due to its involvement with several research programs so it was well suited to take on the more difficult monitoring parameters required from the NCore monitoring program. SUNY Albany ASRC researchers have been making low level trace gas measurements at this site for the past ten years. Home built analyzers for low level CO and NO_y were employed. These prototype instruments required extensive post sampling data processing. They measured “true” NO₂ using direct photolysis method. Commercially available instruments are used for monitoring low level SO₂, continuous particulate sulfate, and OC/EC particulate carbon. In addition, realtime ammonia data are collected using two different methods—NO chemiluminescence with catalytic conversion, and ion mobility spectrometer. The Queens site which was recently established is preparing to monitor for some of the NCore parameters.

NCore Monitoring Objectives

- a.) Timely Reporting of Data to the Public
- b.) Support for Development of Emission Strategies
- c.) Accountability of Emission Strategy Progress
- d.) Support for Long-Term Health Assessments
- e.) Compliance
- f.) Support to Scientific Studies
- g.) Support to Ecosystem Assessments

NCore Primary Monitoring Parameters

The NCore sites are required to be sited in conjunction with the PM_{2.5} FRM network, the PM_{2.5} speciation network and the PMcoarse network. These parameters will be supplemented with the NCore specific parameters that currently include NO_y, Low Level CO and Low Level SO₂. NO_y which is defined as the sum of all reactive nitrogen oxides includes NO, and NO₂, and other nitrogen oxides referred to as NO_z. The NCore program requires NO_y monitoring because it is the best indicator of the results from NO_x reduction strategies, it is valuable for ecosystem assessments, it is important for model evaluation and it supports NO₂ estimates for health effects studies.

CO is important to the NCore program because it is used in model evaluation, it is a surrogate for many combustion related pollutants, it is included in health effect studies and it can be used to assess control programs. CO is also monitored under the existing criteria monitoring program but NCore requires more accuracy at lower concentrations and siting that makes the data more representative of wider areas than the existing network.

SO₂ is important for model evaluation because of its role in sulfate formation which is a large percentage of PM_{2.5} mass particularly in the Northeast. SO₂ is also important for some health effect studies and like CO it must be monitored accurately at low concentrations to meet the objectives of the NCore program.

Nitric acid (HNO₃) and ammonia (NH₃) are both compounds of interest in EPA's NCore program but they are not yet required because the sampling methodology is not yet fully developed. Both compounds are useful for model evaluation because of their contribution to PM formation.

To meet the monitoring requirements, trace level instruments for SO₂ and CO as well as NO_y measurements were all operational at the three NCore sites since the beginning of 2011.

7. Acid Deposition Monitoring Network

New York monitors and tests for acid deposition through the New York State Acid Deposition Monitoring Network, which was designed in 1985 to carry out requirements of the State Acid Deposition Control Act (SADCA). Measurements of acid deposition and related quantities are used to assess the effectiveness of sulfur control policy and other strategies aimed at reducing the effects of acid rain. Federal and State programs were implemented in recent years to further control emissions contributing to acid deposition. These include the NO_x and SO₂ Budget Trading Programs, and the Clean Air Interstate Rule (CAIR) Trading Programs.

The network's objectives are to:

- provide a consistent, quality-assured, long-term acid deposition database;
- measure acid deposition in sensitive receptor areas;
- measure acid deposition in urban and upwind areas;
- use these data to perform spatial and temporal analyses of acid deposition, its precursors, and its effects; and
- track the effectiveness of programs to reduce acid deposition precursor emissions.

The monitoring network consists of 16 sites located throughout the state, in both rural and urban areas. Rainfall measurements are automatically recorded, but for other parameters, samples are collected manually from each site and then transported to our Rensselaer laboratory for the analysis of pH, conductivity, cation and anion concentrations. Ion chromatography is used for the measurement of cations and anions listed in Table 7.1.

Table 7.1 Acid Deposition Target Ions List

Anions	Cations
SO ₄ ⁻ sulfate	Na ⁺ sodium
NO ₃ ⁻ nitrate	K ⁺ potassium
NO ₂ ⁻ nitrite	NH ₄ ⁺ ammonium
F ⁻ fluoride	Ca ⁺⁺ calcium
Br ⁻ bromide	Mg ⁺⁺ magnesium
Cl ⁻ chloride	
HPO ₄ ⁻ hydrogen phosphate	

The following trends charts for selected parameters show the progress made over the years through regulations and effective control strategies.

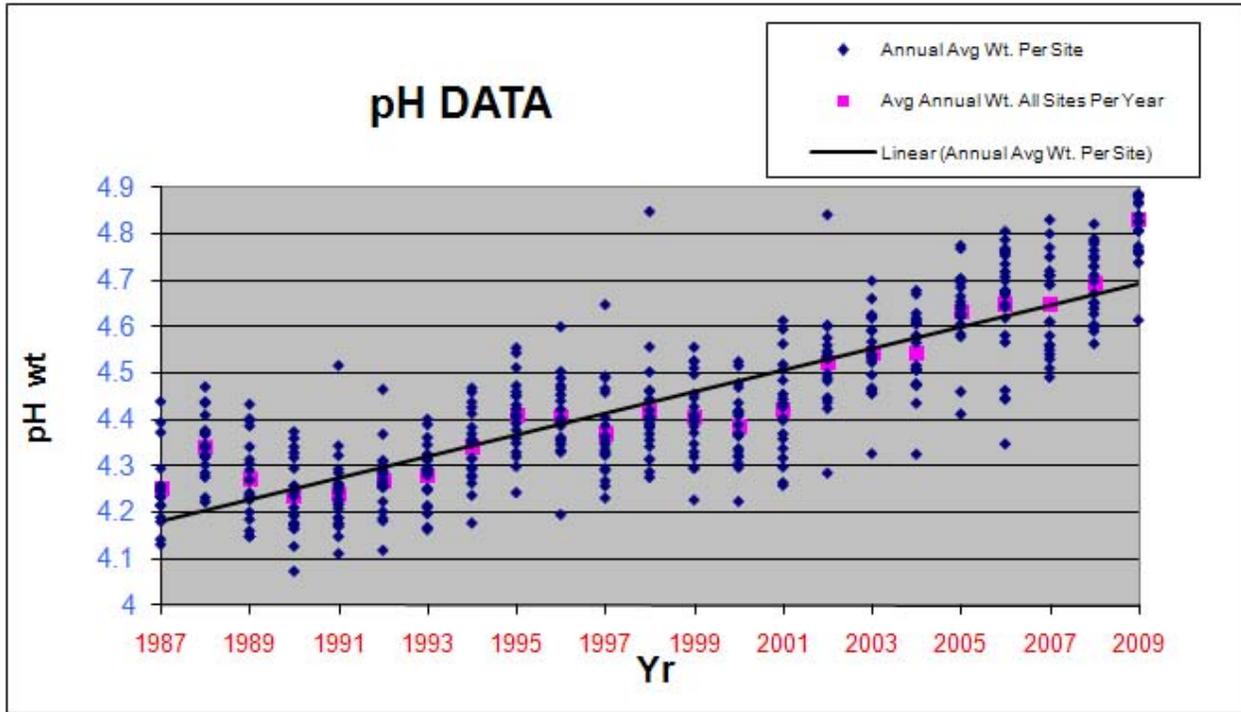


Figure 7.1 Statewide Concentration Trends Chart for pH

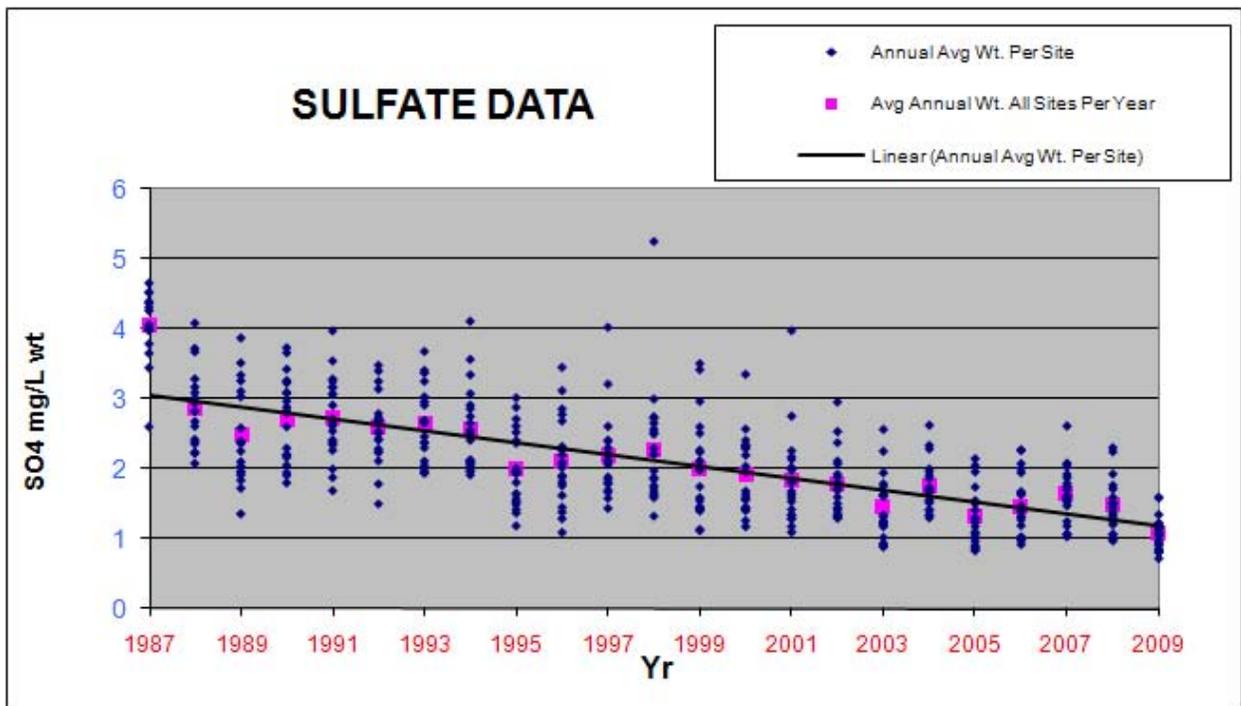


Figure 7.2 Statewide Concentration Trends Chart for Sulfate

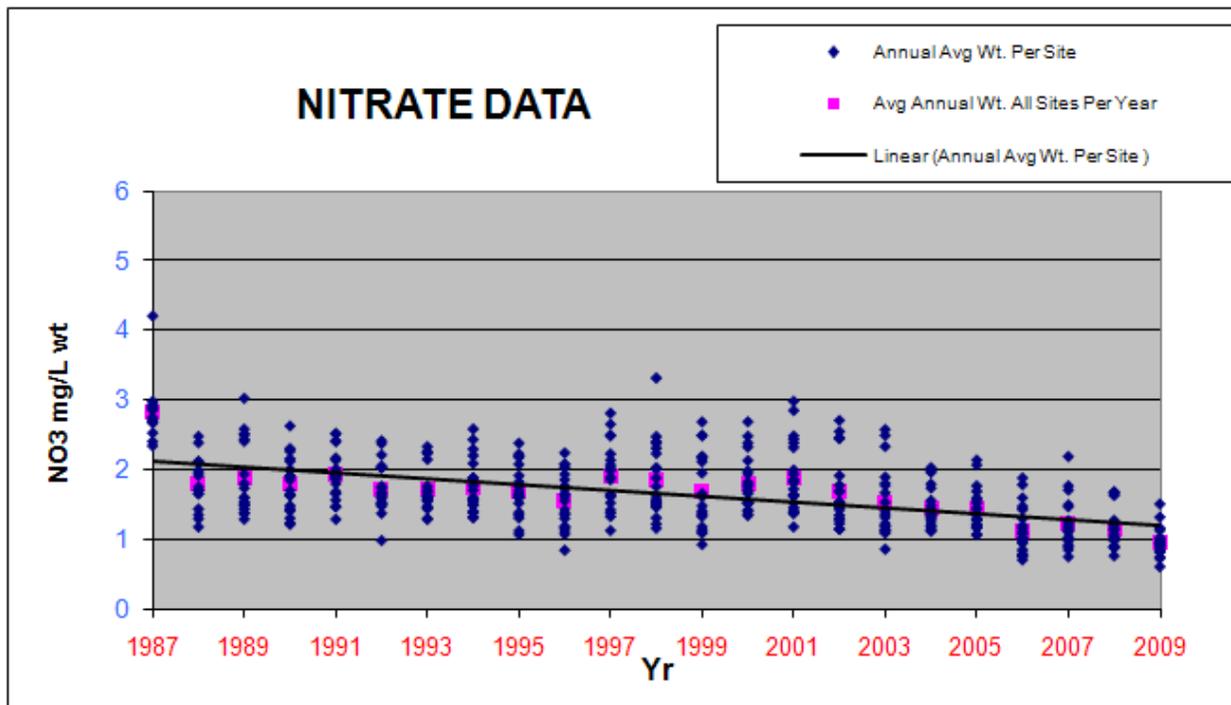


Figure 7.3 Statewide Concentration Trends Chart for Nitrate

The acid deposition monitoring program is entirely funded by State monies. A statewide map depicting the locations of the DEC monitoring sites is provided in Figure 7.4. Also shown are monitoring stations operated by the National Atmospheric Deposition Program (NADP). As shown on the map, there are certain overlaps between the two programs in area coverage. Several years ago, the manufacturer of our sampling equipment stopped supporting the antiquated models that our network uses. We have depleted our stock of spare/replacement parts for repairing our aging samplers. Upon evaluation, measurements at DEC sites Altmar, Buffalo, Loudonville, and White Plains were suspended on December 31, 2010. We further propose to close DEC sites at Belleayre, Eisenhower Park, Mt. Ninham, Nick's Lake, and Westfield; relocate equipment from Elmira to Pinnacle, Grafton to Loudonville, and Niagara Falls to Amherst in order to consolidate the entire ambient air monitoring network. The Department is actively pursuing additional capital funding to upgrade the acid deposition network sampling equipment. In the interim, these site closures will provide us with additional spare instrumentation to maintain operation at the remaining sites.



New York State Dept of Environmental Conservation
2012 Ambient Air Monitoring Network

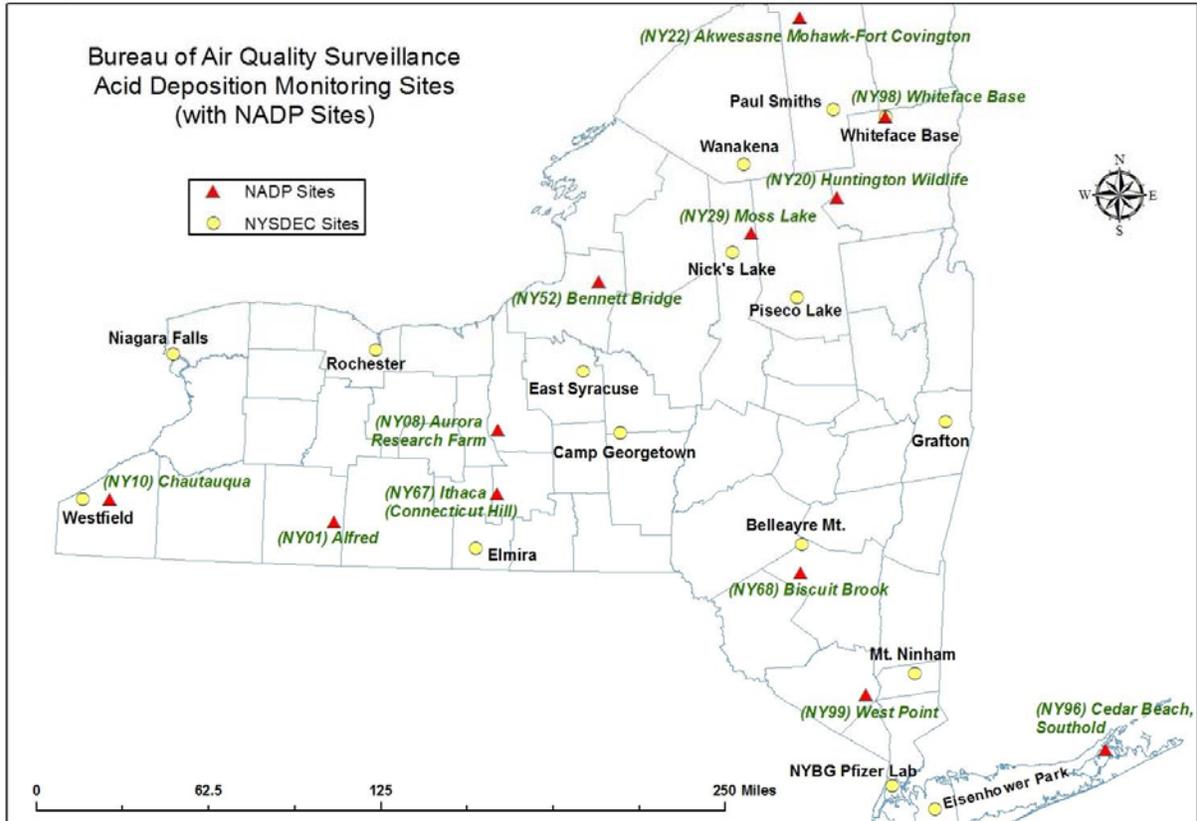


Figure 7.4 Location Map of Acid Deposition Monitoring Sites

8. Anticipated Changes in the Next 18 Months

8.1 Lead Monitoring

Revisions to the monitoring requirements became effective January 26, 2011. The new regulations replaced the population oriented monitoring requirement with a requirement to add Pb monitors to the urban NCore monitors. The EPA also lowered the emission threshold from 1.0 tpy to 0.50 tpy for industrial sources of lead (e.g., lead smelters and foundries). One source located in Orange County was determined to have the potential to violate the standard due to the amount of lead processed at the facility and the past results from nearby ambient monitoring. The NYSDEC will continue to operate the ambient lead monitor that is already operating near that facility. Routine data review showed that during the first quarter of 2011, there were a couple of sample dates that showed high levels of lead, which would lead to contravention of the new standard. Investigations at the facility led to enforcement actions although specific causes for the observed values were not discovered. Consequently an additional low volume PM₁₀ sampler was put in place to collect daily filter samples for mass measurement and lead analysis using XRF in August.

The emission threshold for airports was maintained at 1.0 tpy. In addition, an airport monitoring study will be implemented to determine the need for monitoring of airports which emit less than 1.0 tpy of lead. Under this new rule lead monitoring is required for a minimum of one year at 15 additional airports that have been identified as having characteristics that could lead to ambient lead concentrations approaching or exceeding the lead NAAQS. Brookhaven and Republic airports in Suffolk County, New York have been designated as such. Monitoring commenced at Brookhaven in October 2011, while the Republic site is expected to begin starting the second quarter, 2012.

The NYSDEC currently has two urban lead monitors at the NATTS sites (Rochester, Bronx). The Rochester site is also a designated NCore site. It is the Regional Administrator's discretion to approve site substitution for the population oriented monitoring requirement. These monitors will take advantage of the allowance for the submission of PM₁₀ lead data in place of TSP lead data. The NYSDEC acknowledges that the use of a PM₁₀ monitor for lead compliance monitoring will be discontinued and replaced with a TSP monitor if a three month average lead concentration from one of these sites exceeds 0.1µg/m³.

8.2 Special Purpose Monitors

8.2.1 Tonawanda Community Air Quality Study

Although the original study funded by EPA concluded in 2008, NYSDEC has continued sampling at two of the four study sites with State monies. The Tonawanda II site at Brookside Terrace will remain in operation as part of the permanent network, while the Grand Island Blvd. industrial site will be maintained as a special purpose monitor, resources permitting. Figures 8.1 and 8.2 illustrate trend charts for benzene and formaldehyde demonstrating emission reductions.

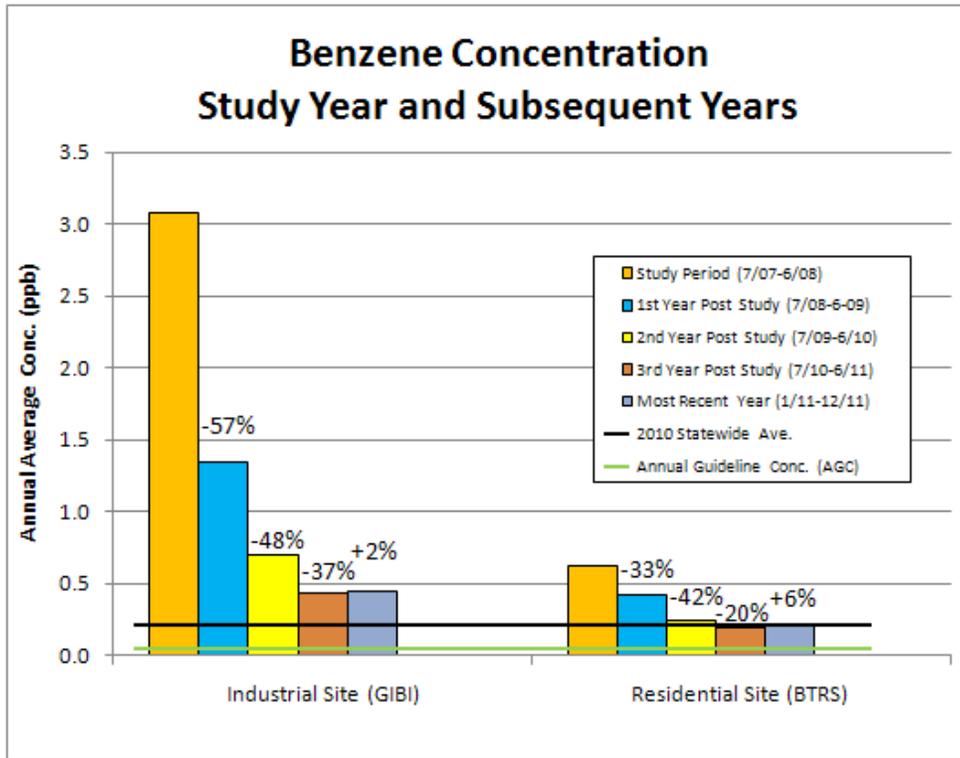


Figure 8.1 Annual Averages for Benzene at Tonawanda Sites

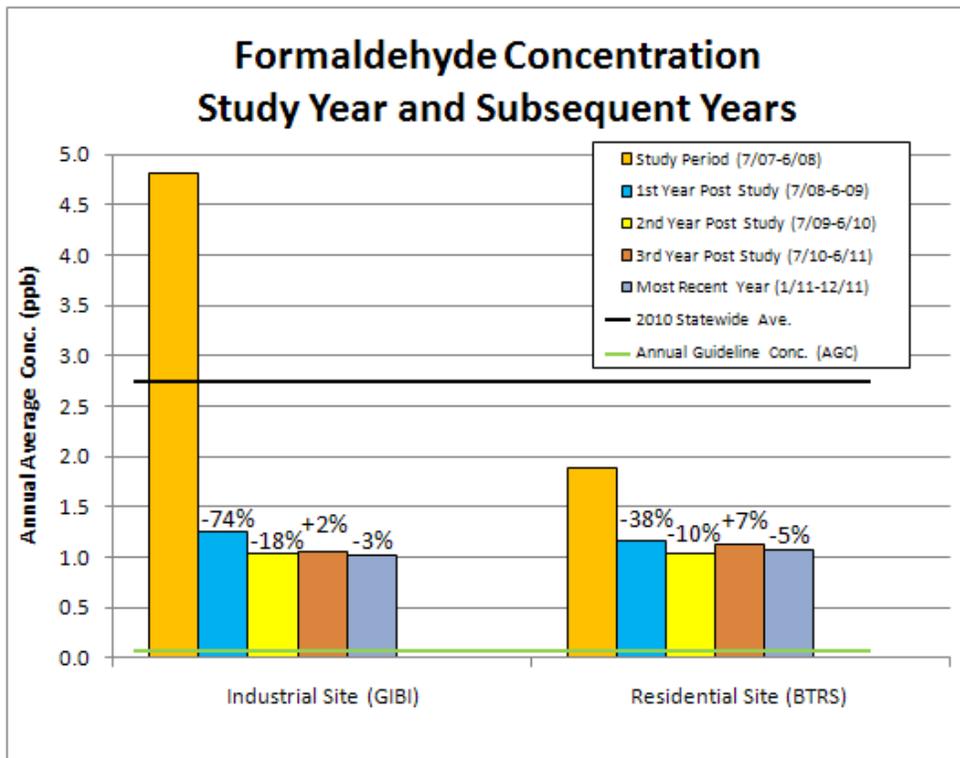


Figure 8.2 Annual Averages for Formaldehyde at Tonawanda Sites

8.2.2 New York State Ambient Mercury Baseline Study

New York has established regulations to control mercury from coal-fired powered plants in a two-phase approach, with Phase I taking effect on January 1, 2010 and Phase II taking effect on January 1, 2015. The goal of Phase I is to reduce power plant emissions by 50% from 1999 levels, and preliminary indications are that these emissions have actually been reduced by about 65%. Phase II calls for 90% emission cuts. In order to track the progress of in- and out-of-state emissions reductions, the NYSDEC seeks to continue operation and maintenance of mercury wet deposition samplers and speciated Tekran systems.

In 2008 NYSDEC was awarded an EPA grant to conduct this study at two existing urban sites: New York Botanical Garden in the Bronx (AQS Number: 36-005-0083), and Rochester (AQS Number: 36-055-1007) for a period of two years. The Tekran Model 2537B, 1130 and 1135 Mercury Speciation Units were used to measure elemental, reactive gaseous and particle bound mercury species in the ambient air. The wet deposition collector system, manufactured by N-CON Systems Co. Inc., and equipped with an ETI NOAH IV Precipitation Gauge was collocated at each site. The field data collection concluded in the fall of 2010. The results of the study were presented at the National Air Toxics Monitoring and Data Analysis Workshop in April 2011. The final report was submitted to the EPA in May 2011. The NYSDEC is seeking additional funding sources to continue data collection at these sites.

8.2.3 Community Air Screen Program

The New York State Department of Environmental Conservation (DEC), through funding provided by the United States Environmental Protection Agency (EPA), implemented a community-based screening program for toxic air pollutants. The purpose of DEC's Community Air Screen program is to conduct air quality surveillance at the community-level with the help of local community groups and interested citizens.

DEC will provide the sampling equipment, train people on how to use the equipment and work with the community to determine the best location and time period for sampling. All air sampling equipment will be returned to the DEC offices in Albany for analysis of the samples and interpretation of the results.

Approximately 12 to 18 applicants will be selected for this program. A total number of sixty (60) air samples will be analyzed statewide. The samples will be analyzed by DEC laboratory using method TO-15. Individuals as well as not-for-profits and neighborhood and community groups in New York State may apply. The deadline for application is May 24, 2012 and applicants will be notified of the selection June 25, 2012.

8.3 Proposed Changes at Existing Sites

As part of the new requirements specified in the revised Monitoring Regulations Parts 53 and 58, a network assessment was performed to determine "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." As a result of this exercise, NYSDEC is proposing the following modifications to the existing network.

8.3.1 Site Closures

Except noted otherwise the proposed closures will take place at the end of 2012. Considerations were given to factors including: redundancy, historical data, federal requirements, as well as available personnel and equipment resources. Multiple discussions amongst Division Bureaus were conducted before the final list was compiled.

8.3.1.1 Belleayre

NADP site at Biscuit Brook duplicates acid deposition measurements. Historically ozone and sulfur dioxide data have shown concentrations to be below levels of concern. Monitoring is not mandated by federal requirements.

8.3.1.2 Camden

Single parameter ozone site that shows the lowest observed levels in the entire State consistently.

8.3.1.3 Camp Georgetown

The site ceased operation in April 2012 as power was shut off when the state correctional facility was closed. The Department is pursuing to establish a substitute site at a suitable location nearby.

8.3.1.4 Elmira

Redundant monitoring at Pinnacle already, relocate acid deposition to Pinnacle. It is anticipated that an additional full suite monitoring site in the Binghamton area will be established should the Marcellus Shale gas drilling go forward.

8.3.1.5 Grafton Lakes State Park

Redundant ozone and SO₂ monitoring at Loudonville, relocate acid deposition to Loudonville, area ozone monitor also present at Stillwater.

8.3.1.6 IS 293

Redundant single parameter TEOM site.

8.3.1.7 La Tourette

Redundant monitoring at Fresh Kills West.

8.3.1.8 Manhattanville Post Office

Redundant single parameter TEOM site.

8.3.1.9 Niagara Falls

Relocate toxics and PM₁₀ to Buffalo, acid deposition and FRM PM_{2.5} to Amherst. Other redundant parameters are already monitored at these sites.

8.3.1.10 Nick's Lake

Redundant NADP acid deposition monitoring at Moss Lake.

8.3.1.11 PS 154

Redundant single parameter TEOM site.

8.3.1.12 Syracuse COM

Maintenance requirement will expire, scheduled to close in early 2013.

8.3.1.13 Westfield

Redundant Site, monitoring covered by Dunkirk.

8.3.2 Streamlining of Monitored Parameters

8.3.2.1 Amherst

Discontinue redundant NO_x monitoring.

8.3.2.2 Eisenhower Park

Discontinue acid deposition monitoring.

8.3.2.3 Morrisania II

Move NATTS parameters back to original site at IS 52. A continuous TEOM PM_{2.5} instrument will replace the FRM PM_{2.5} monitor.

8.3.2.4 Mt. Ninham

Discontinue acid deposition monitoring, redundant NADP site at West Point.

8.3.2.5 New York Botanical Garden

Discontinue continuous GC for PAMS measurements at Pfizer Lab, not required under current ozone nonattainment classification. Sensitivity deterioration and frequent failures have rendered the measurements unreliable and of limited value.

8.3.2.6 PS 19

Discontinue redundant PM₁₀ monitoring.