State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JON S. CORZINE
Governor

MARK N. MAURIELLO
Acting Commissioner

January 15, 2010

The Honorable Judith A. Enck
Regional Administrator
United States Environmental Protection Agency – Region 2
290 Broadway- 26th Floor
New York, New York 10007-1866

Dear Regional Administrator Enck:

Enclosed please find the "Certification for Meeting the Infrastructure Requirements in the Clean Air Act, for the 35 $\mu g/m^3$ 24-hour (2006) Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)." Specifically, this certification document ("Certification") addresses requirements under 42 U.S.C. § 7410(a)(1) and (2) (Sections 110(a)(1) and (2) of the Clean Air Act) for the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ health-based standards of 2006. New Jersey certifies compliance with these elements through its existing SIP, and as described in this Certification.

On February 25, 2008, New Jersey submitted an Infrastructure SIP revision to the United States Environmental Protection Agency (USEPA) addressing the requirements under Section 110(a)(1) and (2) for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS. According to the USEPA guidance, the State only needs to certify that it has sufficient authority to implement the Clean Air Act requirements and submit a SIP revision addressing the transport requirements. The attached certification document ("Certification") satisfies the USEPA's 2009 guidance to address the infrastructure requirements for the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ (2006) NAAQS.

Regarding the 2008 Infrastructure SIP, on October 22, 2008, the USEPA published a "finding of failure to submit specific elements…" for New Jersey's 2008 Infrastructure SIP, based on the status of New Jersey's Prevention of Significant Deterioration (PSD) rules and New Jersey's Emergency Action Plan status. This Certification addresses the Emergency Action Plan deficiency and certifies New Jersey PSD program. This update should enable the USEPA to find that the State meets these requirements.

With respect to the interstate transport section that addresses significant contribution, New Jersey discusses the impacts and its remedy for the transported air pollution from New Jersey's sources to downwind states. New Jersey has reduced its significant contributions to other states by implementing its own rules that are more stringent than the Federal CAIR, in

addition to other recent rulemakings, as well as measures that have been in place for many years to address its contribution to transport. With these actions, New Jersey is addressing its contribution to the downwind areas. If other states implemented similar measures to New Jersey to address their significant contribution, then the issue of transported pollution would decrease immensely. It is the responsibility of the USEPA to continue to address interstate transport on a national level by completing the Clean Air Transport Rule, i.e., the replacement rule for the Federal CAIR, and other federal measures.

The enclosed Certification demonstrates New Jersey's compliance with 42 U.S.C. § 7410(a)(1) and (2) (Sections 110(a)(1) and (2) of the Clean Air Act) for the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ health-based standards of 2006. If the USEPA has any outstanding issues with the submittal, New Jersey will need additional detailed guidance on how to address the issues.

If you have any questions regarding this SIP revision, please contact William O'Sullivan, Director of the Division of Air Quality, at (609) 984-1484.

Sincerely yours,

Mark N. Mauriello
Acting Commissioner

Enclosures

c: Nancy Wittenberg, NJDEP Assistant Commissioner, w/o enclosures
William O'Sullivan, NJDEP Director, w/o enclosures
Ray Werner, USEPA Region 2, w/o enclosures
Richard Ruvo, USEPA Region 2, w/o enclosures
Ken Fradkin, USEPQ Region 2, w/o enclosures

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

January 2010

Preface

The State of New Jersey is submitting a certification document ("Certification") to address the requirements under 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Clean Air Act) for the 35 µg/m^3 24-hour (2006) Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS). On February 25, 2008, New Jersey submitted an Infrastructure State Implementation Plan (SIP) revision to the United States Environmental Protection Agency (USEPA) addressing the requirements under Section 110(a)(1) and (2) for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS. The USEPA published findings on this SIP revision on October 22, 2008 but there has been no further action taken on this SIP revision. In addition, since there has been no change in authority with respect to the infrastructure requirements, the focus of this document is on 42 U.S.C. § 7410(a)(2)(D) (Section 110(a)(2)(D)) that addresses interstate transport and those sections which were affected by the USEPA findings which include Enforcement and Stationary Source Permitting; Emergency Powers and Contingency Plans; and Consultation, Public Notification, and Prevention of Significant Deterioration (PSD) (42 U.S.C. § 7410(a)(2)(C), (G), and (J) (Sections 110(a)(2)(C), (G), and (J))).

Acknowledgements

The New Jersey Department of Environmental Protection acknowledges the efforts and assistance of the agencies and individuals whose contributions were instrumental in the preparation of this Certification. In particular, the New Jersey Department of Environmental Protection wishes to acknowledge the individuals within the United States Environmental Protection Agency Region 2 for their assistance on this matter.

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Acronyms and Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
AELs	Alternative Emission Limits
AQRV	Air Quality Related Value
AQS	Air Quality System
BART	Best Available Retrofit Technology
CAIR	Clean Air Interstate Rule
C.F.R.	Code of Federal Regulations
EGUs	Electric Generating Units
Fed. Reg.	Federal Register
FLM	Federal Land Manager
FSELs	Facility-Specific Emission Limits
HEDD	High Electrical Demand Day
I/M	Inspection and Maintenance
IMPROVE	Interagency Monitoring of Protected Visual Environments
km	kilometer
lb/mmBTU	Pounds per million British Thermal Units
LADCO	Lake Michigan Area Directors Consortium
MANE-VU	Mid-Atlantic/Northeast-Visibility Union
MARAMA	Mid-Atlantic Regional Air Management Association
NAAQS	National Ambient Air Quality Standards
NESCAUM	Northeast States for Coordinated Air Use Management
N.J.A.C.	New Jersey Administrative Code
N.J.R.	New Jersey Register
N.J.S.A.	New Jersey Statutes Annotated
NO_x	Oxides of Nitrogen
NSR	New Source Review
NNSR	Nonattainment New Source Review
OBD	On-board Diagnostics
OTC	Ozone Transport Commission
PM	Particulate Matter
PM_{10}	Coarse Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
ppb	Parts per billion
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RAVI	Reasonably Attributable Visibility Impairment
SHL	Significant Harm Level
SIL	Significant Increment Level
SIP	State Implementation Plan
SMC	Significant Monitoring Concentration
SO_2	Sulfur Dioxide
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

Executive Summary

When the United States Environmental Protection Agency (USEPA) establishes a new or makes a revision to a National Ambient Air Quality Standards (NAAQS), the Federal Clean Air Act requires the states to submit to the USEPA a State Implementation Plan (SIP) revision[1] or certification indicating that the State has the authority to develop, implement, and enforce an air quality management program that provides for attainment and maintenance of the NAAQS. These elements are sometimes compiled and submitted separately in what is referred to as an "Infrastructure" SIP. For the purposes of the 35 micrograms per cubic meter ($\mu g/m^3$) 24-hour (2006) Fine Particulate Matter ($PM_{2.5}$) NAAQS, the USEPA guidance allows a state to submit a certification letter without holding an additional public hearing if that state determines that it meets the requirements in 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Federal Clean Air Act) without further revising its existing SIP.[2]

Since the USEPA promulgated a revised particulate matter (PM) NAAQS on September 21, 2006, the State of New Jersey is submitting a certification document ("Certification") to address the requirements in 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Federal Clean Air Act) for the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS. The February 2008 Infrastructure SIP addressed the 1997 8-hour ozone standard and the 1997 annual $PM_{2.5}$ standard.[3] New Jersey certifies compliance with these elements through its existing SIP, and as described in this Certification.

Since the 2008 SIP revision, the only statutory authority for air quality management in New Jersey enacted addressed global warming. Thus, no changes to the basic program authorities occurred. However, on October 22, 2008, the USEPA published findings for New Jersey's 2008 Infrastructure SIP affecting Enforcement and Stationary Source Permitting; Emergency Powers and Contingency Plans; and Consultation, Public Notification, and Prevention of Significant Deterioration (PSD) (42 U.S.C. § 7410(a)(2)(C), (G), and (J) (Sections 110(a)(2)(C), (G), and (J))).[4] Based upon guidance from the USEPA on these sections, and the other required elements under 42 U.S.C. § 7410(a)(2) listed in Table ES1, this Certification focuses on the sections that the USEPA published findings for in October 2008 and Section 110(a)(2)(D) that addresses interstate transport.[5] Table ES1 provides the citations for New Jersey's authority in the State's statutes, including the Air Pollution Control Act.

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[1] 42 U.S.C. § 7410(a)(1).

[2] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[3] NJDEP. State Implementation Plan Revision for Meeting the Infrastructure Requirements of the Clean Air Act. New Jersey Department of Environmental Protection, February 2008. Other than the findings from the USEPA on October 22, 2008 (73 Fed. Reg. 62904), there has been no further action taken on this SIP revision.

[4] 73 Fed. Reg. 62904 (October 22, 2008).

[5] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

Table ES1: Infrastructure Elements Required under the Federal Clean Air Act (42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

Section 110(a)(2) Element	Summary of Element	New Jersey Authority
110(a)(2)(A)	Enforceable Emission Limitations and Other Control Measures	N.J.S.A. 26:2C-8, 9, and 19 N.J.A.C. 7:27
110(a)(2)(B)	Air Quality Monitoring, Compilation, Data Analysis, and Reporting	N.J.S.A. 26:2C-9.a.
110(a)(2)(C)	Enforcement and Stationary Source Permitting	N.J.S.A. 26:2C-19 N.J.A.C. 7:27 and 7:27A
110(a)(2)(D)	Interstate Transport of Air Pollution and International Pollution Abatement	N.J.A.C. 7:27 N.J.A.C. 7:27-22.11(k) N.J.A.C. 7:27-22.24 N.J.S.A. 26:2C-8.11 N.J.S.A. 26:2C-9
110(a)(2)(E)	Resources, Conflict of Interest, and Emergency Backstop	N.J.S.A. 26:2C-8 N.J.S.A. 13:1D-9 N.J.S.A. 52:13D-12 et seq. N.J.S.A. 26:2C-22
110(a)(2)(F)	Stationary Source Emissions Monitoring and Reporting	N.J.S.A. 26:2C-9.2 N.J.A.C. 7:27
110(a)(2)(G)	Emergency Powers and Contingency Plans	N.J.S.A. 26:2C-26 et seq. N.J.A.C. 7:27-12
110(a)(2)(H)	State Implementation Plan Revision For Revised Air Quality Standards or New Attainment Methods	N.J.S.A. 13:1D-9
110(a)(2)(I)	State Implementation Plan for Nonattainment Areas	N.J.S.A. 13:1D-9
110(a)(2)(J)	Consultation, Public Notification, and Prevention of Significant Deterioration	N.J.S.A. 26:2C-8, 9, and 19 N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.
110(a)(2)(K)	Air Quality Modeling and Reporting	N.J.A.C. 7:27-8.5 and 22.8
110(a)(2)(L)	Major Stationary Source Permitting Fees	N.J.A.C. 7:27-22.31
110(a)(2)(M)	Consultation with Local Entities	N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.

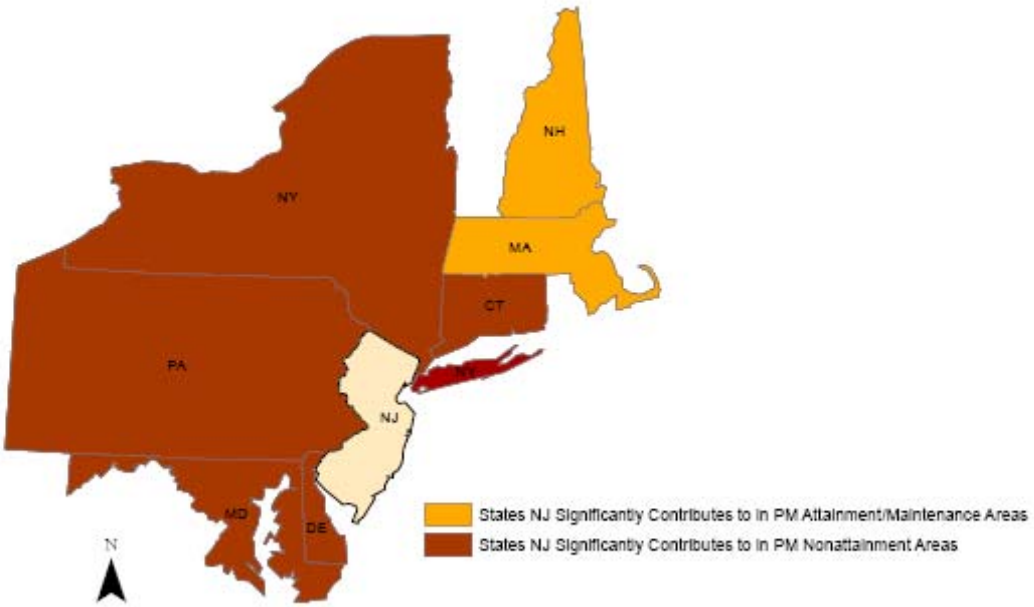
Regarding the Part C PSD permit program for $PM_{2.5}$, in absence of the USEPA final rule $PM_{2.5}$ increments, significant impact levels (SILs), and significant monitoring concentrations (SMCs),[6] at the time of this Certification, New Jersey is implementing its own interim permitting and modeling procedures for sources emitting $PM_{2.5}$ emissions. The interim procedures require inclusion of both filterable and condensable $PM_{2.5}$ emissions in the air quality modeling evaluation and compares the conservative determination of $PM_{2.5}$ emissions (based on PM_{10}, including condensable particulate matter) to the $PM_{2.5}$ NAAQS. New Jersey does not follow the USEPA's 1997 PM_{10} surrogate policy for $PM_{2.5}$. New Jersey's approach is more protective of health and the environment than the interim Federal approach.

In order to assess the State's significant contributions to the downwind nonattainment or maintenance areas of the 24-hour $PM_{2.5}$ NAAQS, New Jersey utilizes a weight-of-evidence

[6] 72 Fed. Reg. 54112-54156 (September 21, 2007).

approach, using the best data available. This analysis indicates that New Jersey significantly contributes to Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, and Pennsylvania. While the methods analyzed did not identify Delaware as a state that New Jersey impacts, the methods did identify all of the states surrounding Delaware. Hence, New Jersey includes Delaware among the other states to which New Jersey significantly contributes, as shown in Figure ES1.

Figure ES1: States to which New Jersey Significantly Contributes with respect to Fine Particulate Concentrations based upon a Weight-of-Evidence Approach



New Jersey has taken a number of recent actions, as well as measures that have been in place for many years to address its contribution to downwind areas. With these actions, New Jersey is confident that it is adequately addressing its contribution to the downwind areas.

New Jersey is also proposing or evaluating additional measures that would further reduce $PM_{2.5}$ emissions. New Jersey will consider any additional measures, implemented by the neighboring upwind and downwind states, if they would provide additional emission reductions in the State. Thus, New Jersey is complying with the Federal Clean Air Act requirements regarding interstate transport as it relates to the $PM_{2.5}$ NAAQS and is doing more to ensure that it is not interfering with the ability of its neighboring states to attain and maintain that standard or visibility goals.

Applying the same weight-of-evidence approach, the states shown in Table ES2 significantly contribute to New Jersey's $PM_{2.5}$ nonattainment in its thirteen (13) counties designated as not attaining the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS and interfere with the maintenance of attainment in the remaining eight (8) counties.

Table ES2: Summary of Significant Contributions from Other States' to New Jersey's Fine Particulate Matter Nonattainment and Maintenance

Analysis	$PM_{2.5}$ CAIR Modeling	8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling	Significant Contribution? (Y/N)
State(s)/Area(s)	**NJ Only**	**NJ Only**	**NJ Only**	**NJ Only**	**NNJ/NY/CT[2]**	
Canada					x	Y
CENRAP[3]_WRAP[4]_South					x	Y
Connecticut					x (combined with Rhode Island)	Y
Delaware		x	x	x	x	Y
District of Columbia			x			Y
Georgia				x		Y
Illinois			x	x	x	Y
Indiana			x	x	x	Y
Kentucky			x	x	x	Y
Maryland	x (combined with D.C.)	x (combined with D.C.)	x	x	x (combined with D.C.)	Y
Massachusetts					x	Y
Michigan	x	x	x	x	x	Y
New York	x	x	x	x	x	Y
North Carolina			x	x	x	Y
Ohio	x	x	x	x	x	Y
Pennsylvania	x	x	x	x	x	Y
South Carolina				x		Y
Tennessee				x		Y
Virginia	x	x	x	x	x	Y
West Virginia	x	x	x	x	x	Y

1. Contributing states included those with a sulfate contribution >2%; Illinois and New York are also included based upon other modeling techniques (see New Jersey's Regional Haze SIP).
2. Northern New Jersey/New York/Connecticut nonattainment area
3. CENRAP = Central Regional Air Planning Association. CENRAP is an organization of states, tribes, federal agencies. The states included are Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana.
4. WRAP = Western Regional Air Partnership. The WRAP is made up of western states, tribes, and federal agencies. The states are Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

New Jersey is meeting the contingency plan portion of section 110(a)(2)(G) element concerning emergency powers and adequate contingency plans according to 40 C.F.R. 51.150 and Federal guidance. According to the USEPA's 2009 guidance,[7] New Jersey is not required to have a

[7] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle (PM2.5) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

contingency plan at this time, given that the existing monitored levels of 24-hour $PM_{2.5}$ have not exceeded 140.4 µg/m^3 since 2006; however, New Jersey has rules at N.J.A.C. 7:27-12 for emergency episodes for particulate matter. The USEPA is also using these conditions to resolve the finding of failure to submit issued for the annual (1997) $PM_{2.5}$ NAAQS (see Appendix C).

Through this Certification, the State of New Jersey is demonstrating that the infrastructure and transport requirements under 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Clean Air Act) for the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ NAAQS have been satisfied.

I. Introduction

When the United States Environmental Protection Agency (USEPA) establishes a new or makes a revision to a National Ambient Air Quality Standards (NAAQS), the Federal Clean Air Act requires the states to submit to the USEPA a State Implementation Plan (SIP) revision[1] or certification indicating that the State has the authority to develop, implement, and enforce an air quality management program that provides for attainment and maintenance of the NAAQS. These elements are sometimes compiled and submitted separately in what is referred to as an "Infrastructure" SIP. By Federal statute at 42 U.S.C. § 7410(a)(1) (Section 110(a)(1)), SIPs meeting the requirements of Section 110(a)(1) and (2) are to be submitted by states within three (3) years after promulgation of a new or revised standard. Table 1.1 provides the citations for New Jersey's authority in the State's statutes, including the Air Pollution Control Act.

Table 1.1: Infrastructure Elements Required under the Federal Clean Air Act (42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

Section 110(a)(2) Element	Summary of Element	New Jersey Authority
110(a)(2)(A)	Enforceable Emission Limitations and Other Control Measures	N.J.S.A. 26:2C-8, 9, and 19 N.J.A.C. 7:27
110(a)(2)(B)	Air Quality Monitoring, Compilation, Data Analysis, and Reporting	N.J.S.A. 26:2C-9.a.
110(a)(2)(C)	Enforcement and Stationary Source Permitting	N.J.S.A. 26:2C-19 N.J.A.C. 7:27 and 7:27A
110(a)(2)(D)	Interstate Transport of Air Pollution and International Pollution Abatement	N.J.A.C. 7:27 N.J.A.C. 7:27-22.11(k) N.J.A.C. 7:27-22.24 N.J.S.A. 26:2C-8.11 N.J.S.A. 26:2C-9
110(a)(2)(E)	Resources, Conflict of Interest, and Emergency Backstop	N.J.S.A. 26:2C-8 N.J.S.A. 13:1D-9 N.J.S.A. 52:13D-12 et seq. N.J.S.A. 26:2C-22
110(a)(2)(F)	Stationary Source Emissions Monitoring and Reporting	N.J.S.A. 26:2C-9.2 N.J.A.C. 7:27
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110(a)(2)(K)	Air Quality Modeling and Reporting	N.J.A.C. 7:27-8.5 and 22.8
110(a)(2)(L)	Major Stationary Source Permitting Fees	N.J.A.C. 7:27-22.31
110(a)(2)(M)	Consultation with Local Entities	N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.

[1] 42 U.S.C. § 7410(a)(1).

For the purposes of the 35 micrograms per cubic meter (µg/m^3) 24-hour (2006) Fine Particulate Matter ($PM_{2.5}$) NAAQS, the USEPA guidance allows a state to submit a certification letter without holding an additional public hearing if that state determines that it meets the requirements in 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Federal Clean Air Act) without further revising its existing SIP.[2] The State submitted a SIP revision providing these authorities in February 2008.[3] Since the 2008 SIP revision, the only statutory authority related to air quality management in New Jersey enacted addressed global warming.[4] Thus, no changes to the basic program authorities occurred. However, on October 22, 2008, the USEPA published findings for New Jersey's 2008 Infrastructure SIP affecting Enforcement and Stationary Source Permitting; Emergency Powers and Contingency Plans; and Consultation, Public Notification, and Prevention of Significant Deterioration (PSD) (42 U.S.C. § 7410(a)(2)(C), (G), and (J) (Sections 110(a)(2)(C), (G), and (J))).[5] Based upon guidance from the USEPA on these sections, and the other required elements under 42 U.S.C. § 7410(a)(2) listed in Table 1.1, this certification document ("Certification") discusses the sections that the USEPA published findings for in October 2008 and Section 110(a)(2)(D) that addresses interstate transport. The other required elements listed in Table 1.1 are discussed in Appendix A.

A. Background on Infrastructure Elements of 42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

On September 21, 2006, the USEPA promulgated a revised Particulate Matter (PM) NAAQS, which became effective December 18, 2006.[6] This revised standard did not result in any changes to the annual $PM_{2.5}$ standard (15.0 µg/m^3) established in 1997, but resulted in a 24-hour standard change from 65 µg/m^3 to 35 µg/m^3. In New Jersey, the 35 µg/m^3 24-hour (2006) standard is more controlling or stringent than the annual standard, based on an evaluation of monitoring data. The revision of the 24-hour (2006) standards requires the states to submit revised Infrastructure/Transport SIPs by September 21, 2009.

On February 25, 2008, New Jersey submitted an Infrastructure SIP to the USEPA, which addressed the remaining requirements under Section 110(a)(1) and (2) for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS.[7] New Jersey's 2008 Infrastructure SIP revision followed the USEPA's 2007 guidance.[8] New Jersey fulfilled the interstate transport requirements of Section

[2] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[3] NJDEP. State Implementation Plan Revision for Meeting the Infrastructure Requirements of the Clean Air Act. New Jersey Department of Environmental Protection, February 2008. Other than the findings from the USEPA on October 22, 2008 (73 Fed. Reg. 62904), there has been no further action taken on this SIP revision.

[4] State of New Jersey Office of the Governor. Governor Signs Global Warming Response Act. Available at http://www.nj.gov/globalwarming/home/news/approved/070706.html. July 7, 2007.

[5] 73 Fed. Reg. 62904 (October 22, 2008).

[6] 71 Fed. Reg. 61144-233 (October 17, 2006).

[7] NJDEP. State Implementation Plan Revision for Meeting the Infrastructure Requirements of the Clean Air Act. New Jersey Department of Environmental Protection, February 2008. Other than the findings from the USEPA on October 22, 2008 (73 Fed. Reg. 62904), there has been no further action taken on this SIP revision.

[8] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 1997 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards," October 2, 2007.

110(a)(2)(D)(i) for the 1997 NAAQS, as allowed per the USEPA 2006 guidance,[9] through: 1) a letter sent to the USEPA Regional Administrator on December 22, 2006 stating the intention to submit an abbreviated Clean Air Interstate Rule (CAIR) SIP, but noting that the CAIR SIP was not enough to address New Jersey's interstate transport concerns (Appendix B); and 2) the submission of a CAIR SIP to the USEPA on June 26, 2007 that was subsequently approved by the USEPA on September 28, 2007.

On October 22, 2008, the USEPA published a "Finding of failure to submit specific elements of Section 110(a)(2), pertaining to the fine particulate matter (PM2.5) NAAQS" concluding that the State's Infrastructure SIP fails to address the following two elements:

- A plan "addressing section 110(a)(2)(C) and (J) pertaining to the Part C Prevention of Significant Deterioration (PSD) permit program," and

- "The contingency plan portion section 110(a)(2)(G) element concerning emergency powers and adequate contingency plans."[10]

On September 25, 2009, the USEPA released guidance for the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ standards (see Appendix C).[11]

This Infrastructure Certification addresses the elements summarized in Table 1.1, while specifically discussing the transport requirements under Section 110(a)(2)(D) for the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ NAAQS and the October 22, 2008 USEPA findings for the 1997 $PM_{2.5}$ NAAQS.

II. Infrastructure Elements of the Clean Air Act Under 42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

The infrastructure elements that are required under 42 U.S.C. § 7410(a)(2) (Section 110(a)(2)) are listed in Table 1.1. There has been no change in authority with respect to most of the infrastructure requirements, since the previous infrastructure SIP revision submitted in 2008. In its 2009 guidance, the USEPA acknowledges that a state's existing infrastructure SIP may be adequate to satisfy the all of the requirements under Section 110(a)(2). New Jersey certifies compliance with these elements through its existing SIP, and as described in this Certification. This Certification also is addressing the following sections:

- Enforcement and Stationary Source Permitting – Section 110(a)(2)(C);
- Interstate Transport – Section 110(a)(2)(D);

[9] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Sections 110(a)(2)(D)(i) for the 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards. United States Environmental Protection Agency," August 15, 2006.

[10] 73 Fed. Reg. 62904 (October 22, 2008).

[11] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

- Emergency Powers and Contingency Plans – Section 110(a)(2)(G); and
- Consultation, Public Notification, and Prevention of Significant Deterioration – Section 110(a)(2)(J).

The remaining sections listed in Table 1.1 have no changes from the NJDEP February 25, 2008 Infrastructure SIP (with the exception of minor administrative changes) and are discussed in Appendix A.

A. Enforcement and Stationary Source Permitting – 42 U.S.C. § 7410(a)(2)(C) (Section 110(a)(2)(C))

States are required under the Federal Clean Air Act to implement a program providing for enforcement of all SIP measures and the regulation of construction of new or modified stationary sources to meet PSD and nonattainment area new source review (NNSR) requirements. New source review (NSR) necessitates programs in nonattainment and attainment areas. PSD is required in attainment areas, while NNSR is required in nonattainment areas.

New Jersey has implemented enforcement and permitting programs that meet the Clean Air Act requirements. New Jersey's enforcement of all control measures, including the air permitting program for regulating stationary sources, is governed by the State's Air Pollution Control Act (N.J.S.A. 26:2C-19). New Jersey's enforcement and permitting programs operate under rules designated in N.J.A.C. 7:27 and N.J.A.C. 7:27A.

On October 22, 2008, the USEPA published a "Finding of failure to submit specific elements of Section 110(a)(2), pertaining to the fine particulate matter (PM2.5) NAAQS" concluding that the State's Infrastructure SIP fails to address a plan "addressing section 110(a)(2)(C) and (J) pertaining to the Part C Prevention of Significant Deterioration (PSD) permit program."[12]

On September 25, 2009, the USEPA published guidance on how states can meet the requirements for NSR and PSD programs pertaining to interstate transport under U.S.C. § 7410(a)(2)(D(i) (Section 110(a)(2)(D)(i)).[13]

All areas are currently required to have some form of preconstruction permitting program for $PM_{2.5}$.[14] With respect to the $PM_{2.5}$ standards, New Jersey has both attainment and nonattainment areas throughout the State, necessitating both PSD and NNSR programs for $PM_{2.5}$, respectively. This section explains the separate regulatory actions the USEPA has taken to implement these programs and how New Jersey plans to implement its programs for the $PM_{2.5}$ health-based standards.

[12] 73 Fed. Reg. 62904 (October 22, 2008).

[13] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[14] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

Federal Regulatory History on PSD and NSR for $PM_{2.5}$

On April 25, 2007, the USEPA finalized its implementation rule for the 1997 $PM_{2.5}$ NAAQS.[15] The USEPA decided to address NSR separately, so no final $PM_{2.5}$ requirements for the NSR program were included. Prior to the implementation of that rule, the USEPA issued interim guidance calling for use of coarse particulate matter (PM_{10}) as a surrogate for $PM_{2.5}$ in the PSD and NNSR programs until NSR rules were finalized.[16,17] Due to the lack of $PM_{2.5}$ NSR rules, PM_{10} was used as a surrogate in both attainment and nonattainment areas. Under the surrogate approach, compliance with applicable requirements for PM_{10} was assumed to satisfy $PM_{2.5}$ requirements.

On September 21, 2007, the USEPA proposed a rule on increments, significant impact levels (SILs), and significant monitoring concentrations (SMCs).[18] The proposal has not been finalized as of the time that this Certification was developed. The final rule is anticipated in the summer of 2010. Hence, it is not possible for states to finalize their PSD or NNSR programs for $PM_{2.5}$.

On May 16, 2008, the USEPA issued a portion of the NSR rule for $PM_{2.5}$.[19] That rule changed the Federal rule for PSD, Appendix S of 40 C.F.R. Part 51 for $PM_{2.5}$ nonattainment areas, and the Federal guidance for state PSD and NNSR SIPs. The May 16, 2008 rule was challenged.[20] The USEPA granted the petition for reconsideration on April 24, 2009 and stayed the grandfathering provision of the rule until June 1, 2010.[21] In the USEPA guidance issued on September 25, 2009, the deadline for adopting and submitting $PM_{2.5}$ SIPs for NSR/PSD is May 2011.[22]

The September 25, 2009 USEPA guidance also states that "all areas are currently required to have some form of pre-construction permitting program for $PM_{2.5}$. This program may include a transitional program or a program that conforms with the minimum requirements of EPA's May 2008 final rule on implementation of the NSR program for $PM_{2.5}$."[23] New Jersey relies on Appendix S as a transitional program as discussed below.

[15] 72 Fed. Reg. 20586-20667 (April 25, 2007).
[16] USEPA Memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Implementation of New Source Review Requirements in PM-2.5 Nonattainment Areas," April 5, 2005.
[17] USEPA Memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Interim Implementation of New Source Review for $PM_{2.5}$," October 23, 1997.
[18] 72 Fed. Reg. 54112-54156 (September 21, 2007).
[19] 73 Fed. Reg. 28321-28350 (May 16, 2008).
[20] NRDC filed petition for exemption for condensable particulate matter in applicability as well as BACT/LAER determinations. EJ filed for reconsideration.
[21] Proposed Rule at 74 Fed. Reg. 36427-36430 (July 23, 2009), Final Rule at 74 Fed. Reg. 48153-48156 (September 22, 2009).
[22] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).
[23] ibid.

New Jersey's PSD and NNSR Programs for $PM_{2.5}$

In absence of the USEPA final rule increments, SILs, and SMCs,[24] New Jersey developed interim permitting and modeling procedures for sources emitting $PM_{2.5}$ emissions. The interim procedures are not affected by the recent USEPA decision on $PM_{2.5}$ reconsideration and stay of the grandfathering provision. New Jersey's approach is more protective of health and the environment than the USEPA approach for two reasons. First, New Jersey's interim procedures require inclusion of both filterable and condensable $PM_{2.5}$ emissions in the air quality modeling evaluation. When $PM_{2.5}$ data are not available to provide for actual $PM_{2.5}$ data, the $PM_{2.5}$ emissions must be conservatively determined based on PM_{10}, including the condensable portion. Secondly, New Jersey's approach compares the conservative determination of $PM_{2.5}$ emissions (based on PM_{10}, including condensable particulate matter) to the $PM_{2.5}$ NAAQS and interim $PM_{2.5}$ SILs. New Jersey does not follow the USEPA's 1997 PM_{10} surrogate policy for $PM_{2.5}$, which compared PM_{10} impacts to the PM_{10} NAAQS and PM_{10} SILs. Hence, New Jersey's $PM_{2.5}$ NNSR procedures do not grandfather $PM_{2.5}$ emissions for either condensable $PM_{2.5}$ or compliance with the $PM_{2.5}$ NAAQS.

PSD Requirements in New Jersey's Attainment Counties:

For attainment areas implementing the Federal $PM_{2.5}$ PSD program through delegation, where the Federal government or a delegated state issues PSD permits, the $PM_{2.5}$ PSD rule changes published on May 16, 2008 became effective as of July 15, 2008. New Jersey is a PSD delegated state. According to that rule, the May 16, 2008 changes to the Federal rule for PSD for New Jersey's attainment counties implementing the Federal PSD program through delegation were effective as of July 15, 2008. The 2005 PM_{10} surrogate policy, therefore, no longer applied after July 15, 2008, to PSD permits. New Jersey's interim procedures for $PM_{2.5}$ for state permit requirements continue to ensure that the PSD permit is protective of air quality.

Nonattainment NSR (NNSR) Requirements in New Jersey's Nonattainment Counties:

Currently in New Jersey, the USEPA's Appendix S (40 C.F.R. Part 51) applies until New Jersey's NSR rules for $PM_{2.5}$ become effective, which is expected in 2012 or later depending upon the USEPA and court actions. The $PM_{2.5}$ NSR rule allows up to three (3) years for states to revise their regulations and SIP. New Jersey expects the three-year clock to be triggered once the USEPA takes final actions on its repeal and reconsideration of federal rules by adopting the remaining components of the Federal $PM_{2.5}$ NSR implementation rule, which is expected by the summer of 2010. New Jersey expects to develop NNSR rule strategies in 2010, propose a NNSR rule revision in 2011, and adopt a revised NNSR rule in 2012, or no later than three (3) years after the USEPA completes its rulemaking.

New Jersey also expects to adopt New Jersey specific PSD rules in the same timeframe. Currently, New Jersey implements most of the Federal PSD rules under a delegation agreement and will continue to do so until New Jersey PSD rules are effective. New Jersey certifies that it has a PSD program in place.

[24] 72 Fed. Reg. 54112-54156 (September 21, 2007).

B. Interstate Transport of Air Pollution and International Pollution Abatement – 42 U.S.C. § 7410(a)(2)(D) (Section 110(a)(2)(D))

i. Section 110(a)(2)(D)(i)

42 U.S.C. § 7410(a)(2)(D) (Section 110(a)(2)(D)) requires states to include provisions prohibiting any source or other type of emissions activity in one state from:

1) Contributing significantly to nonattainment of the NAAQS for areas in another state or interfere with the maintenance of the NAAQS in another state;
2) Interfere with measures required to meet the implementation plan for any other state related to PSD; or,
3) Interfere with measures required to meet the implementation plan for any other state related to Regional Haze and Visibility.

In order to address interstate pollution, New Jersey coordinates with the nearby states on regional control measures as part of planning organizations, such as the Ozone Transport Commission (OTC), Northeast States for Coordinated Air Use Management (NESCAUM), Mid-Atlantic/Northeast-Visibility Union (MANE-VU), and Mid-Atlantic Regional Air Management Association (MARAMA). New Jersey will continue to work regionally through these organizations.

To meet the interstate transport provisions for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS, the USEPA allowed the states to rely on the CAIR.[25] The U.S. Court of Appeals determined the CAIR does not meet this obligation and remanded the rule back to the USEPA.[26] As the USEPA works to develop a replacement rule for the CAIR, the states in the eastern United States have been working together to develop recommendations to the USEPA regarding the replacement rule, including the issues of upwind transport and addressing Section 110(a)(2)(D)(i). This effort is commonly referred to as the 'State Collaborative' (materials produced from this effort are included in Appendix D). On September 2, 2009, 17 states within the Ozone Transport Commission and the Lake Michigan Area Directors Consortium (LADCO) submitted a letter (see Appendix D) to the USEPA containing recommendations for the USEPA to consider as it develops the CAIR replacement rule. The recommendations follow through on the commitment made by these states in the March 9, 2009 Framework Document, contained in Appendix D, to work together to address the transport requirements of Section 110(a)(2)(D) of the Clean Air Act, and to attain the ozone and $PM_{2.5}$ NAAQS. Based on the State Collaborative work and past USEPA practice, New Jersey determines that a state significantly contributes to a downwind state if its contribution is one percent (1%) or greater of the applicable NAAQS. In this case, one percent (1%) of the 24-hour (2006) $PM_{2.5}$ NAAQS is 0.35 $\mu g/m^3$. In developing

[25] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Sections 110(a)(2)(D)(i) for the 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards. United States Environmental Protection Agency," August 15, 2006.

[26] The Federal CAIR program, as established in the Federal rules, was vacated by the U.S. Court of Appeals for the District of Columbia Circuit (the "Court") on July 11, 2008 (State of North Carolina v. Environmental Protection Agency, supra). On December 23, 2008, the Court remanded the CAIR to the USEPA without vacatur of CAIR "so that EPA may remedy CAIR's flaws in accordance with" the Court's July 2008 opinion vacating CAIR.

the CAIR, the USEPA used a similar threshold. New Jersey uses a weight-of-evidence approach combining several analyses to determine significant contributions. The following discussion is a summary of Appendix E.

1) New Jersey's Significant Contributions to Other States

a) Contributing Significantly to a Nonattainment Area or Interference with the Maintenance of the NAAQS in Another State

According to the USEPA's 2009 guidance,[27] a state's conclusion regarding its impact on nonattainment and maintenance of the NAAQS in any other state must be supported by "adequate technical analysis." In order to assess New Jersey's significant contributions to the downwind nonattainment and maintenance areas of the 24-hour $PM_{2.5}$ NAAQS in other states, New Jersey utilizes a weight-of-evidence approach, using the best data available. Table 1.2 provides a summary of the results of the modeling analyses used in this approach and New Jersey's determination of significant contribution to interstate transport by New Jersey sources.

While the methods analyzed did not identify Delaware as a state that New Jersey impacts, the methods did identify all of the states surrounding Delaware. Hence, New Jersey includes Delaware among the other states to which New Jersey significantly contributes. In addition, a review of ambient air quality monitoring data was used in the determination of significant contributions to other states, as discussed in Appendix E. The weight-of-evidence approach indicates New Jersey significantly contributes to Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, and Pennsylvania, as shown in Table 1.2 and Figure 1.1. The details of the analyses are in Appendix E.

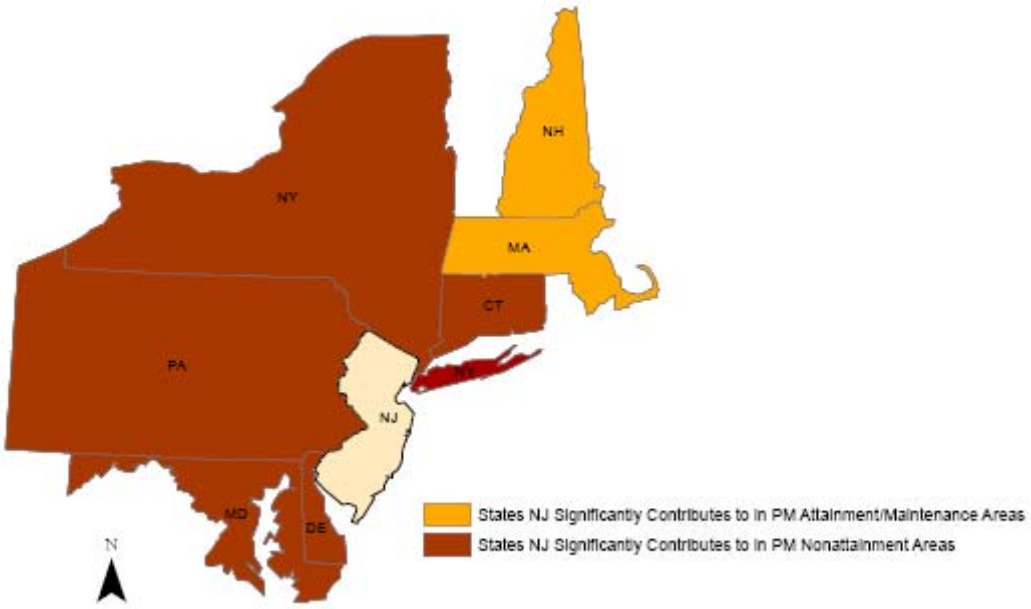
Table 1.2: Summary of New Jersey's Significant Contributions to Other States' Fine Particulate Matter Concentrations

Analysis	$PM_{2.5}$ CAIR Modeling		8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling	Significant Contribution? (Y/N)
State(s)	**NJ Only**	**NJ+DE**	**NJ Only**	**NJ Only**	**NJ Only**	**NJ Only**	
Connecticut			x	x		x	Y
Delaware							Y
Maryland						x	Y
Massachusetts				x			Y
New Hampshire				x			Y
New York		x	x	x		x	Y
Pennsylvania			x	x		x	Y

1. The regional haze analyses concluded that New Jersey did not significantly impact any of the other states with Class I areas analyzed in the study.

[27] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle (PM2.5) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

Figure 1.1: States to which New Jersey Significantly Contributes with respect to Fine Particulate Concentrations based upon a Weight-of-Evidence Approach



b) Interference with Measures Required to Meet the Implementation Plan for Any Other State Related to Prevention of Significant Deterioration (PSD)

The previous subsection summarizes the states New Jersey significantly impacts related to attainment and maintenance of the $PM_{2.5}$ NAAQS. 42 U.S.C. § 7410(a)(2)(D)(i)(II) (Section 110(a)(2)(D)(i)(II)) also requires protections to prevent further degradation of attainment and maintenance areas. According to the USEPA's 2009 guidance, "this requirement is satisfied for $PM_{2.5}$ if a state's SIP includes preconstruction review programs for major sources that satisfy the requirements of 40 C.F.R. 51.165(b)(1) and 40 C.F.R. 51.166" (NSR and PSD, respectively).[28] The USEPA guidance also states, "Unless the area has known outstanding permit program deficiencies, it is not necessary, at this time, for states to make a SIP submission containing rule changes specifically to address section 110(a)(2)(D)(i)(II) for the 2006 24-hour $PM_{2.5}$ NAAQS. If this is the case, the state can submit an appropriate certification as described previously in this guidance."[29] In addition, notwithstanding the absence of PSD increments for $PM_{2.5}$, the USEPA believes that states may continue to rely upon their existing PSD and NNSR permitting programs to prevent significant deterioration of air quality within their own boundaries and in adjacent

[28] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle (PM2.5) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).
[29] ibid.

states until such increments are established. New Jersey's existing PSD and NSR programs and subsequent revisions provide and will continue to provide these protections for new or modified sources. The details of these programs are discussed in Section A. New Jersey certifies that it has a PSD program in place.

c) Interference with Measures Required to Meet the Implementation Plan for Any Other State Related to Regional Haze and Visibility

42 U.S.C. § 7410(a)(2)(D)(i)(II) (Section 110(a)(2)(D)(i)(II)) requires protections to protect visibility. According to the USEPA's 2009 guidance, this requirement consists of two phases of visibility protection, i.e., reasonably attributable visibility impairment (RAVI) (Phase 1) and regional haze (Phase 2).[30] RAVI is visibility impairment attributable to a single source/small group of sources and regional haze is impairment from a multitude of sources over a large area. New Jersey's Regional Haze SIP[31] addresses both regional haze and RAVI. The following discussion provides an explanation of how New Jersey is meeting these requirements.

Reasonably Attributable Visibility Impairment (RAVI)

Under the 1980 Federal regulations, currently at 40 C.F.R. 51.300-51.307, New Jersey was included in the 35 states that were required to submit SIPs to address RAVI at 40 C.F.R. 51.300(b)(2). At 40 C.F.R. 52.1606, New Jersey is under a Federal Implementation Plan (FIP) for visibility monitoring (requirement at 40 C.F.R. 51.305 and provisions at 40 C.F.R. 52.26), New Source Review (requirement at 40 C.F.R. 51.307 and provisions at 40 C.F.R. 52.28), and a long-term strategy (provisions at 40 C.F.R. 52.29). New Jersey has addressed these components in its Regional Haze SIP.[32] This document outlines New Jersey's long-term plan (2018) for addressing visibility-impairing air pollution within its borders and from out-of-state sources that impact New Jersey's Federally protected visibility area or Class I area, the Brigantine Wilderness Area. The following section from the Regional Haze SIP addresses the RAVI requirement:

> ***10.2 Other Commitments***
> ***10.2.1 Visibility***
> *New Jersey commits to continue carrying out the required review of proposed sources impact on visibility under 40 C.F.R. § 52.26 and 52.28, by implementing the Prevention of Significant Deterioration (PSD) permit requirements for new or modified major sources of air pollutants located within 100 kilometers of the Class I area, or within a larger radius on a case-by-case basis, in accordance with all applicable Federal rules for review of the impacts on Class I areas.*
>
> *New Jersey's PSD program prevents new and modified sources from significantly*

[30] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[31] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

[32] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

impacting visibility. The PSD program includes a requirement that evaluates the new source's visibility impact on any nearby Class I areas (Brigantine in New Jersey's case). In some cases, the Federal Land Manager may exempt smaller, more distant PSD sources from having to do the visibility analysis, but the larger sources with the greatest chance of adversely impacting visibility at Brigantine will have to address the issue. In addition, older sources are expected to shut down with time, and new source emissions are minimized, thereby improving air quality and enhancing visibility at Brigantine.

The Federal Land Manager is expected to finalize guidance for determining whether a PSD source addresses visibility impacts in mid 2010. This will be part of a new guidance document known as Federal Land Managers' Air Quality Related Values Work Group 2 (FLAG 2). There will be an equation that adds the total NO_x, SO_2, sulfuric acid mix, and PM10 emissions in tons per year, and then divides by the distance to the Class I area in kilometers (km). If the result is greater than 10, a visibility analysis must be done. The non-PSD sources will be reviewed on a case by case basis depending on the emissions and the distance.

10.2.2 Consultation with Federal Land Managers

New Jersey commits to coordinate on-going consultation with the appropriate Federal Land Manager and the USEPA regarding future progress reports and State plan revisions.

New Jersey certifies that no source within the State emits pollutants that interfere with RAVI measures included in the applicable implementation plan of another state.

Regional Haze

New Jersey is meeting the regional haze requirement through its Regional Haze SIP. The latest revision was submitted to the USEPA on July 29, 2009.[33] As discussed in Appendix E, the contribution assessment performed for the Regional Haze SIP concluded that New Jersey does not significantly contribute to visibility impairment, based on sulfate impacts at the Class I areas in Maine, New Hampshire, Vermont, West Virginia, and Virginia.[34] Maine, New Hampshire, and Vermont included New Jersey as a contributing state in their Regional Haze SIPs, based on an agreement that all MANE-VU states would be included as impacting MANE-VU Class I areas.[35,36,37]

[33] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.
[34] Refer to the "Regional Haze Modeling Analysis" section for more details.
[35] Maine's regional haze SIP is not yet available but electronic communication with Maine supports that New Jersey does not significantly contribute to its Class I Areas.
[36] NHDES. New Hampshire Regional Haze SIP Revision, Final Draft. New Hampshire Department of Environmental Services, November 3, 2008.
[37] VTDEC. Vermont State Implementation Plan (SIP) Revision Regional Haze, Draft. State of Vermont, Department of Environmental Conservation (DEC), January 15, 2009.

d) New Jersey's Remedy to its $PM_{2.5}$ Interstate Contributions

New Jersey has taken a number of recent actions as well as measures that have been in place for many years to address its contribution to downwind areas. Table 1.3 lists New Jersey's recently adopted control measures that reduce $PM_{2.5}$, sulfur dioxide (SO_2), oxides of nitrogen (NO_x), and volatile organic compound (VOC) emissions.[38] Some of these SIP measures are approved by the USEPA, as listed in 40 C.F.R. Part 52, Subpart FF, while other measures are pending approval by the USEPA.

Table 1.3: New Jersey's Recently Adopted Control Measures to Reduce Emissions of $PM_{2.5}$ and its Precursors

Measure	Pollutant Reduced			
	$PM_{2.5}$	SO_2	NO_x	VOC*
Boilers Serving Electric Generating Units (EGUs) (Coal)	x	x	x	
Boilers Serving EGUs (Oil and Gas)			x	
CAIR/NO_x Budget		x	x	
Refinery Consent Decrees	x	x	x	x
PSEG-Consent Decree	x	x	x	
Asphalt Production			x	
NO_x Reasonably Available Control Technology) (RACT) Rule (2006)			x	
Industrial/Commercial/Institutional Boilers (2009)			x	
Glass Manufacturing			x	
Municipal Waste Combustor NO_x rule			x	
Case by Case NO_x (Facility-Specific Emission Limits (FSELs)/Alternative Emission Limits (AELs))			x	
High Electrical Demand Day (HEDD)			x	
Sewage sludge incinerators			x	
On-board Diagnostics (OBD) I/M			x	
Diesel Vehicle Idling	x		x	
Diesel Vehicle Inspection and Maintenance (I/M)	x		x	
Diesel Vehicle Retrofit Program	x			
Architectural Coatings 2005				x
Portable Fuel Containers 2005				x
Consumer Products 2005				x
Consumer Products 2009				x
Portable Fuel Containers 2009				x
Adhesives & Sealants				x
Petroleum Storage				x
Case by Case VOC (AELs)				x
Asphalt Paving (cutback and emulsified)				x

[38] Although the USEPA does not consider VOC as a $PM_{2.5}$ precursor for SIP and conformity purposes, New Jersey anticipates a $PM_{2.5}$ benefit from the implementation of these measures.

Measure	Pollutant Reduced			
	$PM_{2.5}$	SO_2	NO_x	VOC*
Group 1: Printing				x
Energy Master Plan	x	x	x	x
Mercury Rule	x	x	x	

* Although the USEPA does not consider VOC as a $PM_{2.5}$ precursor for SIP and conformity purposes, New Jersey anticipates some $PM_{2.5}$ benefit from the implementation of these measures. New Jersey has not quantified this benefit and is including the VOC measures in this list for informational purposes.

New Jersey is also proposing or evaluating additional measures that would reduce $PM_{2.5}$ emissions. These are summarized in Table 1.4.

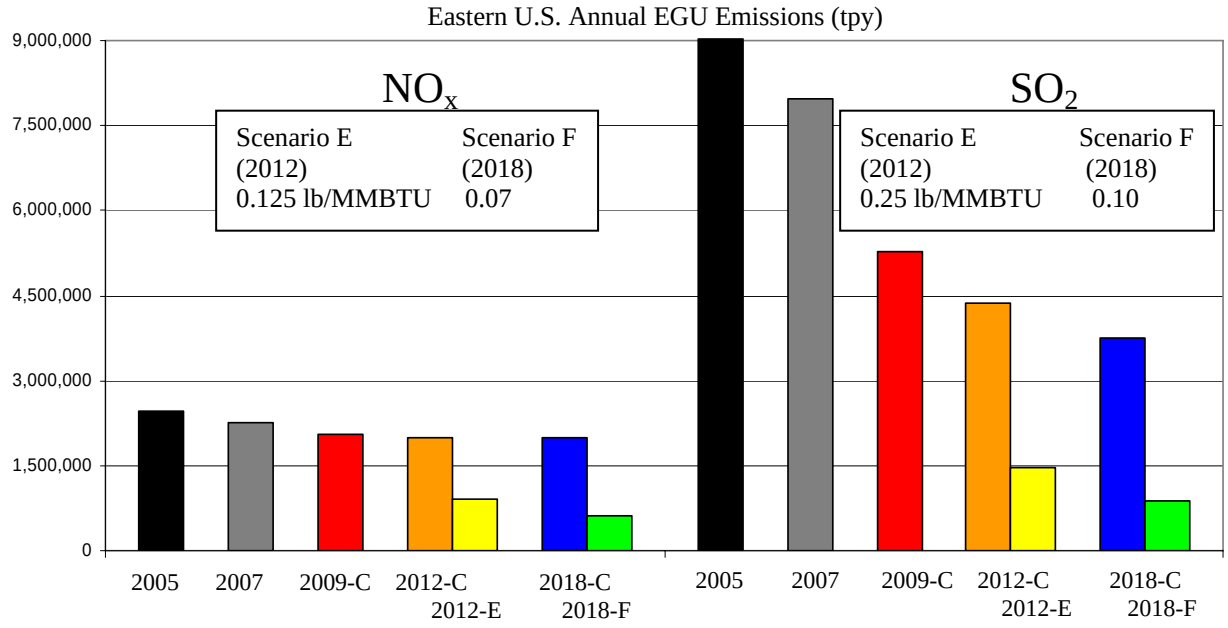
Table 1.4: Control Measures under Evaluation

Measure	Current Status of Measure
Low sulfur distillate and residual fuel strategies	Proposed 11/16/2009 (41 N.J.R. 4156(a)), Implementation in 2014 with 2016 as Phase 2
Fugitive Dust at Stationary Sources	Analysis underway
Open Burning Permit Revisions	Analysis underway
#6 Fuel Oil-Fired Boilers	To be evaluated
Stationary Diesel Engines	To be evaluated
Residential Wood Burning Strategies	To be evaluated
Greenhouse Gas Reduction Plan	Proposed
Refineries	Analysis underway

As part of its evaluation of potential control measures, New Jersey worked with other states in the OTC and LADCO and reached a consensus through the State Collaborative on recommendations to the USEPA on a framework that the USEPA should follow to develop a replacement rule for the CAIR (see Appendix D). This framework included potential controls not only for national rules involving significantly contributing states that combine statewide emission caps and complementary regional trading programs but support for a Federal program that also requires substantial regional emission reductions from mobile and area sources. Quantitative analyses performed showed that New Jersey could reduce its impact if controls are applied to EGUs. In one of the assessments conducted by the OTC, applying EGU emission control rates of 0.07 pounds per million British Thermal Units (lb/mmBTU) for NO_x and 0.15 lb/mmBTU for SO_2 in New Jersey would reduce emissions by 27 percent (%) (2,483 tons) and 33 percent (%) (6,934 tons) for 2008, respectively (see Appendix D, "OTC CAIR Replacement Rule Recommendation Technical Support Document"). Using that assessment as a guide to determine what EGU emission control rates to recommend, similar rates were modeled for 2012 and 2018, as shown in Figure 1.2. Figure 1.3 shows the improvement in daily $PM_{2.5}$ concentrations across the region for 2012. Figure 1.4 shows that only five (5) counties in the Northeast, including counties in New Jersey, are not attaining the daily $PM_{2.5}$ standard in 2012. Thus, the regional modeling performed shows that an EGU-based strategy would have a positive impact on $PM_{2.5}$ air quality in the region and that while nearby sources have the greatest impact, significant contribution to levels of $PM_{2.5}$ can come from states several hundred miles away. This modeling demonstrates that New Jersey would reduce its daily $PM_{2.5}$ significant

contributions through a future EGU-based control strategy prior to the expected attainment date of 2014 for the 35 µg/m^3 daily $PM_{2.5}$ NAAQS. This control strategy proposal is similar to performance standards adopted by New Jersey on March 20, 2009,[39] which will be effective by December 2012. New Jersey's emission rate for SO_2 is as stringent as modeled. The NO_x emission rates are comparable to the rate modeled, i.e., 0.125 lb/mmBTU, depending upon the averaging times relevant for the model. Thus, the estimated EGU reductions from the rule are anticipated to be similar to the reductions assumed in the modeling scenario described above.

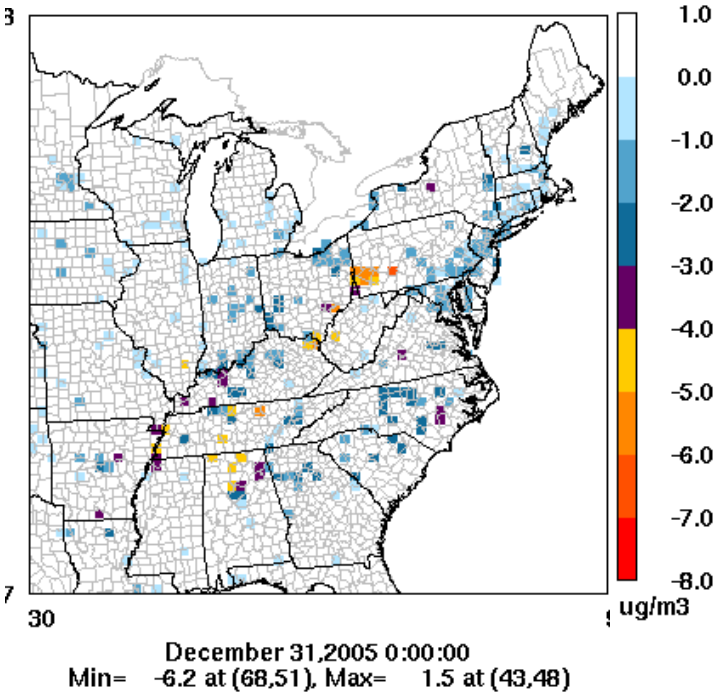
Figure 1.2: Modeled EGU Emission Control Rates by the State Collaborative*



* Refer to Appendix D for more details.

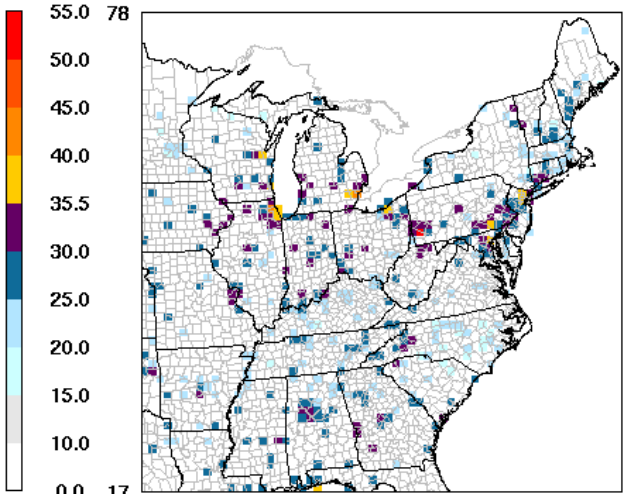
[39] Adopted Rules Published in NJ Register - 41 N.J.R. 1752(a).

Figure 1.3: Daily $PM_{2.5}$ Air Quality Improvement for 2012*



*Refer to Appendix D for more details.

Figure 1.4: Daily $PM_{2.5}$ Concentrations in 2012*



* Refer to Appendix D for more details.

New Jersey is complying with the Federal Clean Air Act's requirements regarding interstate transport as it relates to the $PM_{2.5}$ NAAQS and is doing more to ensure that it is not interfering with the ability of its neighboring states to attain and maintain that standard or visibility goals. While many of New Jersey's existing control measures listed in Tables 1.5 and 1.6 are already

more stringent than the existing pollution control requirements in many neighboring states, New Jersey will consider any additional measures, which will be implemented by the neighboring upwind and downwind states, if they would provide additional emission reductions.

The control measures implemented in New Jersey address its contributions to the downwind areas, ensuring that its sources' emissions do not interfere with the attainment or maintenance of the 24-hour $PM_{2.5}$ NAAQS or measures that prevent significant deterioration and protect visibility in another state. New Jersey expects the other significantly contributing states to the downwind areas of interest to timely implement reasonable measures, including measures similar to New Jersey's, to address their contributions and to help bring the areas into attainment of the $PM_{2.5}$ NAAQS, preserving the maintenance of the standard, and meeting visibility goals.

2) Other States' Significant Impacts on New Jersey

Applying the same weight-of-evidence approach, the states in Table 1.5 significantly contribute to New Jersey's $PM_{2.5}$ nonattainment in its thirteen (13) counties designated as not attaining the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS and interfere with the maintenance of attainment in the remaining eight (8) counties. The details of this analysis are in Appendix E.

Table 1.5: Summary of Significant Contributions from Other States' to New Jersey's Fine Particulate Matter Nonattainment and Maintenance

Analysis	$PM_{2.5}$ CAIR Modeling	8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling	Significant Contribution? (Y/N)
State(s)/Area(s)	**NJ Only**	**NJ Only**	**NJ Only**	**NJ Only**	**NNJ/NY/CT[2]**	
Canada					x	Y
CENRAP[3]_WRAP[4]_South					x	Y
Connecticut					x (combined with Rhode Island)	Y
Delaware		x	x	x	x	Y
District of Columbia			x			Y
Georgia				x		Y
Illinois			x	x	x	Y
Indiana			x	x	x	Y
Kentucky			x	x	x	Y
Maryland	x (combined with D.C.)	x (combined with D.C.)	x	x	x (combined with D.C.)	Y
Massachusetts					x	Y
Michigan	x	x	x	x	x	Y
New York	x	x	x	x	x	Y
North Carolina			x	x	x	Y
Ohio	x	x	x	x	x	Y
Pennsylvania	x	x	x	x	x	Y
South Carolina				x		Y
Tennessee				x		Y
Virginia	x	x	x	x	x	Y
West Virginia	x	x	x	x	x	Y

1. Contributing states included those with a sulfate contribution >2%; Illinois and New York are also included based upon other modeling techniques (see New Jersey's Regional Haze SIP).
2. Northern New Jersey/New York/Connecticut nonattainment area
3. CENRAP = Central Regional Air Planning Association. CENRAP is an organization of states, tribes, federal agencies. The states included are Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana.
4. WRAP = Western Regional Air Partnership. The WRAP is made up of western states, tribes, and federal agencies. The states are Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

New Jersey requests that the USEPA, when it evaluates the SIPs from these states, ensure that they are not hindering the attainment and maintenance of the $PM_{2.5}$ NAAQS in New Jersey or in the multi-state nonattainment areas. With regard to regional haze, New Jersey expects that the USEPA and the Federal Land Managers (FLMs) will monitor and ensure the emission reductions from the contributing states to achieve the 2018 reasonable progress goals set for the Brigantine Wilderness Area. As discussed in detail in Appendix D, New Jersey requests that the USEPA consider recommendations made by the State Collaborative and the OTC as the USEPA develops a replacement rule for the CAIR.

ii. Section 110(a)(2)(D)(ii)

Section 110(a)(2)(D)(ii) of the Clean Air Act ensures compliance with the applicable requirements of 42 U.S.C. § 7426 (Section 126) and 42 U.S.C. § 7415 (Section 115) (relating to interstate and international pollution abatement, respectively).

Section 126 of the Clean Air Act

Section 126(a) requires each SIP to require that all major sources (new or modified) provide written notice to all surrounding states regarding the source's impact on air pollution levels at least 60 days prior to commencement of construction. Those sources must also identify major existing stationary sources that would also impact air pollution levels. The sources subject to this requirement are those major sources subject to Part C of the Clean Air Act and those that contribute to pollution levels in areas above the NAAQS.

New Jersey sends communications to all the surrounding states regarding all Title V operating permit actions: Maryland, Pennsylvania, Delaware, New York, and Connecticut, in accordance with N.J.A.C. 7:27-22.11(k).

Section 115 of the Clean Air Act

Section 115 of the Clean Air Act requires that states revise their SIPs in the case that pollutants emitted from the state endanger public health or welfare in a foreign country.

In the case that the USEPA makes a finding that a state's plan is inadequate under Section 126(a)(2)(H)(ii) of the Clean Air Act in response to an international agency's reports, surveys, or studies, Section 115(b) of the Clean Air Act requires the applicable state plan be revised to reduce the pollution endangering public health or welfare in a foreign country. New Jersey has the authority to revise its SIP under N.J.A.C. 26:2C-8.11 and conduct any further research as needed under N.J.A.C. 26:2C-9.

Modeling performed by the State Collaborative, as discussed in Section D(i) of this Certification, demonstrated that emission sources in Canada impact the air quality in New Jersey (see Table 1.5). New Jersey's impacts on Canada were not assessed. Even though New Jersey does not anticipate that its emissions significantly impact any foreign country, New Jersey will revise its SIP accordingly and protect the public health and welfare in foreign countries should the State receive such a notification.

C. Emergency Powers and Contingency Plans – 42 U.S.C. § 7410(a)(2)(G) (Section 110(a)(2)(G))

States are to provide for authority comparable to that in Section 303 of the Clean Air Act, which provides legal authority to halt the emission of air pollutants causing or contributing to injury to public or welfare. In addition, states are to provide for adequate contingency plans to implement such authority.

This authority is provided in New Jersey's Air Pollution Emergency Control Act (N.J.S.A. 26:2C-26 et seq.), which is implemented through New Jersey's rules at N.J.A.C. 7:27-12. New Jersey's emergency episode plans/contingency plans are contained in New Jersey's rules at N.J.A.C. 7:27-12, which are consistent with the USEPA's regulations at 40 C.F.R. Part 51, Subpart H, and the example rule in Appendix L.

On October 22, 2008, the USEPA published a "Finding of failure to submit specific elements of Section 110(a)(2), pertaining to the fine particulate matter (PM2.5) NAAQS" concluding that the State's Infrastructure SIP "fails to address the contingency plan portion of section 110(a)(2)(G) element concerning emergency powers and adequate contingency plans."[40] This appears to be an error as discussed below.

According to 40 C.F.R. 51.150, New Jersey is classified as a Priority III region for particulate matter because its ambient air concentrations for particulate matter do not meet the criteria for a Priority I (95 µg/m^3 annual geometric mean; 325 µg/m^3 24-hour maximum) or II (60–95 µg/m^3 annual geometric mean; 150–325 µg/m^3 24-hour maximum) region. According to 40 C.F.R. 51.152(c) "Areas classified Priority III do not need to develop episode plans" for $PM_{2.5}$. Also, New Jersey has rules at N.J.A.C. 7:27-12 for emergency episodes for particulate matter.

According to the USEPA's 2009 guidance, New Jersey is not required to establish a contingency plan at this time, given that the existing monitored levels of 24-hour $PM_{2.5}$ have not exceeded 140.4 µg/m^3 since 2006.[41] The USEPA is also using these conditions to resolve the finding of failure to submit issued for the annual (1997) $PM_{2.5}$ NAAQS (see Appendix C). Quality-assured ambient air quality data available in the Air Quality System (AQS) indicate that New Jersey's 24-hour $PM_{2.5}$ concentrations do not come close to 140.4 µg/m^3. A review of the ambient air quality data from 2006-2008 shows that most of the highest 24-hour $PM_{2.5}$ concentrations recorded in New Jersey typically range from 40-59 µg/m^3, with a maximum value of 91.0 µg/m^3 recorded in 2006 in Atlantic City. Recognizing that single episodes may cause significantly higher concentrations, a review of the ambient air quality monitored during the 2002 Canadian forest fires (northern Quebec) shows that even during this extreme event the maximum 24-hour $PM_{2.5}$ concentration reached 106.7 µg/m^3, which is well below 140.6 µg/m^3. Since New Jersey never exceeded 140.4 µg/m^3 since 2006, New Jersey certifies that it has the appropriate authority

[40] 73 Fed. Reg. 62904 (October 22, 2008).

[41] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

to address $PM_{2.5}$ related episodes, and that no specific emergency episode plans are necessary at this time, given existing monitored levels.

D. Consultation, Public Notification, and Prevention of Significant Deterioration – 42 U.S.C. § 7410(a)(2)(J) (Section 110(a)(2)(J))

States are required to meet the applicable requirements of Clean Air Act Section 121 (relating to consultation), Section 127 (relating to public notification), and Part C (relating to prevention of significant deterioration of air quality and visibility protection).

i. Consultation and Public Notification

States are required to meet the applicable requirements of Clean Air Act Section 121 (relating to consultation), Section 127 (relating to public notification), and Part C (relating to prevention of significant deterioration of air quality and visibility protection).

Clean Air Act Section 121 requires that states provide a satisfactory process of consultation with general purpose local governments, designated organizations of elected officials of local governments, and any affected federal land manager in carrying out the Clean Air Act requirements. New Jersey provides the opportunity to the public to participate in the public comment period and public hearing for rulemaking and SIP proposals, in accordance with applicable rules and regulations, as described in Section M (see Appendix A). Another avenue of consultation with the public and the regulated community is through workshops. In preparation for the attainment demonstration SIP revisions for the 85 parts per billion (ppb) 8-hour ozone and 15 $\mu g/m^3$ annual $PM_{2.5}$, New Jersey consulted with representatives of civic, environmental, and industrial groups, as well as other interested parties through the ongoing Reducing Air Pollution Together Initiative that began with a workshop on June 29, 2005 and the formation of the six air quality workgroups. The public had an opportunity to provide feedback on the workshop and on white papers on various control options drafted by New Jersey (This initiative is further discussed at http://www.nj.gov/dep/baqp/rapt/rapt.html).

In addition, New Jersey met with the federal land manager, regional organizations, and affected states for the purpose of the Regional Haze SIP.[42] Also, New Jersey consults with the Metropolitan Planning Organizations regularly to discuss transportation-related air quality issues as required by the Transportation Conformity Rule.

Clean Air Act Section 127 requires the states to provide measures which will be effective to notify the public on a regular basis of instances or areas in which any air quality standard is exceeded during the preceding calendar year, to advise the public of the health hazards associated with such pollution, and to enhance public awareness of measures that can be taken to prevent such standards from being exceeded. New Jersey has a standard operating procedure by which notification of NAAQS exceedances is sent to the news media. Additionally, the notification of NAAQS exceedances is posted on the State's website (http://www.nj.gov/dep). The State's website also contains information for the public on the health hazards associated with

[42] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

such pollution and measures that can be taken to help prevent such standards from being exceeded. When an exceedance or unhealthy air is forecasted, the information is also sent out to participants of the State's Air Advisory listserv, an e-mail service that is used to broadcast information. New Jersey certifies compliance with this element.

ii. Prevention of Significant Deterioration

On October 22, 2008, the USEPA published a "Finding of failure to submit specific elements of Section 110(a)(2), pertaining to the fine particulate matter (PM2.5) NAAQS" concluding that the State's Infrastructure SIP fails to address a plan "addressing section 110(a)(2)(C) and (J) pertaining to the Part C Prevention of Significant Deterioration (PSD) permit program."[43]

The PSD program and the finding are discussed in Section C of this Certification. New Jersey certifies that it has a PSD program in place. For visibility improvement, New Jersey included all the necessary requirements in its recent Regional Haze SIP.[44]

III. Conclusion

Regarding the Part C PSD permit program for $PM_{2.5}$, in absence of the USEPA final rule $PM_{2.5}$ increments, significant impact levels (SILs), and significant monitoring concentrations (SMCs),[45] at the time of this Certification, New Jersey is implementing its own interim permitting and modeling procedures for sources emitting $PM_{2.5}$ emissions. The interim procedures require inclusion of both filterable and condensable $PM_{2.5}$ emissions in the air quality modeling evaluation and compares the conservative determination of $PM_{2.5}$ emissions (based on PM_{10}, including condensable particulate matter) to the $PM_{2.5}$ NAAQS. New Jersey does not follow the USEPA's 1997 PM_{10} surrogate policy for $PM_{2.5}$. New Jersey's approach is more protective of health and the environment than the interim Federal approach.

New Jersey is complying with the USEPA's requirements regarding interstate transport as it relates to the $PM_{2.5}$ NAAQS and is not interfering with the ability of its neighboring states to attain and maintain that standard. In order to assess the State's significant contributions to the downwind nonattainment or maintenance areas of the 24-hour $PM_{2.5}$ NAAQS, New Jersey utilizes a weight-of-evidence approach using the best data available. This analysis indicates that New Jersey significantly contributes to the $PM_{2.5}$ concentrations in Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, and Pennsylvania.

New Jersey has taken a number of recent actions, as well as measures that have been in place for many years to address its contribution to transport. With these actions, New Jersey is confident that it is adequately addressing its contribution to the downwind areas.

[43] 73 Fed. Reg. 62904 (October 22, 2008).
[44] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.
[45] 72 Fed. Reg. 54112-54156 (September 21, 2007).

New Jersey is also proposing or evaluating additional measures that would further reduce $PM_{2.5}$ emissions. New Jersey will consider any additional measures, implemented by the neighboring upwind and downwind states, if they would provide additional emission reductions in the State.

New Jersey applied the same weight-of-evidence approach used in its significant contribution analysis to determine other states' contributions to New Jersey. Nineteen (19) states identified by applying this method significantly contribute to the State's $PM_{2.5}$ nonattainment in its thirteen (13) counties designated as not attaining the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS and interfere with the maintenance of attainment in the remaining eight (8) counties.

New Jersey is meeting the contingency plan portion of section 110(a)(2)(G) element concerning emergency powers and adequate contingency plans according to 40 C.F.R. 51.150 and Federal guidance. According to the USEPA's 2009 guidance, New Jersey is not required to have a contingency plan at this time, given that the existing monitored levels of 24-hour $PM_{2.5}$ have not exceeded 140.4 $\mu g/m^3$ since 2006; however, New Jersey has rules at N.J.A.C. 7:27-12 for emergency episodes for particulate matter. The USEPA is also using these conditions to resolve the finding of failure to submit issued for the annual (1997) $PM_{2.5}$ NAAQS.

Through this Certification, the State of New Jersey is demonstrating that the infrastructure and transport requirements for the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS have been satisfied.

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

Appendix A: Infrastructure Elements Not Including Sections 110(a)(2)(C), (D), (G), or (J)

January 2010

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Acronyms and Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
CAIR	Clean Air Interstate Rule
FIP	Federal Implementation Plan
MARAMA	Mid-Atlantic Regional Air Management Association
NAAQS	National Ambient Air Quality Standards
NESCAUM	Northeast States for Coordinated Air Use Management
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
N.J.S.A.	New Jersey Statutes Annotated
NO_x	Oxides of Nitrogen
OTC	Ozone Transport Commission
PM	Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
ppm	Parts per million
PSD	Prevention of Significant Deterioration
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency

I. Introduction

The purpose of this Certification appendix is to discuss the infrastructure elements required under 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2)) for the 35 µg/m^3 24-hour (2006) Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS) that remained consistent with New Jersey's 2008 Infrastructure SIP revision.[1] Administrative changes to these sections are minor and entail clarifications from the 2008 SIP revision. The elements discussed in this appendix do not include 42 U.S.C. § 7410(a)(2)(C), (D), (G), or (J) (Sections 110(a)(2)(C), (D), (G), or (J)), as they are addressed in the main document.

A. Background on Infrastructure Elements of 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2))

On July 18, 1997, the United States Environmental Protection Agency (USEPA) promulgated revised and new NAAQS for ozone and $PM_{2.5}$, respectively. For ozone, the USEPA revised the NAAQS to 0.08 parts per million (ppm) with an 8-hour averaging period (versus the 0.12 ppm standard with a 1-hour averaging period for the pre-existing NAAQS).[2] The USEPA also promulgated new 24-hour and new annual NAAQS for fine particulate matter ($PM_{2.5}$ or particles with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers) of 65 micrograms per cubic meter (µg/m^3) and 15 µg/m^3, respectively.[3,4]

For every new or revised NAAQS, the Federal Clean Air Act requires the states demonstrate the ability to implement, maintain, and enforce that standard.[5] By Federal statute, State Implementation Plans (SIPs) meeting the requirements of Section 110(a)(1) and (2) are to be submitted by states within three (3) years after promulgation of a new or revised standard. This being the case, states were required to submit such SIPs for the 1997 standards to the USEPA no later than July 2000. However, intervening litigation over the 1997 8-Hour Ozone and $PM_{2.5}$ NAAQS created uncertainty about how to proceed and states did not submit SIPs to meet the infrastructure requirements enumerated in Section 110(a)(1) and (2).

In March of 2004, Earth Justice initiated a lawsuit against the USEPA for failure to take action against states that had not made revisions to their SIPs to meet the requirement of Section 110(a)(1) and (2), i.e., failure to make a "finding of failure to submit." On March 10, 2005, the USEPA entered into a Consent Decree with Earth Justice that obligated the USEPA to make official findings whether states had made required implementation plan submissions by dates

[1] NJDEP. State Implementation Plan Revision for Meeting the Infrastructure Requirements of the Clean Air Act. New Jersey Department of Environmental Protection, February 2008. Other than the findings from the USEPA on October 22, 2008 (73 Fed. Reg. 62904), there has been no further action taken on this SIP revision.

[2] 62 Fed. Reg. 38855-38896 (July 18, 1997).

[3] 62 Fed. Reg. 38652-38760 (July 18, 1997).

[4] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 1997 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards," October 2, 2007.

[5] Under 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2)), all states are required to submit plans to demonstrate states' ability and authority to implement, maintain, and enforce the 8-hour ozone and fine particulate matter standards. Under Section 110(a)(1) and (2) states are required to address basic state implementation plan requirements, including emissions inventories, monitoring, and modeling to assure attainment and maintenance of the standards.

certain. The Consent Decree obligated the USEPA to determine whether states have made SIP submissions required to meet Section 110(a)(1) and (2) related to interstate transport by no later than March 15, 2005. The Consent Decree also obligated the USEPA to make a determination whether states have made submissions necessary to meet the remaining requirements under Section 110(a)(1) and (2) by December 15, 2007, for the 1997 8-Hour Ozone NAAQS, and by October 5, 2008, for the 1997 $PM_{2.5}$ NAAQS.[6] It should be noted that the latter determinations pertain only to whether the submissions are complete, pursuant to Section 110(k)(1)(A), and do not constitute USEPA approval or disapproval of such submissions. In addition, the determinations required by the Consent Decree explicitly exclude any determinations regarding: (i) submissions required by Section 110(a)(2)(C) to the extent that subsection pertains to a nonattainment area new source review permit program in Part D Title I of the Clean Air Act; and (ii) submissions required by Section 110(a)(2)(I) for Part D Title I nonattainment area plans.

In accordance with the Consent Decree, on April 25, 2005, the USEPA published a finding that all fifty states failed to submit revisions to their SIPs addressing interstate transport for the 1997 8-Hour Ozone and $PM_{2.5}$ NAAQS, as required by Section 110(a)(2)(D)(i) of the Federal Clean Air Act.[7] That finding initiated a two-year deadline for the promulgation of a Federal Implementation Plan (FIP) by the USEPA for each such state unless, prior to that time, each state made a submission to meet the requirements of Section 110(a)(2)(D)(i) and the USEPA approved such submission.

On May 12, 2005, the USEPA published the Clean Air Interstate Rule (CAIR) which included the USEPA's analysis of the degree to which emissions of sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) in certain states significantly contribute to nonattainment of, or interfere with maintenance of, the 1997 8-Hour Ozone and $PM_{2.5}$ NAAQS in downwind states, and the reductions that must be achieved in those states to eliminate such contributions.

On August 15, 2006, the USEPA issued guidance for states to meet the requirements of Section 110(a)(2)(D)(i) for the 8-hour ozone and $PM_{2.5}$ NAAQS.[8] This guidance indicated that states within the CAIR region, which includes New Jersey (the State), could satisfy the requirements under Section 110(a)(2)(D) by satisfying the requirements of the CAIR, and addressed what other states that are outside of the CAIR region should consider doing to meet the "significant contribution" and "interfere with maintenance" requirements of Section 110(a)(2)(D)(i) for the 1997 standards. This guidance also addressed what all fifty states should consider in making SIP submissions to meet the "prevention of significant deterioration" and "protect visibility" requirements of Section 110(a)(2)(D)(i).

[6] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 1997 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards," October 2, 2007.

[7] 70 Fed. Reg. 21147 (April 25, 2005).

[8] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Sections 110(a)(2)(D)(i) for the 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards. United States Environmental Protection Agency," August 15, 2006.

New Jersey fulfilled the interstate transport requirements of Section 110(a)(2)(D)(i) for the 1997 NAAQS, as allowed per the USEPA 2006 guidance,[9] through: 1) a letter sent to the USEPA Regional Administrator on December 22, 2006 stating the intention to submit an abbreviated CAIR SIP, but that the CAIR SIP was not enough to address New Jersey's interstate transport concerns (Appendix B); and 2) the submission of a CAIR SIP to the USEPA on June 26, 2007 that was subsequently approved by the USEPA on September 28, 2007.

On September 21, 2006, the USEPA promulgated a revised Particulate Matter (PM) NAAQS, which became effective December 18, 2006.[10] This revised standard did not result in any changes to the annual standard (15.0 $\mu g/m^3$) established in 1997, but resulted in a 24-hour standard change from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. In New Jersey, the 35 $\mu g/m^3$ 24-hour (2006) standard is more controlling or stringent than the annual standard, based on an evaluation of monitoring data. The revision of the 24-hour (2006) standards requires the states to submit revised Infrastructure/Transport SIPs by September 21, 2009.

On October 2, 2007, the USEPA issued guidance for states to complete their requirements under Sections 110(a)(1) and (2) for the 1997 8-hour ozone and $PM_{2.5}$ NAAQS.[11]

On February 25, 2008, New Jersey submitted an Infrastructure SIP to the USEPA, which addressed the remaining requirements under Section 110(a)(1) and (2) for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS.[12]

On October 22, 2008, the USEPA published a "Finding of failure to submit specific elements of Section 110(a)(2), pertaining to the fine particulate matter (PM2.5) NAAQS" concluding that the State's Infrastructure SIP fails to address the following two elements:

- A plan "addressing section 110(a)(2)(C) and (J) pertaining to the Part C Prevention of Significant Deterioration (PSD) permit program," and

- "The contingency plan portion section 110(a)(2)(G) element concerning emergency powers and adequate contingency plans."[13]

On September 25, 2009, the USEPA released guidance for the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ standards (see Appendix C).[14] In the 2009 guidance, the USEPA acknowledges that a state's

[9] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Sections 110(a)(2)(D)(i) for the 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards. United States Environmental Protection Agency," August 15, 2006.
[10] 71 Fed. Reg. 61144-233 (October 17, 2006).
[11] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 1997 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards," October 2, 2007.
[12] NJDEP. State Implementation Plan Revision for Meeting the Infrastructure Requirements of the Clean Air Act. New Jersey Department of Environmental Protection, February 2008. Other than the findings from the USEPA on October 22, 2008 (73 Fed. Reg. 62904), there has been no further action taken on this SIP revision.
[13] 73 Fed. Reg. 62904 (October 22, 2008).
[14] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to

existing infrastructure SIP may be adequate to satisfy the all of the requirements under Section 110(a)(2). Accordingly, this infrastructure certification document ("Certification") will address the elements summarized in Table 1.1, while specifically discussing the transport requirements under Section 110(a)(2)(D) for the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ NAAQS and the October 22, 2008 USEPA findings for the 1997 $PM_{2.5}$ NAAQS.

II. 42 U.S.C. § 7410(a)(1) (Section 110(a)(1))

42 U.S.C. § 7410(a)(1) addresses the timing requirement of the submissions of SIP revisions. By submitting this Infrastructure Certification to the USEPA, New Jersey will have satisfied the timing requirement to submit a plan within 3 years after the promulgation of the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ NAAQS (September 21, 2006).

III. Infrastructure Elements of the Clean Air Act Under 42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

The infrastructure elements that are required under 42 U.S.C. § 7410(a)(2) (Section 110(a)(2)) are listed in Table A1. There has been no change in authority with respect to the infrastructure requirements, since the previous infrastructure SIP revision submitted in 2008. In its 2009 guidance, the USEPA acknowledges that a state's existing infrastructure SIP may be adequate to satisfy the all of the requirements under Section 110(a)(2). New Jersey certifies compliance with these elements through its existing SIP, and as described in this Certification. This appendix discusses the elements listed in Table A1 expect for:

- Enforcement and Stationary Source Permitting – Section 110(a)(2)(C);
- Interstate Transport – Section 110(a)(2)(D);
- Emergency Powers and Contingency Plans – Section 110(a)(2)(G); and
- Consultation, Public Notification, and Prevention of Significant Deterioration – Section 110(a)(2)(J).

Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

Table A1: Infrastructure Elements Required under the Federal Clean Air Act (42 U.S.C. § 7410(a)(2) (Section 110(a)(2))

Section 110(a)(2) Element	Summary of Element	New Jersey Authority
110(a)(2)(A)	Enforceable Emission Limitations and Other Control Measures	N.J.S.A. 26:2C-8, 9, and 19 N.J.A.C. 7:27
110(a)(2)(B)	Air Quality Monitoring, Compilation, Data Analysis, and Reporting	N.J.S.A. 26:2C-9.a.
110(a)(2)(C)	Enforcement and Stationary Source Permitting	N.J.S.A. 26:2C-19 N.J.A.C. 7:27 and 7:27A
110(a)(2)(D)	Interstate Transport of Air Pollution and International Pollution Abatement	N.J.A.C. 7:27 N.J.A.C. 7:27-22.11(k) N.J.A.C. 7:27-22.24 N.J.S.A. 26:2C-8.11 N.J.S.A. 26:2C-9
110(a)(2)(E)	Resources, Conflict of Interest, and Emergency Backstop	N.J.S.A. 26:2C-8 N.J.S.A. 13:1D-9 N.J.S.A. 52:13D-12 et seq. N.J.S.A. 26:2C-22
110(a)(2)(F)	Stationary Source Emissions Monitoring and Reporting	N.J.S.A. 26:2C-9.2 N.J.A.C. 7:27
110(a)(2)(G)	Emergency Powers and Contingency Plans	N.J.S.A. 26:2C-26 et seq. N.J.A.C. 7:27-12
110(a)(2)(H)	State Implementation Plan Revision For Revised Air Quality Standards or New Attainment Methods	N.J.S.A. 13:1D-9
110(a)(2)(I)	State Implementation Plan for Nonattainment Areas	N.J.S.A. 13:1D-9
110(a)(2)(J)	Consultation and Public Notification	N.J.S.A. 26:2C-8, 9, and 19 N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.
110(a)(2)(K)	Air Quality Modeling and Reporting	N.J.A.C. 7:27-8.5 and 22.8
110(a)(2)(L)	Major Stationary Source Permitting Fees	N.J.A.C. 7:27-22.31
110(a)(2)(M)	Consultation with Local Entities	N.J.S.A. 26:2C-8 N.J.S.A. 52:14B-1 et seq.

The following discussions address the infrastructure elements required under Section 110(a)(2) for the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ health-based NAAQS,[15] with the exception of the sections listed previously.

[15] The USEPA's 2007 Guidance stated that Infrastructure State Implementation Plan requirements for the 2006 National Ambient Air Quality Standards would be addressed separately but that the requirements would be similar to those for the 1997 standards. At the time of this State Implementation Plan revision, there is no separate guidance available addressing the 2006 standards.

A. Emission Limits and Other Control Measures – 42 U.S.C. § 7410(a)(2)(A) (Section 110(a)(2)(A))

States are required to establish enforceable emission limits and other control measures, means, or techniques, as well as schedules for compliance and other related matters.

The timing requirement for this section is dependent on 42 U.S.C. § 7502 (Section 172) of the Clean Air Act. Such authority for establishing emission limits under Section 110(a)(2)(A) can be found in the State's Air Pollution Control Act at N.J.S.A. 26:2C-8, 9, and 19. New Jersey's air rules at N.J.A.C. 7:27 establish emission limits, control measures and other means by which to control air pollution and how to implement the measures. New Jersey certifies compliance with this element.

B. Air Quality Monitoring, Compilation, Data Analysis, and Reporting – 42 U.S.C. § 7410(a)(2)(B) (Section 110(a)(2)(B))

States are required to establish and operate devices, methods, systems, and procedures to monitor, compile, and analyze ambient air quality data and to provide the data to the USEPA.

New Jersey's ambient air monitoring program is required by the State's Air Pollution Control Act (N.J.S.A. 26:2C-9.a.) and the Federal Clean Air Act. New Jersey has an extensive air quality monitoring network that collects air quality data that are compiled, analyzed, and reported to the USEPA. The State's website contains up-to-date information about air quality monitoring, including a description of the network and information about monitoring of $PM_{2.5}$. See http://www.nj.gov/dep/airmon/index.html with links to all elements of the program. New Jersey commits to retaining, and continuing to operate its monitoring network, subject to a joint annual review process by both the State and the USEPA. New Jersey certifies compliance with this element.

C. Resources, Conflict of Interest, and Emergency Backstop – 42 U.S.C. § 7410(a)(2)(E) (Section 110 (a)(2)(E))

States are required to provide assurances that: (i) adequate personnel, funding, and legal authority will be available to carry out the SIP; (ii) a majority of its state board members represent the public interest and do not derive a significant portion of their income from entities that are subject to permits, and that conflicts of interest of members be adequately disclosed; and (iii) the State has responsibility for ensuring adequate implementation of plan provisions to be carried out by local districts.

New Jersey's Air Pollution Control Act at N.J.S.A. 26:2C-8 provides the authority to carry out the SIP. New Jersey's statute under N.J.S.A. 13:1D-9 is the authority and provides guidance on dedicating personnel and funds for the State to carry out the responsibilities under the SIP. The State relies on the federal grant allocated under Section 103 and 105 of the Clean Air Act for carrying out the SIP responsibilities, as well as an annual State appropriation.

The New Jersey Department of Environmental Protection (NJDEP) is the only entity that approves permits and enforcement orders in New Jersey. There is no board that carries out these

duties. New Jersey has a Conflicts of Interest Law at N.J.S.A. 52:13D-12 et seq. The NJDEP has a Code of Ethics policy that supplements the Conflicts of Interest Law and establishes procedures for reporting any work conducted by a state employee outside of the NJDEP. New Jersey has established the Clean Air Council as required in the Air Pollution Control Act. This Council is comprised of representatives from government, industry, and the public advocate groups. The Council makes recommendations to the Commissioner of the NJDEP on air pollution issues.

All 21 counties have a contract and/or grant with the NJDEP in which they are delegated authority to enforce various regulations under the County Environmental Health Act. The County Environmental Health Act allows the delegated counties to act as the NJDEP's representatives during investigations and can issue enforcement actions, assess and collect penalties, and settle cases. The Air Pollution Control Act (N.J.S.A. 26:2C-22) includes provisions for the relation of local ordinances or regulations to State law. New Jersey certifies compliance with this element.

D. Stationary Source Emissions Monitoring and Reporting – 42 U.S.C. § 7410(a)(2)(F) (Section 110(a)(2)(F))

States are to require the installation, maintenance, and replacement of equipment to monitor stationary sources of emissions by the owners or operators of these sources and the provision of periodic reports on these emissions.

The State's Air Pollution Control Act (N.J.S.A. 26:2C-9.2) gives New Jersey the authority to require emissions monitoring and reporting for stationary sources. New Jersey has adopted rules to implement the Federal requirements for stationary source emissions monitoring and reporting at N.J.A.C. 7:27. Monitoring and reporting requirements are included throughout N.J.A.C. 7:27, specifically in subchapters 8 and 22 as they relate to permits, subchapter 21 as they relate to emission statement reporting. In addition, several other subchapters within N.J.A.C. 7:27 regulate stationary sources and contain requirements for monitoring and reporting. New Jersey certifies compliance with this element.

E. State Implementation Plan Revision For Revised Air Quality Standards or New Attainment Methods – 42 U.S.C. § 7410(a)(2)(H) (Section 110(a)(2)(H))

States are required to provide for revision of a SIP from time to time when air quality standards are revised or new attainment methods become available or when the USEPA informs states that current SIPs are inadequate to attain standards or to comply with additional requirements under the Clean Air Act.

New Jersey's statute under N.J.S.A. 13:1D-9 gives New Jersey the authority to revise the SIP in response to changes in the NAAQS, availability of improved methods for attaining the NAAQS, or in response to an USEPA finding that the SIP is substantially inadequate. For example, New Jersey submitted attainment demonstration SIPs to the USEPA on October 29, 2007 for the 1997

8-hour ozone NAAQS and for the 1997 annual $PM_{2.5}$ NAAQS.[16,17] New Jersey certifies compliance with this element.

F. State Implementation Plan for Nonattainment Areas – 42 U.S.C. § 7410(a)(2)(I) (Section 110(a)(2)(I))

States are required to submit a SIP or SIP revision for nonattainment areas that meet the requirements of Part D - Plan Requirements for Nonattainment Areas under Clean Air Act Title I - Air Pollution Prevention and Control. Part D of the Clean Air Act specifies both general requirements and specific requirements for different criteria pollutants, for SIPs addressing nonattaiment areas.

New Jersey's statute under N.J.S.A. 13:1D-9 gives New Jersey the authority to submit a SIP or SIP revision in accordance with Part D of the Clean Air Act. New Jersey has in the past submitted SIPs, SIP revisions, and designation recommendations for nonattainment areas. The SIP examples cited in Section H both address nonattainment areas in New Jersey. New Jersey certifies compliance with this element.

G. Air Quality Modeling and Reporting – 42 U.S.C. § 7410(a)(2)(K) (Section 110(a)(2)(K))

States are required to provide for the use of air quality modeling to predict the effect of emissions on ambient air quality and to submit data related to such modeling when requested by the USEPA.

New Jersey's air quality modeling work complies with USEPA's final guidance (April 2007) on the use of models in attainment demonstrations for the 8-hour ozone and $PM_{2.5}$ standards. This is a rapidly evolving field in which New Jersey endeavors to use the latest methodology and techniques, and documents information that its staff uses when conducting modeling or when evaluating the performance of air quality models used for this purpose. New Jersey consults and works with regional organizations that conduct the regional air quality modeling. The regional modeling for New Jersey was included in the October 2007 8-Hour Ozone Attainment Demonstration/SIP revision, the July 2009 Regional Haze SIP, and the March 2009 $PM_{2.5}$ Attainment Demonstration/SIP revision.

Currently, the Ozone Transport Commission (OTC) and the Mid-Atlantic Regional Air Management Association (MARAMA) are coordinating the development of new regional emission inventories for the Northeastern United States to be used in the required modeling analyses, control strategy assessments, and other air quality management needs. The regional inventories and modeling will be used to concurrently address requirements for the 2008 ozone and 2006 $PM_{2.5}$ NAAQS and to evaluate progress towards long-term regional haze goals. The

[16] NJDEP. State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standard: 8-Hour Ozone Attainment Demonstration, Final. New Jersey Department of Environmental Protection, October 29, 2007.

[17] NJDEP. State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Fine Particulate Matter ($PM_{2.5}$) National Ambient Air Quality Standard; $PM_{2.5}$ Attainment Demonstration, Final. New Jersey Department of Environmental Protection, March 2009.

emissions inventories will be used in a single integrated, one-atmosphere air quality modeling platform to support state air quality attainment demonstrations.

N.J.A.C. 7:27-8.5 and 22.8 contain air quality modeling requirements for stationary sources for the State's Air Permitting Program. New Jersey certifies compliance with this element.

H. Major Stationary Source Permitting Fees – 42 U.S.C. § 7410(a)(2)(L) (Section 110(a)(2)(L))

States are required to assess the owner or operator of each major stationary source with fees sufficient to cover the reasonable costs of reviewing and acting upon any application for such a permit, and if a permit is granted, the reasonable costs of implementing and enforcing the terms and conditions of the permit. Owners or operators are also required to comply with the fee provisions of Title V Sections 501 – 507 of the Clean Air Act. Such fees are required to be payable to the permitting authority.

Under N.J.A.C. 7:27-22.31 (Operating Permits Fees), major stationary sources are required to pay fees to the State to sufficiently cover the cost of reviewing, approving, implementing and enforcing a permit. New Jersey certifies compliance with this element.

I. Consultation with Local Entities – 42 U.S.C. § 7410(a)(2)(M) (Section 110(a)(2)(M))

States are required to provide for consultation and participation by local political subdivisions affected by the plan.

New Jersey provides the opportunity for consultation and participation to local political subdivisions during the public comment period of a proposed SIP or rulemaking. The Federal Clean Air Act requires that states include a public process in the SIP. New Jersey's Air Pollution Control Act (N.J.S.A. 26:2C-8) and Administrative Procedure Act (N.J.S.A. 52:14B-1 et seq.) requires a public process for any rulemaking. The State offers the opportunity to the public to participate in the public process for a SIP or rulemaking. This includes a public comment period and a public hearing. Notices for the commenting period and the public hearing are circulated in newspapers, public libraries, and the State's Regional Enforcement Offices. The notices are also mailed through the United States Postal Service and through State listservs (electronic mailing system) to other states, regional organizations and interested parties that have signed up for the mailing, which includes the League of Municipalities. All 566 municipalities in New Jersey are members of the League of Municipalities, a voluntary association created to help communities do a better job of self-government through pooling information resources and brain power. The State assures that all comments and testimonies are seriously considered in rulemaking and when finalizing the SIP.

New Jersey is in constant communication with other State agencies and planning boards, such as New Jersey's Department of Transportation, Department of Health and Senior Services, Department of Agriculture, the Delaware Valley Regional Planning Commission, the Northern New Jersey Transportation Planning Authority, and Southern New Jersey Transportation

Planning Authority, on issues in the SIP. New Jersey also briefs the State's Clean Air Council on air issues, including the SIP. New Jersey certifies compliance with this element.

IV. Conclusion

The State submitted a SIP revision in February 2008 providing for the authorities under 42 U.S.C. § 7410(a)(1) and (2) (Section 110(a)(1) and (2) of the Clean Air Act) to develop, implement, and enforce an air quality management program that provides for attainment and maintenance of the NAAQS. Since the only authority for air quality management enacted since the previous SIP submittal addressed global warming, this Certification appendix certifies the infrastructure elements for the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS.

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

Appendix B: New Jersey Department of Environmental Protection Transport SIP Letter dated December 22, 2006

January 2010

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PO Box 402
TRENTON, NJ 08625-0402
TEL. # (609) 292-2885
FAX # (609) 292-7695

JON S. CORZINE
Governor

LISA P. JACKSON
Commissioner

December 22, 2006

The Honorable Alan J. Steinberg
Regional Administrator
United States Environmental Protection Agency
Region 2
290 Broadway- 26th Floor
New York, New York 10007-1866

Dear Regional Administrator Steinberg:

This letter is in response to the United States Environmental Protection Agency's (USEPA) April 25, 2005 finding[1] that all 50 states failed to submit State Implementation Plans (SIPs) to satisfy the requirements of Section 110(a)(2)(D)(i) of the Clean Air Act, commonly referred to as the transport SIP requirement. Specifically, this Section of the Clean Air Act requires that states submit a SIP that contains adequate provisions prohibiting any source, or other type of emissions activity, within the State from emitting any air pollutants in amounts that will:

1) Contribute significantly to nonattainment of the National Ambient Air Quality Standard (NAAQS) for areas in another state or interfere with the maintenance of the NAAQS by any other state;
2) Interfere with measures required to meet the implementation plan for any other state related to Prevention of Significant Deterioration (PSD); and,
3) Interfere with measures required to meet the implementation plan for any other state related to Regional Haze and Visibility.

On August 11, 2006, the USEPA issued guidance[2] on what states should submit in order to comply with Section 110(a)(2)(D)(i) of the Clean Air Act. The remainder of this letter outlines how New Jersey plans to address this guidance. New Jersey believes that addressing transported emissions, both to and from the State, is critical for its multistate nonattainment areas to attain and maintain the health-based ambient air quality standards. To that end, it is vital that,

[1] 70 Fed. Reg., 21147-21151 (April 25, 2005)
[2] "Guidance for State Plan Submission to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards", August 11, 2006.

in addition to the state and regional efforts currently underway, the USEPA continue to take action where states are preempted from action. Specifically, New Jersey urges the USEPA to focus its efforts to address emissions from onroad mobile sources, small offroad engines, ships and locomotives in a timely fashion.

Significant Contribution to Nonattainment, or Interference with Maintenance, of the NAAQS in Another State:

The USEPA's guidance document addresses the first two requirements of Section 110(a)(2)(D)(i) differently, depending on whether or not the state in question falls under the purview of the federal Clean Air Interstate Rule (CAIR). For those states, like New Jersey, that are subject to the requirements of the federal CAIR, the USEPA guidance indicates that submittal of a CAIR SIP, or reliance on the CAIR FIP, would satisfy the requirements of Section 110(a)(2)(D)(i). New Jersey does not concur with this guidance.

New Jersey is currently working to propose an abbreviated CAIR SIP that will comply with the federal CAIR requirements. This proposal is expected by the end of 2006. Based on the USEPA's guidance, this action by New Jersey would satisfy the requirements of the Section 110(a)(2)(D)(i). However, despite the USEPA's assurances to the contrary, New Jersey continues to be concerned that the implementation of CAIR alone will not be sufficient to address interstate transport issues, especially in the Northeastern and Mid-Atlantic United States. In fact, according to the 2010 CAIR modeling, between 26 and 82 percent (depending on the county in question) of New Jersey's 8-hour ozone is attributed to transported emissions. In addition to our concerns that CAIR is not stringent enough, nor implemented on a quick enough timeframe, to adequately meet attainment needs and provide timely protection of public health and welfare, its focus is solely on Electric Generating Units (EGUs). As such, CAIR does not address interstate transport of emissions from the other sectors (e.g., non-EGU, mobile, area).

In light of these concerns, New Jersey intends to implement additional strategies to address the transport of ozone precursors emissions both to and from the State. As part of a regional effort, New Jersey intends to:

- Continue to meet its obligations under the NO_x SIP call, while working to implement the federal CAIR program, and develop a program of additional emission reductions for EGUs,
- Update its Reasonably Available Control Technology (RACT) rules to address both the 8-hour ozone and $PM_{2.5}$ precursors,
- Review the USEPA's revised and new CTGs, as they are released, and update state regulations where New Jersey has affected sources,
- Continue to implement the Low Emission Vehicle (LEV) requirements,
- Develop rules and/or other measures to address emissions on High Electrical Demand Days (HEDD)
- Propose additional requirements for consumer product formulations and portable fuel containers, and
- Reduce the allowable sulfur content in heating oil.

Many of New Jersey's existing requirements are already more stringent than the existing pollution control requirements in neighboring [re: upwind] states. We encourage our neighboring states to at least match our existing requirements, and we commit to consider any additional measures, beyond those already in place, implemented by our neighboring states, if more stringent than our current actions. We also continue to work with our neighboring states, both within and near the Ozone Transport Region, to develop more stringent regional measures to improve air quality throughout the OTR and beyond.

All actions which New Jersey determines are necessary to attain and maintain the NAAQS in New Jersey, and to attain and maintain the NAAQS in neighboring states, will be proposed and included as part of New Jersey's SIPs, and taken through public process at that time.

The PSD and Nonattainment New Source Review (NNSR) Requirement:

The USEPA's guidance requires states to confirm that:

1) Major sources currently subject to PSD and NNSR permitting programs also apply to the 8-hour ozone standard and that SIP-approved states are on track to meet the June 15, 2007 deadline for SIP submissions required by the Phase II ozone implementation rule.

2) Major sources are subject to PSD and NNSR permitting programs implemented in accordance with the USEPA's interim guidance calling for use of PM_{10} as a surrogate for $PM_{2.5}$ in the PSD and NNSR programs.

The entire State of New Jersey was previously in nonattainment for the 1-hour ozone NAAQS, and as such New Jersey already has a NNSR permitting program addressing the ozone precursors (VOC and NO_x). Since the entire State continues to be in nonattainment for the 8-hour ozone NAAQS, the existing ozone NNSR program remains in effect and applies to the 8-hour ozone NAAQS standard for major stationary sources. The State is on track to meet its June 15, 2007 obligations to submit a final attainment demonstration for the 8-hour ozone NAAQS by that date. Changes to New Jersey's NNSR rules are not necessary for ozone.

On December 29, 2005, the New Jersey Department of Environmental Protection (NJDEP) submitted an equivalency determination documenting that the current New Jersey NNSR program is more stringent than the Federal program, including lower applicability levels and higher offset rates than the federal rules. These more stringent requirements are part of New Jersey's effort to reduce transported air pollution.

With respect to the $PM_{2.5}$ standard, New Jersey has both attainment and nonattainment areas throughout the State, necessitating both a PSD and NNSR program with respect to this pollutant. To date, the USEPA has yet to finalize its implementation rule for the $PM_{2.5}$ NAAQS.

In the interim, New Jersey is complying with the USEPA's interim guidance[3] by using PM_{10} as a surrogate for $PM_{2.5}$ in its existing NNSR program. Where PM_{10} emission increases would be significant in a $PM_{2.5}$ nonattainment area, New Jersey applies its NNSR rule. The NJDEP plans to revise its NNSR program and adopt a PSD program, including specific reference to $PM_{2.5}$, once the USEPA finalizes its implementation rule for the $PM_{2.5}$ NAAQS, court remanded monitoring and recordkeeping requirements are adopted by the USEPA, and other judicial action is complete on several key areas of challenge. These rules will be subject to public comment, once proposed.

The Visibility Requirement:

The USEPA's guidance relieves the State of its Section 110(a)(2)(D)(i) requirement regarding visibility until such time as that state submits it Regional Haze SIP, due to the USEPA in December of 2007. We agree that our Regional Haze SIP will assess whether there is any interference with measures required to be included in the applicable implementation plan for any other State to prevent significant deterioration of air quality or to protect visibility. As with all of New Jersey's SIP proposals, a public comment period on the Regional Haze SIP, including the Section 110(a)(2)(D) requirement portion, will allow interested parties to provide input on the actions presented in the proposal.

If you have any questions regarding New Jersey's intended actions for addressing its Section 110(a)(2)(D)(i) obligations, please contact William O'Sullivan, Director of the Division of Air Quality, at (609) 984-1484.

Sincerely yours,

Lisa P. Jackson
Commissioner

C: Ray Werner, USEPA Region II
Rick Ruvo, USEPA Region II
Howard Geduldig, NJDOL

[3] Memorandum entitled "Implementation of New Source Review Requirements in PM-2.5 Nonattainment Areas" from Stephen D. Page, Director to the Addressees, undated. See http://www.epa.gov/NSR/guidance.html for details.

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

Appendix C: USEPA Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS) dated September 25, 2009

January 2010

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

SEP 25 2009

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)

FROM: William T. Harnett, Director
Air Quality Policy Division (C539-01)

TO: Regional Air Division Directors, Regions I-X

The purpose of this memorandum is to provide guidance on addressing the "infrastructure" elements for State Implementation Plans (SIPs) required under sections 110(a)(1) and 110(a)(2) of the Clean Air Act (CAA) for the 2006 24-hour $PM_{2.5}$ NAAQS (71 FR 61144). On December 18, 2006, EPA revised the 24-hour average $PM_{2.5}$ primary and secondary NAAQS from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$. Under sections 110(a)(1) and 110(a)(2) of the CAA, after promulgation of a new or revised NAAQS, each state is required to submit a plan to provide for the implementation, maintenance, and enforcement of that NAAQS.

States are required to address basic SIP requirements (see Attachment A), to assure attainment and maintenance of the standards. By law, SIPs to address sections 110(a) (1) and 110(a)(2) are to be submitted by states within 3 years after promulgation of a new or revised standard.[1] In many cases the section 110(a)(2) SIPs for the 1997 $PM_{2.5}$ NAAQS may already be adequate to implement the 2006 24-hour $PM_{2.5}$ NAAQS. Many of the required section 110(a)(1) and 110(a)(2) SIP elements relate to the general information and authorities that constitute the "infrastructure" of a state's air quality management program, and these have been in place since the initial SIPs were submitted in response to the 1970 Clean Air Act. However, it is still the responsibility of each state to make this determination for each new or revised NAAQS.

Determining Completeness of State Submittals

As required by section 110(a)(1), states will have to review and revise, as appropriate, their existing particulate matter SIPs to ensure that they are adequate to address the 2006 24-hour $PM_{2.5}$ NAAQS. States should, in consultation with EPA Regional Offices, refer to applicable EPA regulations governing SIP submittals in 40 CFR Part 51 – e.g., Subpart H ("Prevention of

[1] Although the rule for the revised $PM_{2.5}$ standard has an effective date of December 18, 2006, the rule was signed by the Administrator and publically disseminated on September 21, 2006. Therefore, the deadline for submittal of 110(a) SIPs for the 2006 24-hour $PM_{2.5}$ NAAQS is September 21, 2009 based on the signature date.

Air Pollution Emergency Episodes"), Subpart I ("Review of New Sources and Modifications"), Subpart J (Ambient Air Quality Surveillance), Subpart K (Source Surveillance), Subpart L (Legal Authority), Subpart M ("Intergovernmental Consultation"), Subpart O (Miscellaneous Plan Content Requirements), Subpart P ("Protection of Visibility"), and Subpart Q ("Reports"). If a state determines that its existing SIP is adequate, then the state needs to certify through a SIP submittal (e.g., a letter to the Agency from the Governor or his/her designee) that demonstrates the existing SIP contains provisions addressing all requirements of the section 110(a)(2) infrastructure elements as applicable for the 2006 24-hour $PM_{2.5}$ NAAQS. For purposes of the 2006 24-hour PM2.5 NAAQS, in cases where a state believes that it meets the requirements of sections 110(a)(1) and 110(a)(2) without further revision of its SIP, EPA believes it is appropriate for the state to submit a certification letter without holding an additional public hearing. Because prior submissions for infrastructure requirements will have met the statutory requirements for notice and public hearing, EPA believes that such process is not required now. The public will have an opportunity to review the certification when EPA takes action on the submittal through the notice-and-comment rulemaking process.

In order for EPA to determine that a submittal for a SIP is complete, the submittal must affirmatively address all required elements/sub-elements, and should include documentation demonstrating a correspondence between each infrastructure element and an equivalent state statutory or regulatory authority in the existing or submitted SIP. At a minimum, a complete submission is a letter from an appropriate state official (i.e., Governor or designee) certifying compliance with each element and with a specific description of how compliance with each element is achieved. Submissions lacking a detailed explanation for how the state's SIP meets each applicable requirement of section 110(a)(2) should be deemed incomplete. Submissions that address some but not all elements/sub-elements should not be deemed complete for the unaddressed elements/sub-elements, but will result in findings of failure to submit for only the unaddressed elements/sub-elements. After EPA makes a finding of failure to submit, the state would only be required to submit those elements that were found not to have been submitted in order for EPA to make a determination that the SIP is fully complete. Letters stating that the state will submit a SIP revision some time in the future are not complete.

A finding that the submittal is complete does not mean that the submittal is approvable because the completeness review only addresses whether the state has provided information sufficient to warrant formal EPA review for approvability. Once EPA determines a SIP submission to be complete , or after six months when that submission is deemed complete by operation of law, EPA has up to 1 year to take action on (i.e., to approve or disapprove) the submission. EPA must promulgate a Federal Implementation Plan (FIP) for the state if EPA takes any of the following final actions associated with the required SIP: (1) determines that a state has failed to make a SIP submission, (2) determines that a state has made an incomplete submission, or (3) disapproves a SIP submission. Any of these actions starts a two year FIP clock. In order to stop or rescind a FIP, the state must submit, and EPA must approve, a SIP submission that meets the applicable requirements.

Guidance for Satisfying the Section 110(a)(2)(D) Requirement

Compliance with CAA section 110(a)(2)(D) requires that states address 4 separate elements.

1. SIP Submissions from States pertaining to the "significant contribution" requirement of section 110(a)(2)(D)(i).

Section 110(a)(2)(D)(i)(I) specifically provides that each state's SIP must contain adequate provisions to prohibit air pollutant emissions from within the state that significantly contribute to nonattainment of the NAAQS in any other state. Therefore, the state's submission must explain whether or not emissions from the state have this impact and, if so, address the impact.

The state's conclusion must be supported by an adequate technical analysis. Information to support the state's determination with respect to significant contribution to nonattainment might include, but is not limited to, information concerning emissions in the state, meteorological conditions in the state and the potentially impacted states, monitored ambient concentrations in the state and the potentially impacted states, the distance to the nearest area that is not attaining the NAAQS in another state, and air quality modeling. The EPA believes that it would be appropriate for states to make this assessment by considering the impact of current or future emissions on nearby nonattainment areas, and evaluating the air quality impact and potential mitigation strategies.[2] Using these kinds of evaluations, it is EPA's intention to complete a rule to address interstate pollution transport in the eastern half of the continental United States.

EPA is currently working on a new rule to replace the CAIR rule that will address issues raised by the court in North Carolina v. EPA, 531 F.3d 896 (D.C. Cir. 2008). That new rule will assist states with obligations to address interstate transport that significantly contributes to nonattainment in another state. However, all states must submit complete 110 SIPs at this time that address the requirements of section 110(a)(2)(D) for the 2006 24-hour $PM_{2.5}$ NAAQS, and states cannot wait for the CAIR replacement rule without getting a finding of failure to submit at this time. In addition, even if the CAIR rule were not remanded by the court, states cannot rely on the current CAIR rule for this submission for the 2006 24-hour $PM_{2.5}$ NAAQS because the CAIR rule does not address this NAAQS.

2. SIP Submissions from States pertaining to the "interfere with maintenance" requirement of section 110(a)(2)(D)(i).

Section 110(a)(2)(D)(i)(I) specifically provides that each state's SIP must contain adequate provisions to prohibit air pollutant emissions from within the state that interfere with maintenance of the NAAQS in any other state. States' submissions must address this independent requirement of the statute. This provision requires evaluation of impacts on areas of other states that are meeting the 2006 24-hour $PM_{2.5}$ NAAQS, not merely areas formerly

[2] If assessing future emissions the state should attempt to represent a future year that is no further in the future than the year in which attainment of the NAAQS is required in the downwind state. In most cases we expect the attainment date to be no later than 5 years from the date of nonattainment designations. Since designations are expected to be issued in 2009, the maximum attainment date would be 2014.

designated nonattainment that are subject to a maintenance SIP. Therefore, the state's submission must explain whether or not emissions from the state have this impact and, if so, address the impact.

A state's submission for this requirement should provide the technical information which the state deems appropriate to support its conclusions. Suitable information might include, but is not limited to, information concerning emissions in the state, meteorological conditions in the state and the potentially impacted states, monitored ambient concentrations in the state and the potentially impacted states, and air quality modeling.

Using these kinds of evaluations, it is EPA's intention to complete a rule to address interstate pollution transport in the eastern half of the continental United States. However, all states must submit complete 110 SIPs at this time that address the requirements of section 110(a)(2)(D) for the 2006 24-hour $PM_{2.5}$ NAAQS and states cannot wait for the CAIR replacement rule without getting a finding of failure to submit at this time.

3. SIP submissions pertaining to the "prevention of significant deterioration" requirement of section 110(a)(2)(D)(i).

Section 110(a)(2)(D)(i)(II) contains a requirement for all states to submit SIPs that contain adequate provisions prohibiting ".... any source or other type of emission activity within the state from emitting any air pollutant in amounts which will interfere with measures required to be included in the applicable implementation plan for any other state ....to prevent significant deterioration of air quality ..."

EPA believes this requirement is satisfied for $PM_{2.5}$ if a state's SIP includes preconstruction review programs for major sources that satisfy the requirements of 40 CFR 51.165(b)(l) and 40 CFR 51.166 (i.e., New Source Review for major stationary sources locating in attainment areas when the source will cause or contribute to a violation of the NAAQS, and Prevention of Significant Deterioration (PSD), respectively). Unless the area has known outstanding permit program deficiencies, it is not necessary, at this time, for states to make a SIP submission containing rule changes specifically to address section 110(a)(2)(D)(i)(II) for the 2006 24-hour $PM_{2.5}$ NAAQS. If this is the case, the state can submit an appropriate certification as described previously in this guidance.

All areas are currently required to have some form of preconstruction permitting program for $PM_{2.5}$. This program may include a transitional program or a program that conforms with the minimum requirements of EPA's May 2008 final rule on implementation of the NSR program for $PM_{2.5}$. 73 Fed. Reg. 28321. In this action, EPA issued new final rules for certain components of $PM_{2.5}$ preconstruction permitting programs for attainment and nonattainment areas. States are currently required to revise their preconstruction review permit programs to incorporate these new requirements into an approved SIP by May 2011. However, this provision under the May 2008 rules has been challenged and is now under a petition for reconsideration whereby EPA has agreed to reconsider the schedule for revising state PSD programs for $PM_{2.5}$. Accordingly, EPA may revise the schedule for submitting the revised PSD SIPs for EPA approval. For the present time, however, the deadline for adopting and submitting $PM_{2.5}$ SIPs for NSR/PSD is May 2011. Thus, states are not required to adopt the May 2008 rules for the

purposes of satisfying the section 110(a) SIP requirement by September 2009 and may rely instead on implementing a transitional program for $PM_{2.5}$. For example, the state's PSD program would satisfy the requirements of 40 CFR 51.166 at this time if the applicable rule defines the pollutants subject to regulation, e.g., "regulated NSR pollutant," in such way as to automatically include any new NAAQS, e.g., 24-hour $PM_{2.5}$ NAAQS, that EPA may promulgate.

States with PSD FIPs in place generally are required under a delegation agreement with EPA to implement PSD in accordance with the federal PSD program, which provides for the automatic protection of any new NAAQS that EPA may promulgate. These states must ensure that their delegation agreement clearly authorizes them to implement the federal PSD program requirements as amended in May 2008. If a delegation agreement is deficient in this regard, the state should work with EPA to modify the agreement to enable implementation of $PM_{2.5}$ requirements.

In addition to the PSD permitting program, a state's SIP may include additional measures as necessary to prevent air pollution in excess of the PSD increment that defines significant deterioration for each area. 40 CFR 51.166(a). However, EPA has not yet established PSD increments for $PM_{2.5}$. Without these components of a PSD program, it is difficult for states to determine if additional measures are needed to prevent significant deterioration within the state. Likewise, a neighboring state cannot determine whether its SIP would interfere with such additional measures in another state's SIP. However, notwithstanding the absence of PSD increments for $PM_{2.5}$, EPA believes that at this time states may continue to rely on their existing PSD and NNSR permitting programs to prevent significant deterioration of air quality within their own boundaries and in adjacent states until such increments are established.

4. SIP Submissions from States pertaining to the "protect visibility" requirement of section 110(a)(2)(D)(i).

Section 110(a)(2)(D)(i)(II) also contains a requirement for all states to submit SIPs that contain adequate provisions prohibiting "... any source or other type of emission activity within the state from emitting any air pollutant in amounts which will interfere with measures required to be included in the applicable implementation plan for any other state ....to protect visibility."

EPA believes this requirement can be satisfied by an approved SIP addressing reasonably attributable visibility impairment (RAVI), if required, and an approved SIP addressing regional haze. EPA promulgated regulations in 1980 to address RAVI in Class I areas that is caused by the emissions of air pollutants from one source, or a small number of sources. See 45 FR 80084 (December 2, 1980) and current 40 CFR 51.300 – 51.307. A state must take specified steps to address RAVI after a Federal Land Manager at any time certifies that RAVI exists at a specific Class 1 Area. 40 CFR 51.302(c)(1).

Under the 1980 regulations, 35 states and the U.S. Virgin Islands were required to submit SIPs to address RAVI. EPA issued FIPs to address the requirements of RAVI for those states that had failed to submit SIPs. See 50 FR 28544 (July 12, 1985) and 52 FR 45132 (November 24, 1987). EPA is not aware of any certification by a Federal Land Manager of existing RAVI that remains unaddressed by a currently approved SIP or FIP. Accordingly, we believe that states for which EPA has approved into the state's current SIP some or all RAVI elements,

should be able to make a relatively simple SIP submission verifying that no source within the state emits pollutants that interfere with RAVI measures included in the applicable implementation plan (SIP or FIP) of any other state. As noted above for PSD, those states having full or partial FIPs in place will not satisfy the independent section 110(a)(2)(D)(i)(II) requirement unless they submit, and EPA approves into the SIP, all required RAVI elements.

In 1999, EPA issued regulations requiring states to address regional haze impacting visibility in Class I areas. See 64 FR 35714 (July 1, 1999) and current 40 CFR 51.308 - 51.309. Regional haze is visibility impairment that is produced by a multitude of sources and activities which emit visibility-impairing pollutants and their precursors and which are located across a broad geographic area. States are currently under an obligation to submit SIPs that contain measures to address regional haze, including a long-term strategy to address visibility impairment for each Class I area which may be affected by emissions from a state. These SIP submissions were due on December 17, 2007. In January 2009, EPA found that 37 states, the District of Columbia, and the U.S. Virgin Islands had failed to make all or part of the required SIP submissions to address regional haze. See 74 FR 2392 (January 15, 2009). These findings require EPA to issue FIPs within 2 years, by January, 2011, unless the states submit SIPs and EPA approves them before that date. States that intend to rely on the required regional haze SIPs to satisfy this element of their section 110(a) SIP but have not formally indicated this intention in a SIP submission, or have not yet submitted the regional haze SIP, may receive an additional finding of failure to submit this element of their section 110(a) SIP. EPA will be able to fully approve the submittal as satisfying section 110(a)(2)(D)(i)(II) only after we have taken final action approving the regional haze SIP.

Guidance for Satisfying the Section 110(a)(2)(G) Requirement

To address the section 110(a)(2)(G) element, states with air quality control regions identified as either Priority I, Priority IA, or Priority II by the "Prevention of Air Pollution Emergency Episodes" rules at 40 CFR 51.150, must develop emergency episode contingency plans. Currently, those regulations do not specifically address $PM_{2.5}$.

Until the Agency finalizes changes to the emergency episode regulations to establish for $PM_{2.5}$ specific levels for classifying areas as Priority I, IA, and II for $PM_{2.5}$, and to establish a significant harm level (SHL), EPA recommends that states through their public processes set Priority levels and emergency action levels for $PM_{2.5}$ necessary to develop emergency episode plans consistent with the requirements in 40 CFR 51.150 through 51.153. We further recommend that states consider the levels discussed in the February 12, 2007 EPA issue paper titled "Revising the Air Quality Index and Setting a Significant Harm Level for $PM_{2.5}$" and to Attachment B to this guidance in establishing Priority levels and emergency action levels, including a SHL.[3] Using the recommendations in Attachment B, for the purposes of satisfying the requirements of section 110(a)(2)(G), states would develop emergency episode plans for any area that has monitored and recorded 24-hour $PM_{2.5}$ levels greater than 140.4 $\mu g/m^3$ since 2006. If this level was never exceeded in any area of the state, the state can certify that it has appropriate general emergency powers to address $PM_{2.5}$-related episodes, and that no specific

[3] The issue paper can be found at http://www.epa.gov/ttn/caaa/gen/aqi_issue_paper_020707.pdf

emergency episode plans are necessary at this time, given the existing monitored levels.[4] States should develop submissions to meet this requirement through appropriate public processes.

In submittals addressing the 1997 $PM_{2.5}$ NAAQS, several states committed to make SIP submittals addressing section 110(a)(2)(G) only after EPA completed a rulemaking to establish a SHL for $PM_{2.5}$. We understand the motivation for taking this approach, and EPA is working to complete this rulemaking. Nevertheless, under section 110(k)(1)(B), EPA cannot find such submittals to be complete. It is for this reason that EPA is providing the recommendations in this memorandum as guidance for states to make submittals to address section 110(a)(2)(G). The SHL, Priority levels, and emergency action levels recommended in Attachment B are relevant for both the 1997 $PM_{2.5}$ NAAQS and the 2006 $PM_{2.5}$ NAAQS. If a state elects not to make a submittal that addresses section 110(a)(2)(G) for the 2006 24-hour $PM_{2.5}$ NAAQS in accordance with the Agency's recommendations or otherwise meeting the statutory requirements, EPA will have reason to make a finding of failure to submit for this NAAQS.

For Further Information

If you have any questions concerning this guidance, please contact David Sanders at (919) 541-3356. Please ensure that the appropriate air agency officials for states in your Region are made aware of this guidance.

Attachments

cc: Brian McLean, OAP
Kevin McLean, OGC
Margo Oge, OTAQ
Steve Page, OAQPS
Peter Tsirigotis, OAQPS
Richard Wayland, OAQPS
Lydia Wegman, OAQPS

[4] Under these conditions the contingency plan portion of section 110(a)(2)(G) for the 1997 $PM_{2.5}$ NAAQS, for which we issued a finding for failure to submit in October 2008, may also be resolved (73 FR 62902).

Attachment A: Required Section 110 "Infrastructure" SIP Elements[5]

Section 110(a)(2)(A) - Emission limits and other control measures: requires SIPs to include enforceable emission limits and other control measures, means, or techniques, and schedules for compliance.

Section 110(a)(2)(B) - Ambient air quality monitoring/data system: requires SIPs to provide for establishment and operation of ambient air quality monitors, collection and analysis of ambient air quality data, and to make these data available to EPA upon request.

Section 110(a)(2)(C) - Program for enforcement of control measures: requires SIPs to include a program providing for enforcement of all SIP measures and the regulation of construction of new and modified stationary sources as necessary to assure that the NAAQS are achieved, including a permit program as required in parts C and D.

Section 110(a)(2)(D) – Interstate transport provisions: requires SIPs to contain adequate provisions prohibiting emissions generated within the state from contributing significantly to nonattainment in, or interfering with maintenance by, any other state with respect to the NAAQS, or from interfering with measures required to be included in the SIP of any other state to prevent significant deterioration or to protect visibility.

Section 110(a)(2)(E) - Adequate resources: requires SIPs to provide necessary assurances for adequate personnel, funding, and authority under state law to carry out its SIP, to contain requirements addressing potential conflicts of interest, and to provide necessary assurances that the state retains responsibility for ensuring adequate implementation of the SIP where the state relies on a local or regional government for implementation of any SIP provision.

Section 110(a)(2)(F) - Stationary source monitoring system: requires SIPs to establish a system to monitor emissions from stationary sources, to submit periodic emissions reports, to correlate the emissions reports with the corresponding SIP emission limits and standards, and to make emissions reports available to the public.

Section 110(a)(2)(G) - Emergency episodes: requires SIPs to provide for authority to address activities causing imminent and substantial endangerment to public health and to provide for adequate contingency plans to implement such authority.

Section 110(a)(2)(H) - Future SIP revisions: requires SIPs to provide for SIP revisions in response to changes in the NAAQS, or availability of improved methods for attaining the NAAQS, and in response to an EPA finding that the SIP is substantially inadequate.

Section 110(a)(2)(J) - Consultation with government officials, public notification, PSD and visibility protection: requires states to provide a process for consultation with local governments and Federal Land Managers carrying out NAAQS implementation requirements;

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[5] The specific nonattainment area plan requirements of sections 110(a)(2)(C) and 110(a)(2)(I) are subject to the timing requirement of section 172, not the timing requirement of section 110(a)(1), and therefore not considered required elements of the "infrastructure SIP."

requires SIPs to notify the public if NAAQS are exceeded in an area and to enhance public awareness of measures that can be taken to prevent exceedances; and requires SIPs to meet applicable requirements of part C related to prevention of significant deterioration and visibility protection.

Section 110(a)(2)(K) - Air quality modeling/data: requires SIPs to provide for the performance of air quality modeling for predicting effects on air quality of emissions of any NAAQS pollutant and the submission of such data to EPA upon request.

Section 110(a)(2)(L) - Permitting fees: requires SIPs to require each major stationary source to pay permitting fees to cover the cost of reviewing, acting upon, implementing and enforcing a permit until such fee requirement is superseded by EPA approval of a fee program under title V of the Clean Air Act.

Section 110(a)(2)(M) - Consultation/participation by affected local entities: requires SIPs to provide for consultation and participation in SIP development by local political subdivisions affected by the SIP.

Attachment B: Recommended Interim Significant Harm Level, Priority Levels, and Action Levels for $PM_{2.5}$ Emergency Episode Plans (EEPs)

Current AQI - $PM_{2.5}$			AQI Under Consideration - 24-hour Average ($\mu g/m^3$)†	Recommended EEP Priority Region Classification *	Recommended EEP Action Level **
Category	Index Values	24-hour Average ($\mu g/m^3$)			
Good	0-50	0.0-15.4	0.0-15.4		
Moderate	51-100	15.5-40.4	15.5-35.4		
Unhealthy for Sensitive Groups	101-150	40.5-65.4	35.5-55.4		
Unhealthy	151-200	65.5-150.4	55.5-140.4		
Very Unhealthy	201-300	150.5-250.4	140.5-210.4	Priority Level II	Alert
Hazardous 1	301-400	250.5-350.4	210.5-280.4	Priority Level I and IA	Warning
Hazardous 2	401-500	350.5-500	280.5-350.4		Emergency
Significant Harm Level (SHL)			350.5		

† For a discussion of possible revisions to the AQI and SHL, see the EPA issue paper found at http://www.epa.gov/ttn/caaa/gen/aqi_issue_paper_020707.pdf

* Based on historical incidence of 24-hour average concentrations using the most recent 3 calendar years of data.

** See 40 CFR Part 51 Appendix L "Example Regulations for Prevention of Air Pollution Emergency Episodes" for an example of the application of emergency action levels.

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

Appendix D: State Collaborative Documentation

January 2010

March 9, 2009

FRAMEWORK FOR THE STATES IN THE CAIR REGION TO DEVELOP A MULTI-POLLUTANT STRATEGY TO ACHIEVE THE PUBLIC HEALTH GOALS OF THE OZONE AND PARTICULATE MATTER ($PM_{2.5}$) STANDARDS

The undersigned states identified below commit to expeditiously undertake air quality modeling to support recommendations regarding a multi-pollutant strategy to obtain the public health benefits associated with the National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter (PM) by: (1) achieving levels of nitrogen oxides (NOx) and sulfur dioxide (SO2) reductions from the EGU sector in the 28-state Clean Air Interstate Rule (CAIR) region that will satisfy the requirements of the Clean Air Act to attain the 1997 ozone and 1997 and 2006 PM 2.5 NAAQS; and (2) pursuing the development of a long-term multi-pollutant strategy (beyond 2010) to achieve additional reductions that address both the transport requirements under Section 110 (a)(2)(D) of the Clean Air Act and attainment and maintenance of the new ozone and PM NAAQS.

Short term strategies and recommendations

In the short term (approximately three months) the states will assemble data, perform modeling and develop strategies that are intended to achieve the 1997 ozone and the 1997 and 2006 PM 2.5 NAAQS and to assist EPA in designing an interstate air pollution transport program in response to the U.S. Court of Appeal's decision to remand the CAIR rule. Such efforts will include the following:

- Identification of the ozone season NOx reductions from EGUs that are needed for each state to demonstrate attainment with the 1997 ozone standard when combined with reductions from other sectors; and to satisfy each state's obligation under section 110(a)(2)(D); and
- Identification of the NOx and SO_2 reductions from EGUs that are needed for each state to demonstrate attainment with the 1997 and 2006 PM2.5 standards when combined with reductions from other sectors; and to satisfy each state's obligation under section 110(a)(2)(D).

The states anticipate offering recommendations regarding the use of interstate trading in the interstate air pollution transport program developed by EPA in response to the CAIR remand, subject to the following key conditions:

- Any interstate trading mechanisms that are developed must be justified through legal and air quality modeling analyses to ensure and demonstrate compliance with section 110(a)(2)(D);

- Appropriate geographic coverage and, as necessary, any geographic limitation, will be addressed; and
- An intrastate remedy that satisfies section 110(a)(2)(D) will be specified as a back-up for each state that takes part in the interstate trading.

The states will endeavor to finalize the short term strategies and recommendations by April 30, 2009.

Long term strategy

The states will contemporaneously work together to develop a long-term multi-pollutant strategy (beyond 2010) to identify air quality impacts from various source sectors to achieve emission reductions necessary for every state to meet the 2008 ozone and 2006 PM 2.5 NAAQS (to the extent not addressed in the short term strategies and recommendations), and may incorporate emissions trading, and/or performance standards, as appropriate, in keeping with the conditions specified above.

Connecticut

Delaware

District of Columbia

Illinois

Indiana

Maine

Maryland

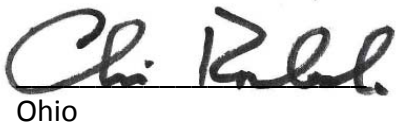
Massachusetts

Michigan

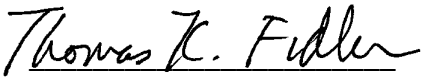
New Hampshire

New Jersey

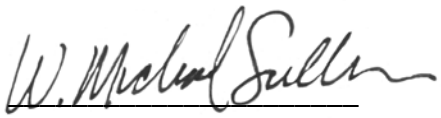
New York



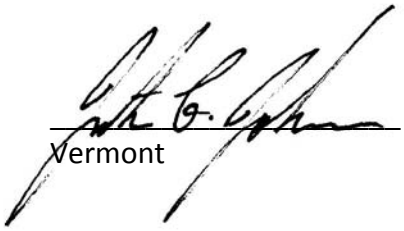
Ohio



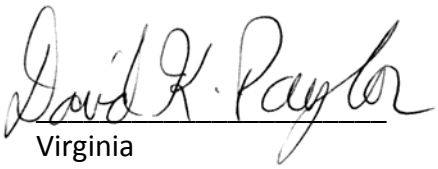
Pennsylvania



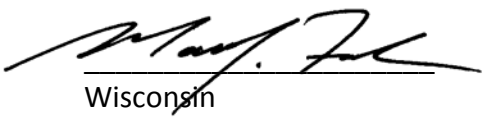
Rhode Island



Vermont



Virginia



Wisconsin

Regional Modeling in the Eastern U.S.: Preliminary Results

April 27, 2009

1

Overview of Today's Presentation

- Background
- Model Performance
- Attainment Analyses
  - Base Scenario ("C")
  - EGU Control Scenarios ("E" and "F")
- Areas of Interest
- Source Apportionment Analyses

Note: (1) Will show a subset of available results

(2) Analyses based one approach (others should be considered)

3

CAUTION!

This modeling provides, at best, ballpark estimates and is meant only to be directionally correct. It is not intended for regulatory or legal purposes.

2

Background

4

Section 110(a)(2)(D) requires SIPs to…

"… contain adequate provisions – (i) prohibiting…any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will –

(I) contribute **significantly to nonattainment** in, or **interfere with maintenance** by, any other State **with respect to any (NAAQS)**…, or

(II) **interfere with measures** required to be included in the applicable implementation plan for any other State under part C to prevent significant deterioration of air quality or **to protect visibility**…"

Note: EGU measures alone are not expected to eliminate significant contribution

5

Purposes of Modeling

- Support on-going State Collaborative policy discussions
  - Help develop state recommendations on EGUs to EPA on CAIR replacement rule
- Estimate interstate impacts, per section 110(a)(2)(D)
- Begin to assess additional control programs needed for new O_3 and $PM_{2.5}$ NAAQS

6

Specific Caveats

- Scope of modeling analysis limited
  - Geographic scope not complete – this is NOT a national analysis; focus is on OTC, SESARM, and LADCO regions
  - Attainment assessment not definitive – this is NOT intended as SIP quality attainment demonstration
  - Source apportionment analyses not comprehensive – only one of several methods considered
  - Emissions not perfect – several assumptions were made with respect to data and emissions processing
- Nevertheless, model estimates are reasonable
- Remember - purpose is to support *state* policy discussions
  - EPA will do their own modeling for a CAIR replacement rule

7

Air Quality Modeling

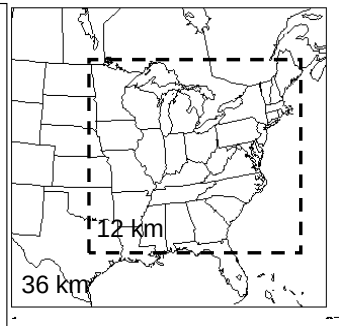
Model: CAMx

Domain/Grid: Eastern U.S.
(36 km-$PM_{2.5}$,
12 km-O_3)

Base Year: 2005

Meteorology: 2005 (and 2002)

Future Years: 2009,2012,2018
(existing control programs)



8

Existing Control Programs

- **On-Highway Mobile Sources**
  - Tier II/Low sulfur fuel
  - Inspection/Maintenance programs (nonattainment areas)
  - Reformulated gasoline (nonattainment areas)
- **Off-Highway Mobile Sources**
  - Federal control programs incorporated into NONROAD model (e.g., nonroad diesel rule), plus the evaporative Large Spark Ignition and Recreational Vehicle standards
  - Heavy-duty diesel (2007) engine standard/Low sulfur fuel
  - Federal railroad/locomotive standards
  - Federal commercial marine vessel engine standards
- **Power Plants**
  - See Scenario C slide
- **Other Point Sources**
  - VOC 2-, 4-, 7-, and 10-year MACT standards
  - Combustion turbine MACT
  - Industrial boiler/process heater/RICE MACT
  - Miscellaneous consent decrees and settlement agreements
- **Area Sources**
  - Aerosol coatings (new rule)
  - Architectural and industrial maintenance (AIM) coatings (amendments)
  - Household and institutional consumer products (amendments)
  - Portable fuel containers (Mobile Source Air Toxics rule)

9

Scenario C

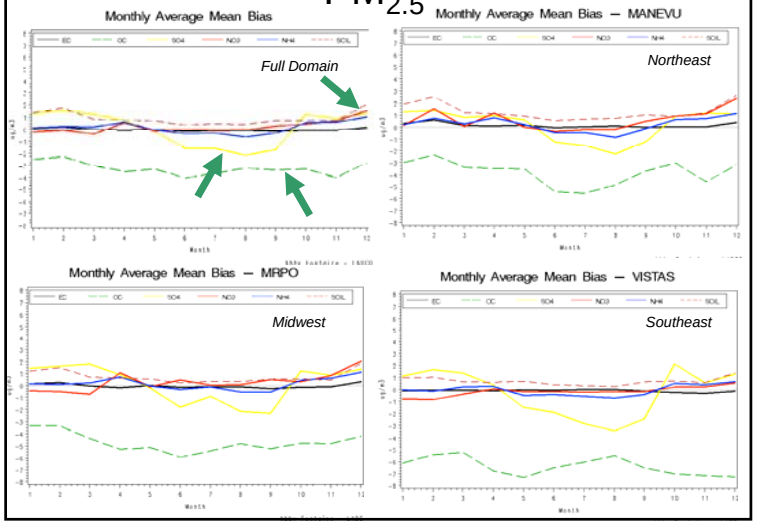
- Base: 2007 CEM emissions data
- Growth: Growth factors based on EIA data by NERC region and by fuel type (e.g., IN, KY, MI, OH = ECAR; 2007-2018=13.5%)
- Control: All legally enforceable controls identified by states plus other controls expected for compliance with CAIR (i.e., EPA's NEEDS list)

10

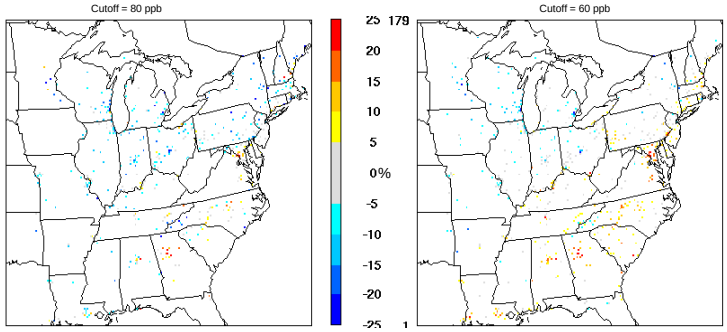
Model Performance

11

$PM_{2.5}$



Ozone



Summary: most values within ± 15%

13

Attainment Test

FY D.V. = BY D.V. x RRF

Future Year Design Value	*Base Year Design Value (Monitoring data)*	*Relative Reduction Factor (Modeling data)*

If FY D.V. > NAAQS, then **nonattainment**

If FY D.V. < NAAQS, then **attainment**

15

Model Results

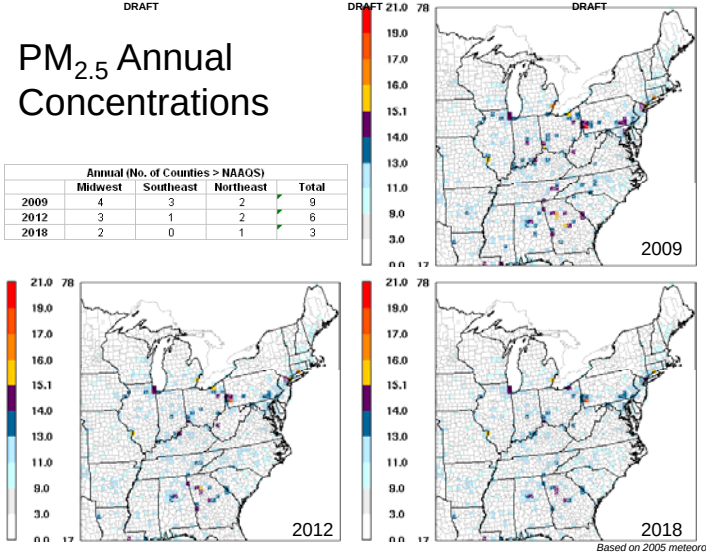
Attainment Test

14

$PM_{2.5}$ Annual Concentrations

DRAFT

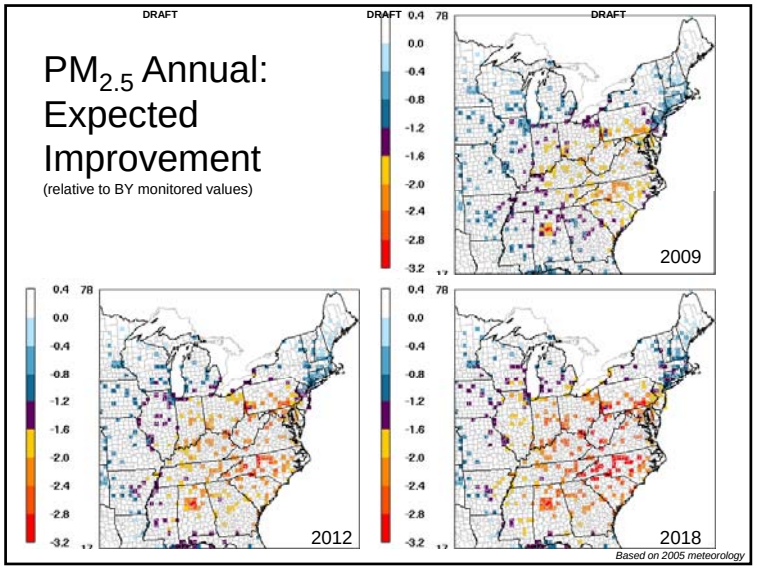
Annual (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	4	3	2	9
2012	3	1	2	6
2018	2	0	1	3



Based on 2005 meteorology

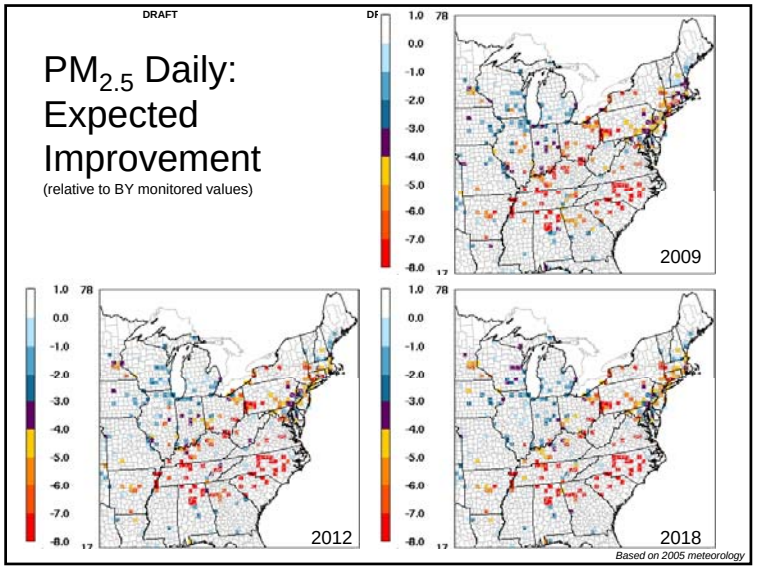
$PM_{2.5}$ Annual: Expected Improvement

(relative to BY monitored values)



$PM_{2.5}$ Daily: Expected Improvement

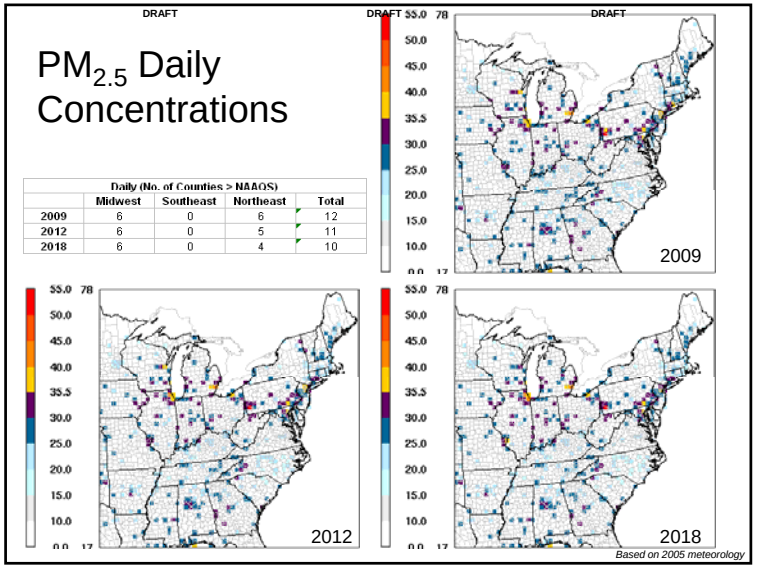
(relative to BY monitored values)



$PM_{2.5}$ Daily Concentrations

Daily (No. of Counties > NAAQS)

	Midwest	Southeast	Northeast	Total
2009	6	0	6	12
2012	6	0	5	11
2018	6	0	4	10



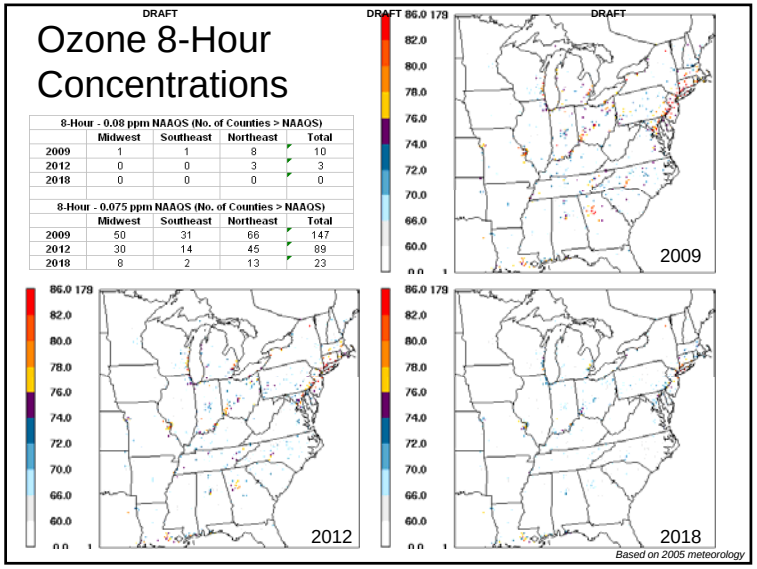
Ozone 8-Hour Concentrations

8-Hour - 0.08 ppm NAAQS (No. of Counties > NAAQS)

	Midwest	Southeast	Northeast	Total
2009	1	1	8	10
2012	0	0	3	3
2018	0	0	0	0

8-Hour - 0.075 ppm NAAQS (No. of Counties > NAAQS)

	Midwest	Southeast	Northeast	Total
2009	50	31	66	147
2012	30	14	45	89
2018	8	2	13	23



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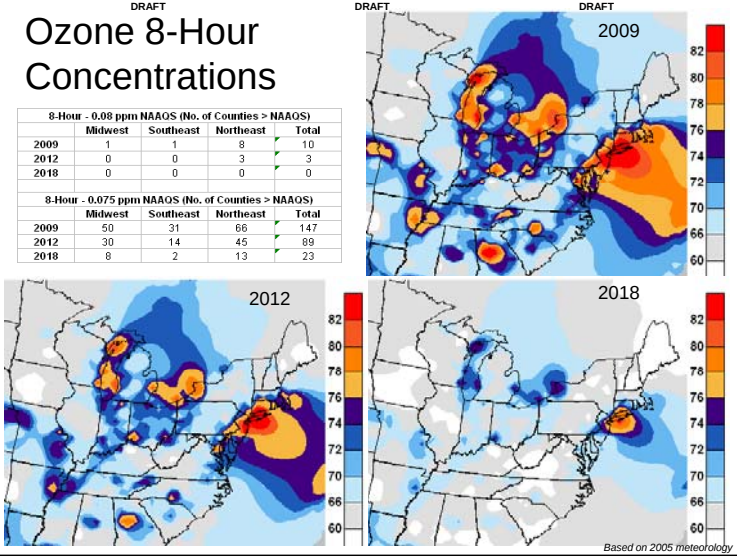
Ozone 8-Hour Concentrations

8-Hour - 0.08 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	1	1	8	10
2012	0	0	3	3
2018	0	0	0	0

8-Hour - 0.075 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	50	31	66	147
2012	30	14	45	89
2018	8	2	13	23

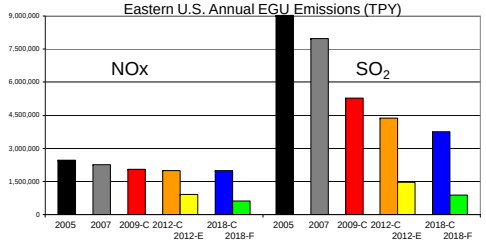


Based on 2005 meteorology

EGU Control Strategies

	Scenario E (2012)	Scenario F (2018)
NOx	0.125 lb/MMBTU	0.07
SO_2	0.25	0.10

Eastern U.S. Annual EGU Emissions (TPY)



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Reference: "Options for EGU Controls in the Eastern U.S.: White Paper", October 3, 2008, State Collaborative Technical Workgroup

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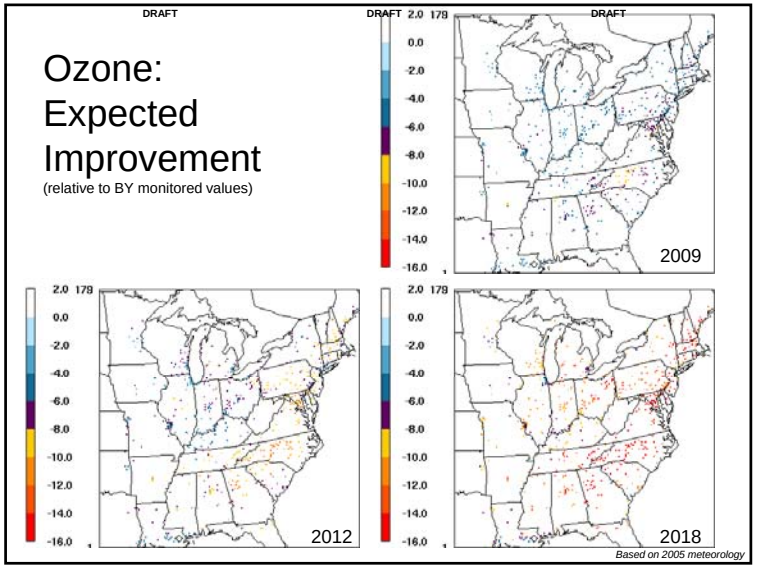
Ozone: Expected Improvement

(relative to BY monitored values)



Based on 2005 meteorology

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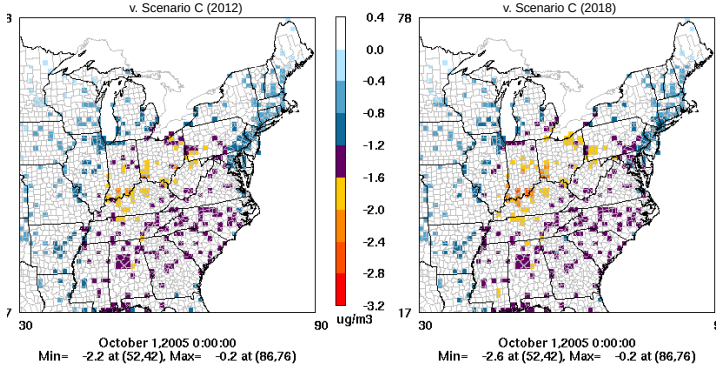
$PM_{2.5}$ Annual: Air Quality Improvement

(relative to Scenario C)

Scenario E (2012) v. Scenario C (2012)

Scenario F (2018) v. Scenario C (2018)



Average Improvement: $PM_{2.5}$ Annual = 1.0 ug/m3 (Scen. E); 1.1 ug/m3 (Scen. F)

Based on 2005 meteorology

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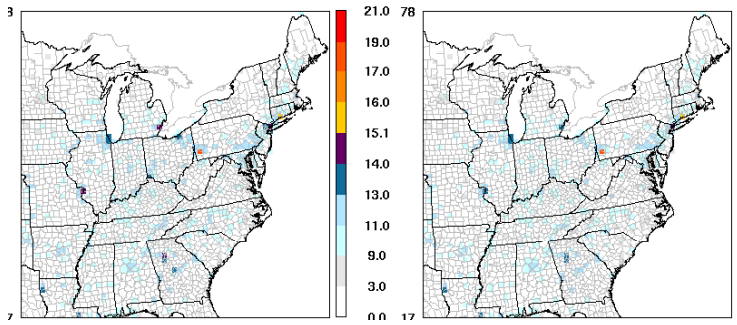
$PM_{2.5}$ Annual Concentrations

Scenario E (2012) | Scenario F (2018)



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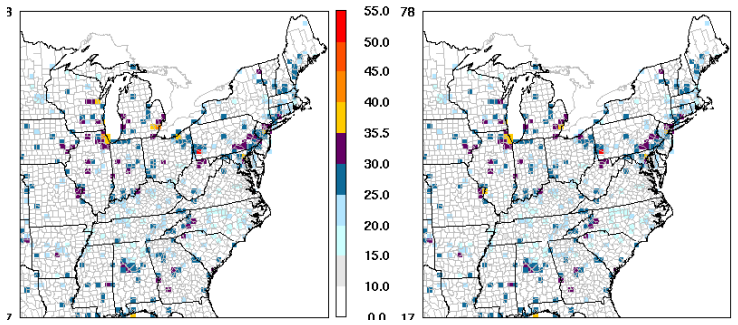
$PM_{2.5}$ Daily Concentrations

Scenario E (2012) | Scenario F (2018)



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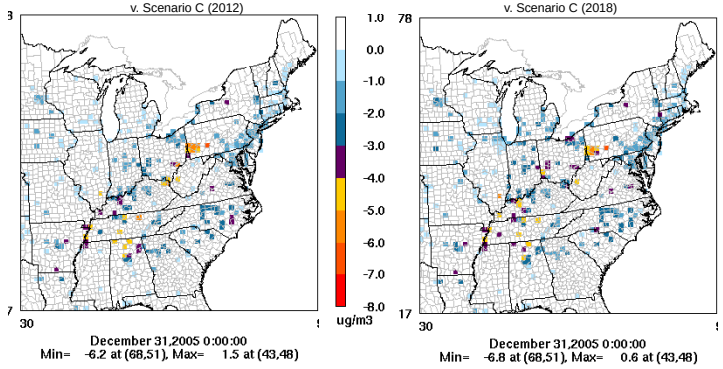
$PM_{2.5}$ Daily: Air Quality Improvement

(relative to Scenario C)

Scenario E (2012) v. Scenario C (2012) | Scenario F (2018) v. Scenario C (2018)



Average Improvement: $PM_{2.5}$ Daily = 1.1 ug/m3 (Scen. E); 1.3 ug/m3 (Scen. F)

Based on 2005 meteorology

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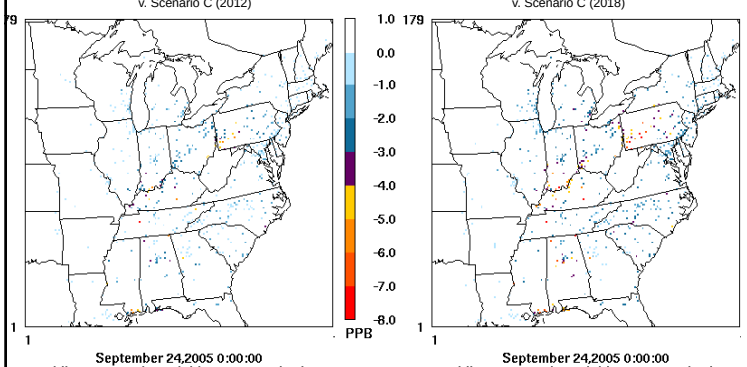
Ozone: Air Quality Improvement

(relative to Scenario C)

Scenario E (2012) v. Scenario C (2012) | Scenario F (2018) v. Scenario C (2018)



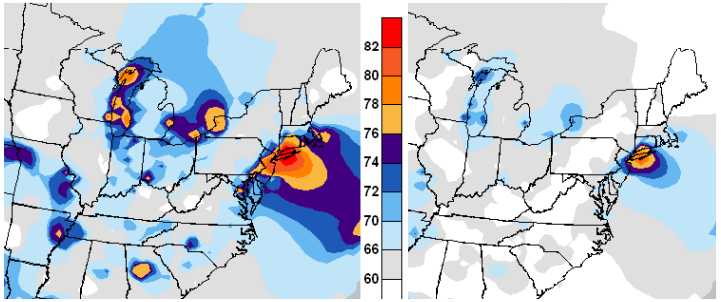
Average Improvement: Ozone = 1.6 ppb (Scen. E); 2.4 ppb (Scen. F)

28

Based on 2005 meteorology

Ozone 8-Hour Concentrations

Scenario E (2012) Scenario F (2018)



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Areas of Interest

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Proposed Areas of Interest

- Significance Contribution Test
  - Current ('06-'08) monitored design value > NAAQS, and/or
  - 2009, 2012, or 2018 modeled value > NAAQS
- Interference with Maintenance Test
  - Current ('06-'08) monitored design value > 0.95 x NAAQS, and/or
  - 2009, 2012, or 2018 modeled value > 0.95 x NAAQS

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Thresholds

	Nonattainment	Maintenance*
$PM_{2.5}$-Annual	$\geq$ 15.1 ug/m^3	$\geq$ 14.3 ug/m^3
$PM_{2.5}$-Daily	$\geq$ 35.5 ug/m^3	$\geq$ 33.7 ug/m^3
Ozone-85ppb	$\geq$ 85 ppb	$\geq$ 81 ppb
Ozone-75 ppb	$\geq$ 76 ppb	$\geq$ 72 ppb

** Based on 95% of NAAQS*

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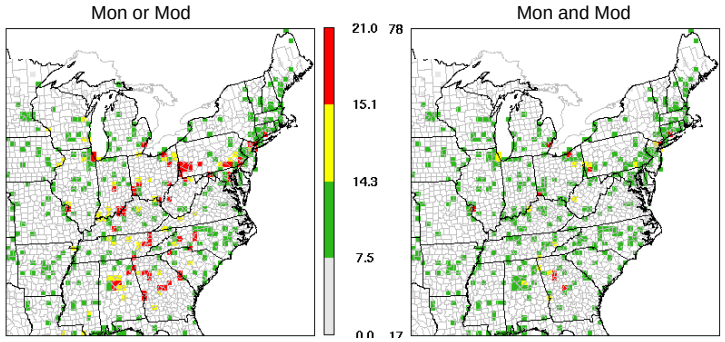
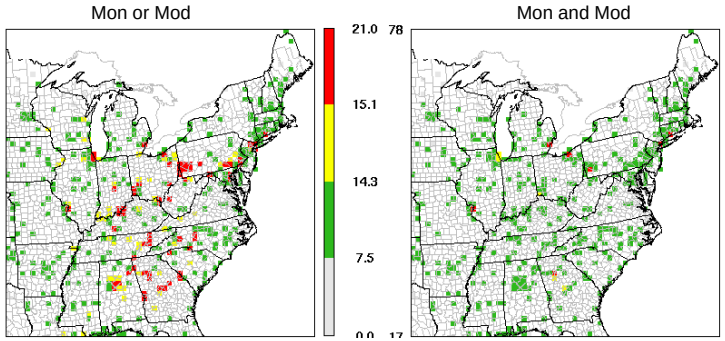
2009 $PM_{2.5}$ Annual



based on 2005-2007 monitoring data

33

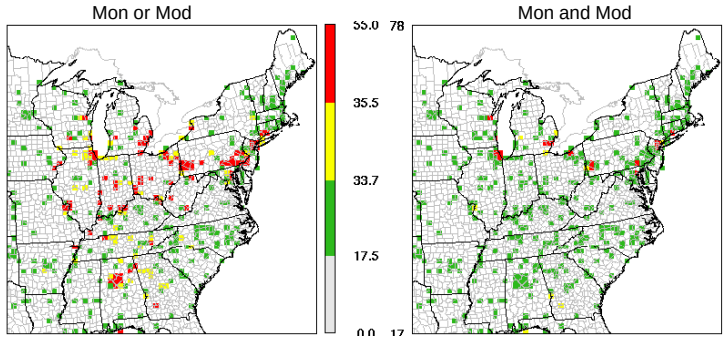
2012 $PM_{2.5}$ Annual



based on 2005-2007 monitoring data

34

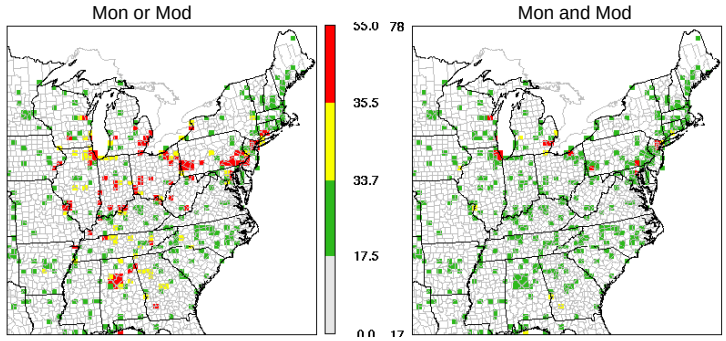
2009 $PM_{2.5}$ Daily



based on 2005-2007 monitoring data

35

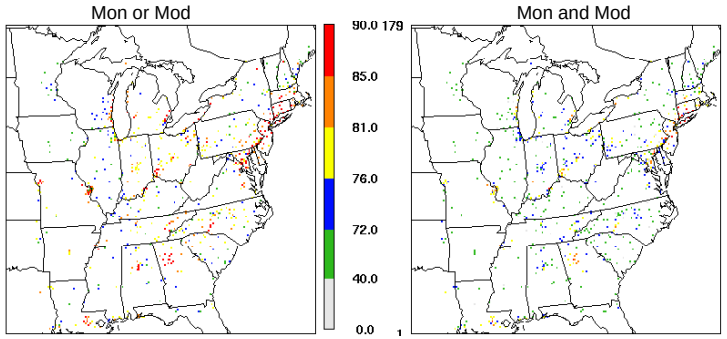
2012 $PM_{2.5}$ Daily



based on 2005-2007 monitoring data

36

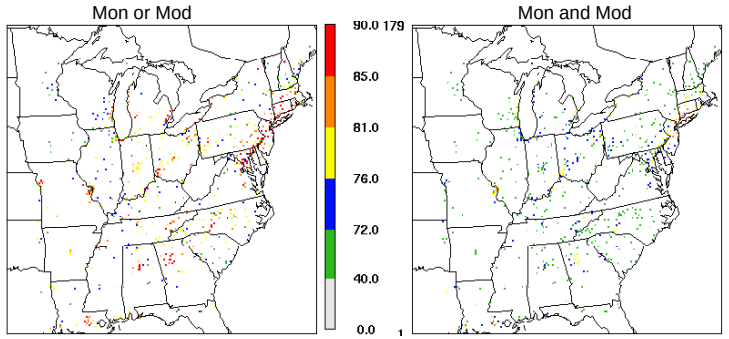
2009 Ozone



based on 2005-2007 monitoring data

37

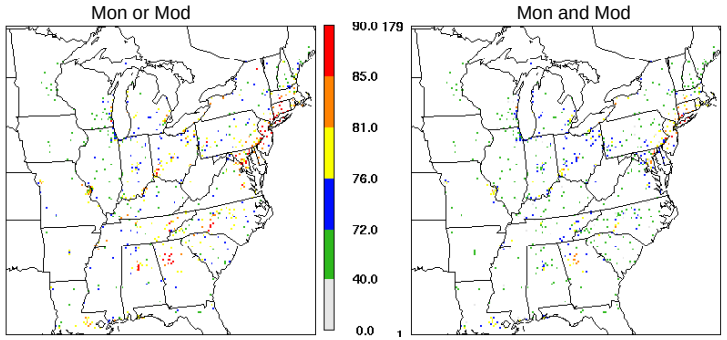
2012 Ozone



based on 2005-2007 monitoring data

39

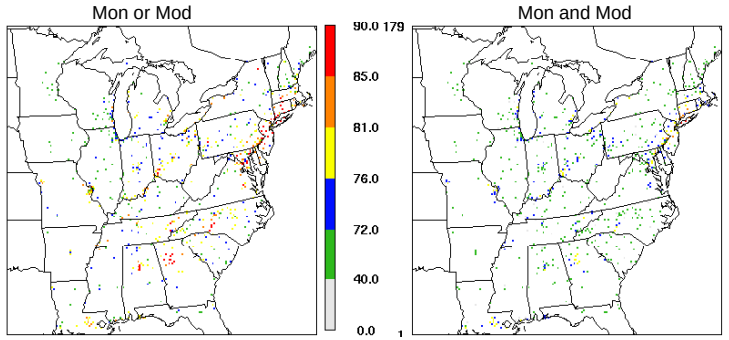
2009 Ozone



based on 2006-2008 monitoring data

38

2012 Ozone



based on 2006-2008 monitoring data

40

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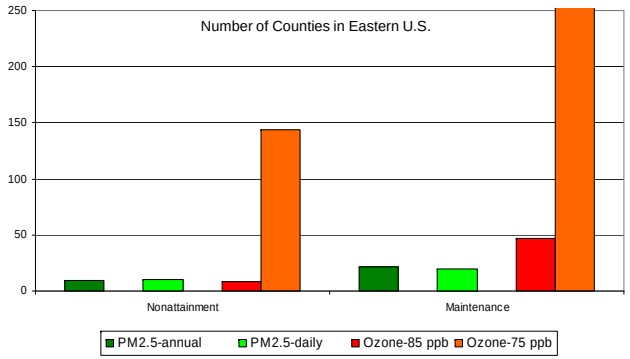
Summary: Nonattainment and Maintenance Areas of Interest



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$PM_{2.5}$ Areas of Interest

(based on criteria for significant contribution)

		Annual			Daily		
Southeast		**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
GA	Atlanta	X	X				
	Macon	X					
Midwest							
IL	Granite City	X	X	X			X
	Chicago				X	X	X
MI	Detroit	X	X	X	X	X	X
OH	Cincinnati	X					
	Cleveland	X	X		X	X	X
WI	Milwaukee				X	X	X
Northeast							
NY	New York	X	X		X	X	X
MD	Baltimore				X	X	X
PA	Lancaster				X	X	X
	Liberty-Clairton	X	X	X	X	X	X

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Another Approach for Interference with Maintenance: Example

	charlotte	washington	detroit	cleveland	cincinnati	providence	springfield
2003-2005	87	91	87	91	89	89	84
2004-2006	88	90	79	86	86	85	86
2005-2007	93	89	86	90	88	84	92
Ave	89	90	84	89	88	86	87
Max	93	91	87	91	89	89	92
2006-2008	94	87	82	84	85	82	88
Based on Ave							
2009	**81.2**	**83.4**	**81.7**	**83.8**	**82.5**	**81.6**	**82.6**
2012	78.0	80.3	80.6	81.4	80.4	78.9	79.6
Based on Max							
2009	84.5	84.3	84.6	**85.7**	83.8	84.4	**87.0**
2012	81.2	81.2	83.5	83.2	81.6	81.7	83.9

Pros: Accounts for 'historic variability' based on mon. data
Uses NAAQS as threshold

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Ozone Areas of Interest

(based on criteria for significant contribution)

		0.08 ppm NAAQS			0.075 ppm NAAQS		
Southeast		**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
GA	Atlanta	X			X	X	
NC	Charlotte				X	X	
TN	Knoxville				X		
	Memphis				X	X	
Midwest							
IL	Chicago				X		
MI	Detroit				X	X	X
	Allegan	X			X	X	X
OH	Cincinnati				X	X	X
	Cleveland				X	X	X
	Columbus				X	X	
WI	Milwaukee				X	X	X
	Manitowoc				X	X	
	Sheboygan				X	X	
	Door County				X	X	
MO	St Louis				X	X	X
Northeast							
DC	Washington				X	X	
CT	Greater CT	X			X	X	
MD	Baltimore	X	X		X	X	X
MA	Boston-Lawrence				X	X	
	Springfield				X	X	
NY	New York City	X	X		X	X	X
	Rochester				X	X	
	Poughkeepsie				X	X	
	Jamestown				X	X	
	Buffalo				X	X	
PA	Clearfield				X		
	Philadelphia	X			X	X	X
	Pittsburgh				X		
RI	Providence				X	X	
					+29	+16	+3
					no. additional counties		

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Model Results

Source Apportionment

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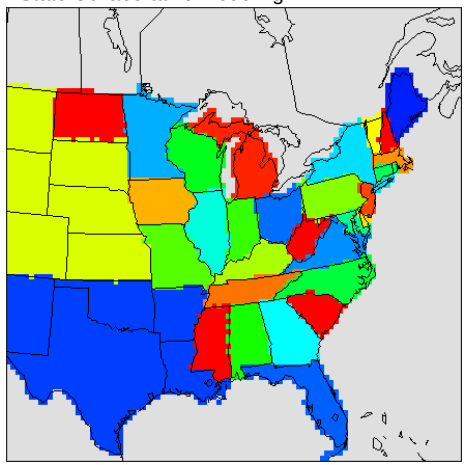
Evaluating Significant Contributions

State Collaborative Modeling

Source Regions:
(see map)

Source Groups:
EGU Point
Non-EGU Point
Area
On-road
Non-road
Biogenics/Ammonia



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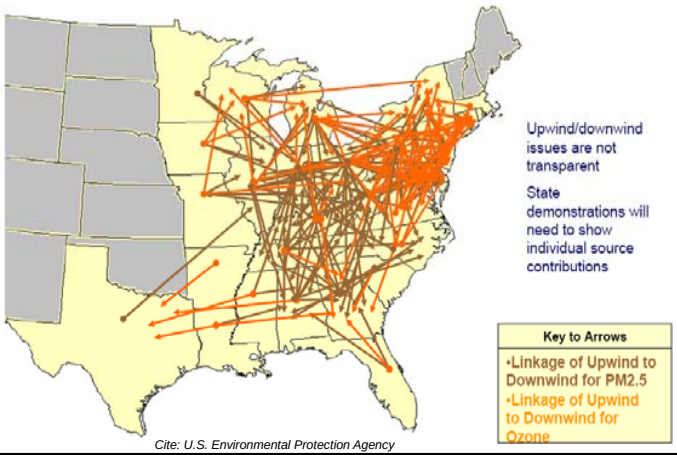
Evaluating Significant Contribution

EPA's Clean Air Interstate Rule



Cite: U.S. Environmental Protection Agency

PSAT/OSAT Results

- Contributions as a function of…
  - Source region (33): states or groups of states (see map)
  - Source sector (7): EGU point, non-EGU point, area, on-road, non-road, biogenics/ammonia, BC/IC
  - Pollutants: ozone - VOC, NOx
    $PM_{2.5}$ - SO_4, NO_3, NH_4,POC, EC,FPRM
- Absolute (ug/m^3 or ppb) and relative (%) contributions
- Results processed with standard model programs
  - Ozone: APCA algorithm allocates ozone productions to anthropogenic emissions (EPA used this algorithm in CAIR)
  - Alternative methods could be used to incorporate monitoring data

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Processing and Analysis of PSAT/OSAT Information from CAMx

	Annual PM	Daily PM	Ozone
Modeling Period	Jan 1 – Dec 31	Jan 1 – Dec 31	Jun 1 – Sep 30
Calculation of Absolute PSAT/OSAT Contributions*	Average over all 8,760 hourly PSAT values	Average over all hourly PSAT values from days where the simulated 24-hr average total $PM_{2.5}$ conc. > 30 ug/m^3	Average over all hourly OSAT values for hours where the hourly predicted O_3 conc. > 75 ppb
Calculation of Relative PSAT/OSAT Contributions	Normalized by model-predicted annual average total $PM_{2.5}$ mass at each location	Normalized by average of model-predicted daily total $PM_{2.5}$ from all days used to calculate the absolute PSAT contributions at each location	Normalized by average of model-predicted hourly ozone values from all hours used to calculate the absolute OSAT contributions at each location

*CAMx provides PSAT/OSAT values at each grid cell for each hour for each pollutant, source region, and source sector

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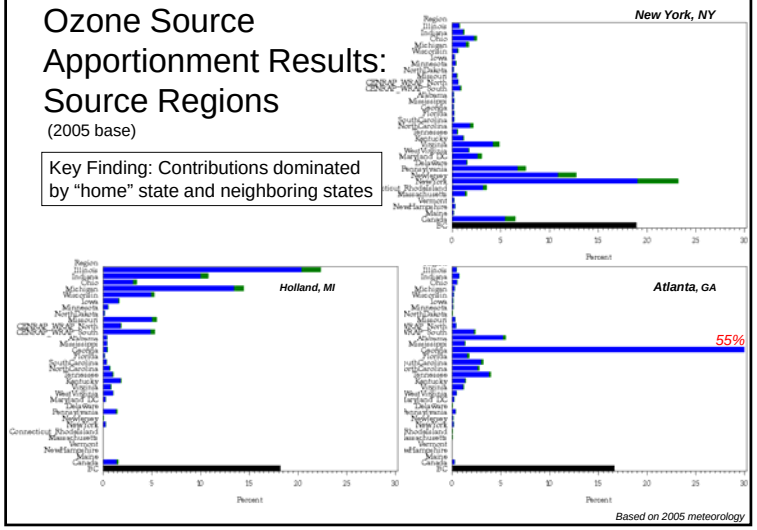
Ozone Source Apportionment Results: Source Regions

(2005 base)

Key Finding: Contributions dominated by "home" state and neighboring states



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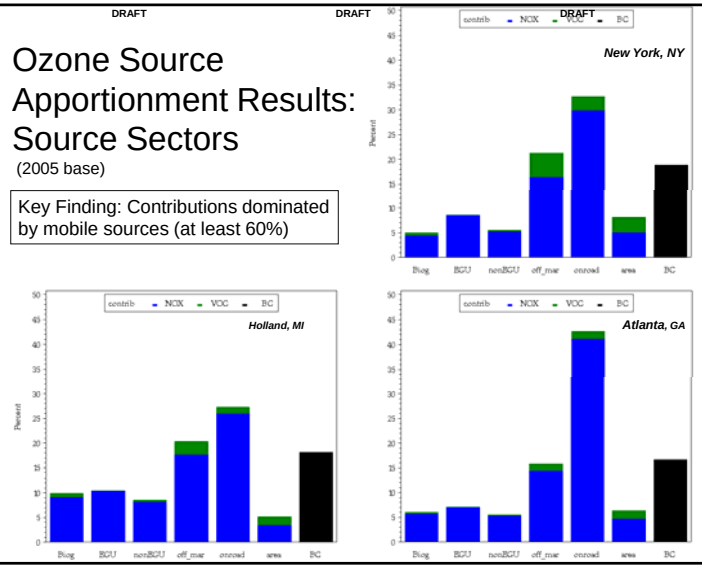
Ozone Source Apportionment Results: Source Sectors

(2005 base)

Key Finding: Contributions dominated by mobile sources (at least 60%)



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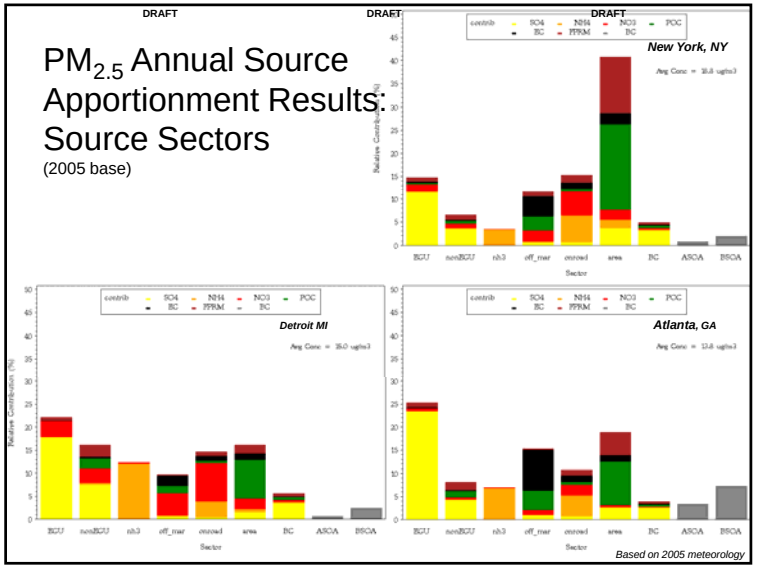
$PM_{2.5}$ Annual Source Apportionment Results: Source Sectors

(2005 base)



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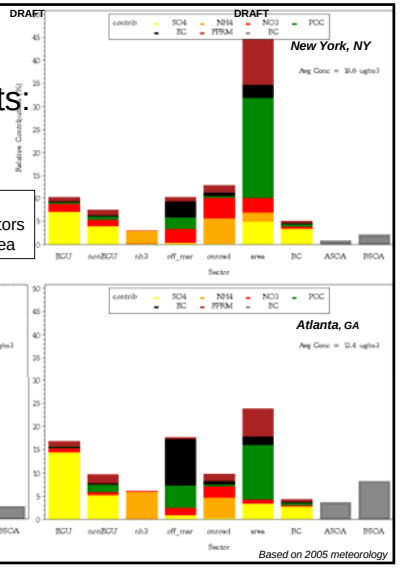
$PM_{2.5}$ Annual Source Apportionment Results: Source Sectors

(2012 Scenario C)

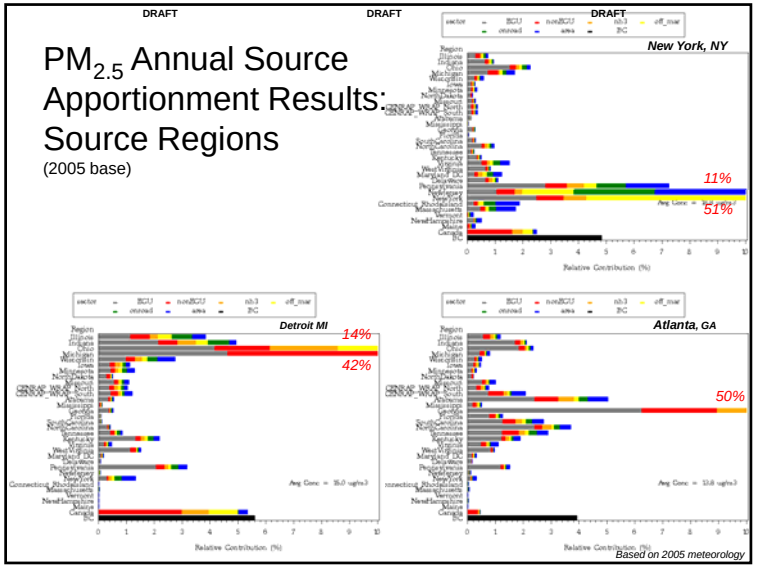
Key Findings:
- All source categories are important contributors
- Relative amount of contribution varies by area



DRAFT DRAFT DRAFT

$PM_{2.5}$ Annual Source Apportionment Results: Source Regions

(2005 base)

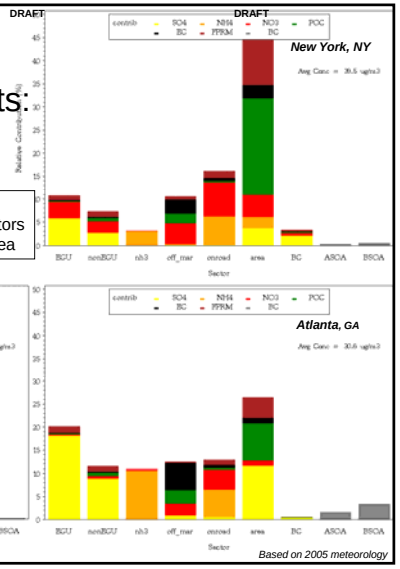


DRAFT DRAFT DRAFT

$PM_{2.5}$ Daily Source Apportionment Results: Source Sectors

(2012 Scenario C)

Key Findings:
- All source categories are important contributors
- Relative amount of contribution varies by area



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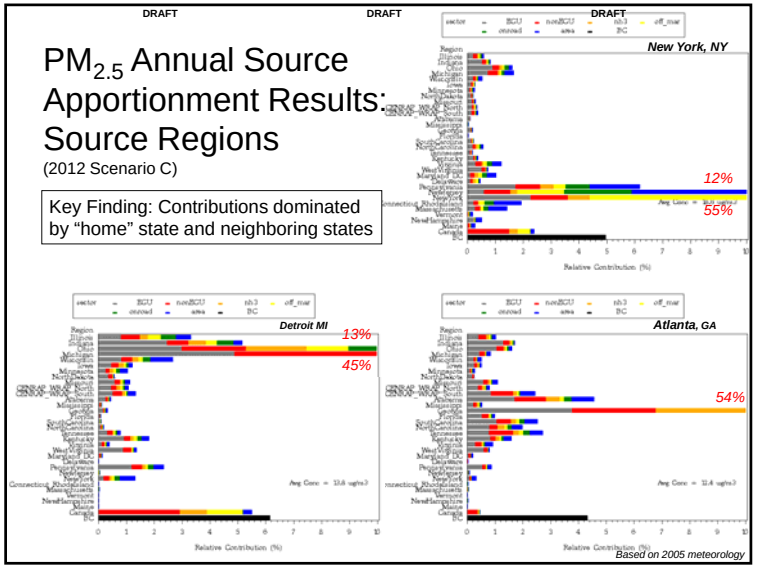
$PM_{2.5}$ Annual Source Apportionment Results: Source Regions

(2012 Scenario C)

Key Finding: Contributions dominated by “home” state and neighboring states



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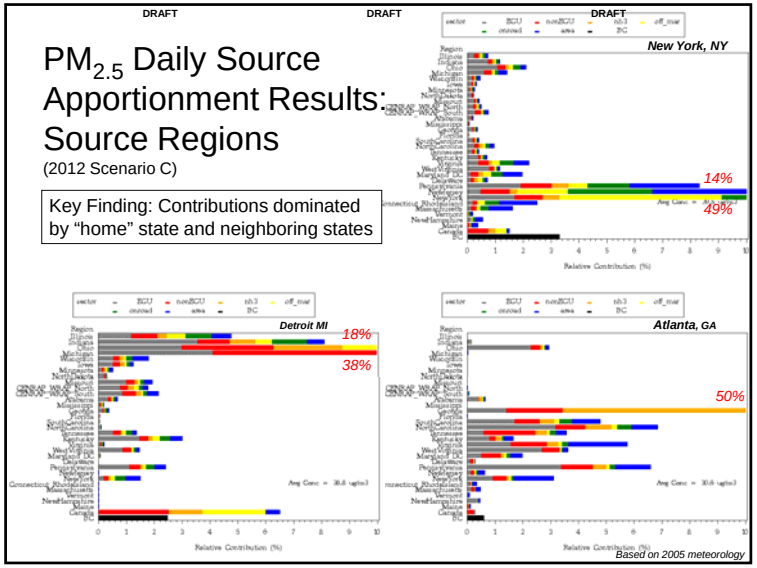
$PM_{2.5}$ Daily Source Apportionment Results: Source Regions

(2012 Scenario C)

Key Finding: Contributions dominated by "home" state and neighboring states



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$PM_{2.5}$ Annual: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	IN, OH, MO, AL, GA, SC, NC, TN, KY	AL, GA, SC, TN	AL, GA	AL, GA	GA
* Macon, GA	IL, IN, MI, OH, MO, AL, GA, FL, SC, NC, TN, KY, VA, WV, PA	AL, GA, FL, SC, NC, TN	AL, GA, SC	AL, GA	GA
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WV, PA, CAN	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, AL, TN, KY, WV, PA, CAN	IL, IN, MI, OH, TN, KY, WV, PA, CAN	IL, IN, MI, OH, KY	IN, MI, OH, KY	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WI, PA, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN	IN, MI, OH, CAN
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, MI, IA, MO	IL, IN, MO	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, NY,CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, KY, WV, PA	MI, OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT,RI, MA, CAN	PA, NY, NJ, CAN	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 "C"
2005 met

Average Contributions

	In-State	Out-State	Total					Out-of-state Contribution				
	%	%	1%	2%	3%	4%	5%	1%	2%	3%	4%	5%
PM2.5-Annual												
2005	40	60	94	86	77	71	67	89	75	58	50	42
2012	43	57	94	85	77	72	68	89	72	58	49	42
PM2.5-Daily												
2005	38	62	95	89	83	78	75	91	82	71	63	57
2012	43	57	95	90	83	78	74	91	81	70	60	52
Ozone												
2005	25	75	93	83	76	69	64	90	77	66	57	50
2012												

Based on 20-30 key monitors in NE, SE, and MW

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$PM_{2.5}$ Annual: Contributing States (ug/m^3)

	>0.15	>0.30	>0.45	>0.60	>0.75
Southeast					
* Atlanta, GA	IN, OH, MO, AL, GA, SC, NC, TN, KY, ~~IL~~, FL	AL, GA, SC, TN	AL, GA, TN	AL, GA	GA
* Macon, GA	~~IL~~, IN, MI, OH, MO, AL, GA, FL, SC, NC, TN, KY, VA, ~~WV, PA~~	AL, GA, ~~FL~~, SC, NC, ~~TN~~	AL, GA, ~~SC~~	AL, GA, ~~SC~~	GA
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WV, PA, CAN, **KY, NY**	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, ~~AL~~, TN, KY, WV, PA, CAN	IL, IN, MI, OH, ~~TN,~~ KY, ~~WV, PA, CAN~~	IL, IN, MI, OH, KY	IN, ~~MI~~, OH, KY	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WI, PA, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN	~~IN~~, MI, OH, CAN
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, MI, IA, MO	IL, IN, MO, **MI**	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, NY,CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, KY, WV, PA	MI, OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT,RI, MA, CAN	PA, NY, NJ, CAN, **OH, MI, CT,RI**	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 "C"
2005 met

Changes relative to 2012 C, 2005 met (% version): deletions (cross-outs), additions (bold red)

DRAFT DRAFT DRAFT

$PM_{2.5}$ Annual: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	IN, OH, ~~MO~~, AL, GA, SC, NC, TN, KY, **FL**	AL, GA, SC, TN, **MC**	AL, GA, TN, **SC**	AL, GA	GA
* Macon, GA	IL, IN, ~~MI~~, OH, ~~MO~~, AL, GA, FL, SC, NC, TN, KY, VA, ~~WV~~, PA	AL, GA, FL, SC, NC, TN, **MI**	AL, GA, SC	AL, GA, SC	GA, **AL**
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, ~~NY~~, CAN, **IA, MO, TN**	IL, IN, MI, OH, WV, PA, CAN, **KY**	IN, MI, OH, PA, CAN	MI, OH, ~~PA, CAN~~, **MI**	MI, OH, ~~PA, CAN~~
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, AL, TN, KY, WV, PA, CAN, **GA**	IL, IN, MI, OH, TN, KY, ~~WV, PA, CAN~~	IL, IN, MI, OH, KY	IN, MI, OH, KY, **IL**	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, ~~WV~~, PA, ~~NY~~, CAN	IL, IN, MI, OH, WI, ~~PA~~, CAN, **KY**	IL, IN, MI, OH, CAN	IN, MI, OH, CAN, **IL**	IN, MI, OH, ~~CAN~~
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, ~~MI~~, IA, MO	IL, IN, MO	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, ~~NY~~, CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, KY, WV, PA	~~MI~~, OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT/RI, ~~MA~~, CAN	PA, NY, NJ, ~~CAN~~	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 "C"
2002 met

Changes relative to 2012 C, 2005 met (% version): deletions (cross-outs), additions (bold red)

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DRAFT DRAFT DRAFT

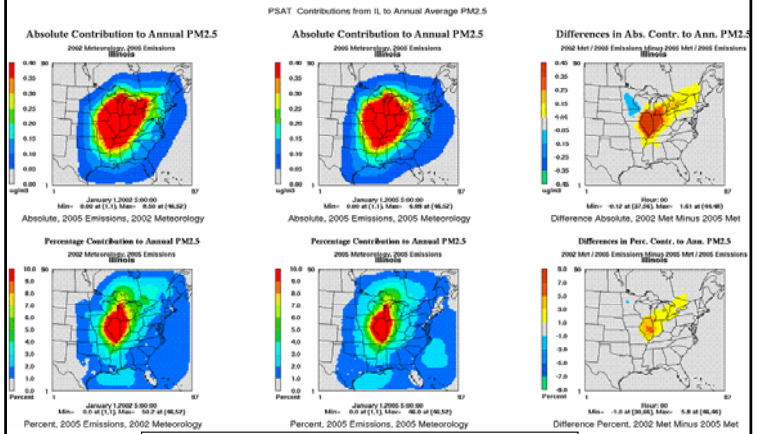
$PM_{2.5}$ Daily: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Midwest					
* Chicago, IL	IL, IN, MI, OH, WI, IA, MO, KY, PA, CAN	IL, IN, MI, OH, WI, IA, MO, KY	IL, IN, MI, OH, WI, MO	IL, IN, MI	IL, IN, MI
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, ND, MO, PA, CAN	IL, IN, OH, MI, WI, IA, MN, MO	IL, IN, OH, MI, IA, MO	IL, OH, MO	IL, MO
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IN, MI, OH, PA, NY, CAN	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Detroit, MI	IL, IN, MI, OH, WI, IA, MO,TN, KY, WV, PA, NY, CAN	IL, IN, MI, OH, KY, PA, CAN	IL, IN, MI, OH, KY, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN
* Milwaukee, WI	IL, IN, MI, OH, WI, IA, MN, MO, CAN	IL, IN, MI, WI, IA, MN, MO	IL, IN, MI, WI	IL, IN, MI, WI	IL, WI
Northeast					
* Baltimore, MD	IN, OH, NC, VA, WV, MD, DE, PA, NY, NJ, KY, CT/RI, MA, CAN	OH, VA, WV, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	VA, MD, PA, NY	VA, MD, PA
* Lancaster, PA	IN, MI, OH, NC, VA, WV, MD, DE, PA, NY, NJ, CT/RI, MA, CAN	OH, VA, WV, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	MD, PA, NY
* Liberty-Clairton, PA	IL, IN, MI, OH, KY, WV, PA, NY, VA, MD, CAN	IN, MI, OH, KY, WV, PA, NY	MI, OH, KY, WV, PA	OH, WV, PA	OH, WV, PA
* New York, NY	IN, MI, OH, VA, WV, MD, PA, NY, NJ, MA, CT/RI, DE, NC, CAN	OH, VA, MD, PA, NY, NJ, MA, CT/RI	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 "C"
2005 met

63

2002 v. 2005 Meteorology



Key Findings:
- 2002 and 2005 transport patterns similar
- 2002 met produces higher concentrations compared to 2005 met

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$PM_{2.5}$ Daily: Contributing States (ug/m^3)

	>0.35	>0.75	>1.05	>1.5	>1.75
Midwest					
* Chicago, IL	IL, IN, MI, OH, WI, IA, MO, KY, PA, CAN, **TN**	IL, IN, MI, OH, WI, IA, MO, KY	IL, IN, MI, OH, WI, MO, **IA**	IL, IN, MI	IL, IN, MI
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, ND, MO, PA, CAN	IL, IN, OH, MI, WI, IA, MN, MO	IL, IN, OH, MI, IA, MO	IL, OH, MO	IL, MO
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IN, MI, OH, PA, NY, CAN, **WV**	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Detroit, MI	IL, IN, MI, OH, WI, IA, MO,TN, KY, WV, PA, NY, CAN	IL, IN, MI, OH, KY, PA, CAN, **MO**	IL, IN, MI, OH, KY, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN
* Milwaukee, WI	IL, IN, MI, OH, WI, IA, MN, MO, CAN, **KY**	IL, IN, MI, WI, IA, MN, MO	IL, IN, MI, WI, **IA, MO**	IL, IN, MI, WI	IL, WI, **MI**
Northeast					
* Baltimore, MD	IN, OH, NC, VA, WV, MD, DE, PA, NY, NJ, KY, CT/RI, MA, CAN, **MI**	OH, VA, WV, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	VA, MD, PA, NY	VA, MD, PA
* Lancaster, PA	IN, MI, OH, NC, VA, WV, MD, DE, PA, NY, NJ, CT/RI, MA, CAN, **KY**	OH, VA, MD, PA, NY, NJ, **WV**	VA, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	MD, PA, NY
* Liberty-Clairton, PA	IL, IN, MI, OH, KY, WV, PA, NY, VA, MD, CAN	IN, MI, OH, KY, WV, PA, NY	~~IN, MI~~, OH, KY, WV, PA	OH, WV, PA	OH, WV, PA
* New York, NY	IN, MI, OH, VA, WV, MD, PA, NY, NJ, MA, CT/RI, DE, NC, CAN, **IL, KY**	OH, VA, MD, PA, NY, NJ, MA, CT/RI	PA, NY, NJ, **VA, MD**	PA, NY, NJ	PA, NY, NJ

2012 "C"
2005 met

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DRAFT DRAFT DRAFT

Ozone: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	AL, MS, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC, TN	AL, GA, SC, TN	AL, GA	AL, GA
* Charlotte, NC	IN, OH, AL, GA, SC, NC, TN, KY, VA, WV, PA	SC, NC, TN, KY, VA	SC, NC, TN, VA	SC, NC, TN, VA	SC, NC
Midwest					
* Chicago, IL (Kenosha, WI)	IL, IN, OH, MI, WI, IA, MO, KY, CAN	IL, IN, MI, OH, WI, MO, KY, CAN	IL, IN, MI, OH, WI, MO	IL, IN, MI, WI	IL, IN, MI, WI
* Holland, MI	IL, IN, OH, MI, WI, IA, MO, TN, KY, WV, PA, CAN	IL, IN, OH, MI, WI, MO	IL, IN, OH, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI, MO
* St. Louis, MO	IL, IN, OH, MI, MO, MS, KY, TN	IL, IN, OH, MO, TN, MY	IL, IN, MO, KY	IL, IN, MO	IL, MO
* Cleveland, OH	IL, IN, OH, MI, MO, NC, TN, KY, VA, WV, MD, PA, NY, CAN	IL, IN, OH, MI, KY, VA, WV, PA, CAN	IN, OH, MI, KY, PA, CAN	IN, OH, MI, KY, PA, CAN	IN, OH, MI, PA
* Sheboygan, WI	IL, IN, OH, MI, WI, IA, MO, TN, KY, VA, WV, PA, CAN	IL, IN, OH MI, WI, MO, KY	IL, IN, OH, MI, WI, MO, KY	IL, IN, MI, WI	IL, IN, WI
Northeast					
* Washington, DC	IN, OH, MI, NC, TN, KY, VA, WV, MD, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NY	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Baltimore, MD	IN, OH, MI, NC, TN, KY, VA, WWV, MO, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NJ	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Philapelphia, PA	IN, OH, MI, NC, KY, VA, WV, MD, DE, PA, NJ, NY, CAN	OH, VA, MD, DE, PA, NJ, NY, CAN	VA, MD, DE, PA, NJ, NY	VA, MD, NY, PA, NJ	PA, NJ
* Springfield, MA	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, VA, PA, NJ, NY, CT/RI, VA	PA, NJ, NY, CT/RI, MA	PA, NJ, NY, CT/RI, MA
* Greater Connecticut	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	VA, PA, NJ, NV, CT/RI	PA, NJ, NY, CT/RI
* New York, NY (Danbury, CT)	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI

2012 "C"
2005 met

Key Findings

- Model Performance
  - PM2.5: Generally reasonable, although organic carbon substantially underestimated, (summer) sulfate underestimated, and (winter) nitrate slightly overestimated
  - Ozone: Generally reasonable (mostly within ±15%)
- Attainment
  - Only a few areas not meeting PM2.5 and 85 ppb ozone standards; lots of areas not meeting for 75 ppb ozone standard
  - Additional EGU emission reductions effective in lowering PM2.5 and ozone
- Source Apportionment
  - Source Regions: "Home" state generally has the largest impact; neighbor states generally have next largest impact (i.e., impacts decrease with distance)
  - Source Sectors: Mobile sources dominate for ozone, point/mobile/area all important for PM2.5
  - Similar "linkages" with either a relative or absolute metric, and a lower significance threshold brings in more states
- Other:
  - Despite differences in meteorology, 2002 and 2005 meteorology produce similar results (with higher concentrations for 2002)

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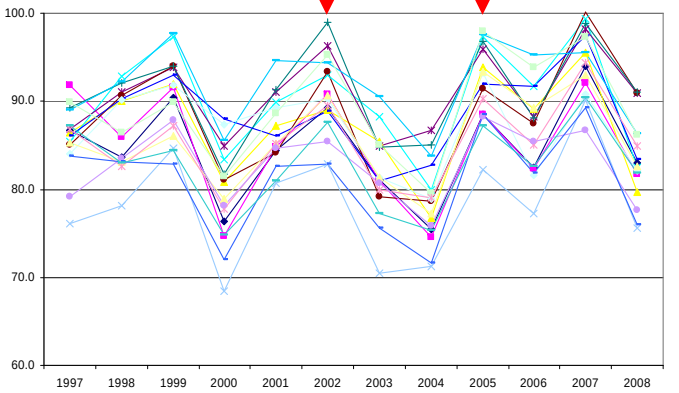
Ozone: Contributing States (ppb)

	>0.85	>1.70	>2.55	>3.40	>4.25
Southeast					
* Atlanta, GA	AL, MS, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC, TN	AL, GA, SC, TN, NC	AL, GA, TN	AL, GA
* Charlotte, NC	IN, OH, AL, GA, SC, NC, TN, KY, VA, WV, PA	SC, NC, TN, KY, VA	SC, NC, TN, VA	SC, NC, TN, VA	SC, NC
Midwest					
* Chicago, IL (Kenosha, WI)	IL, IN, OH, MI, WI, IA, MO, KY, CAN	IL, IN, MI, OH, WI, MO, KY, CAN	IL, IN, MI, OH, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI
* Holland, MI	IL, IN, OH, MI, WI, IA, MO, TN, KY, WV, PA, CAN	IL, IN, OH, MI, WI, MO	IL, IN, OH, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI, MO
* St. Louis, MO	IL, IN, OH, MI, MO, MS, KY, TN	IL, IN, OH, MO, TN, MY	IL, IN, MO, KY	IL, IN, MO	IL, MO
* Cleveland, OH	IL, IN, OH, MI, MO, NC, TN, KY, VA, WV, MD, PA, NY, CAN	IL, IN, OH, MI, KY, VA, WV, PA, CAN	IN, OH, MI, KY, PA, CAN, IL	IN, OH, MI, KY, PA, CAN	IN, OH, MI, PA
* Sheboygan, WI	IL, IN, OH, MI, WI, IA, MO, TN, KY, VA, WV, PA, CAN	IL, IN, OH MI, WI, MO, KY	IL, IN, OH, MI, WI, MO, KY	IL, IN, MI, WI	IL, IN, WI
Northeast					
* Washington, DC	IN, OH, MI, NC, TN, KY, VA, WV, MD, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NY, CAN	OH, VA, WV, MD, PA, NC	VA, MD, PA	VA, MD, PA
* Baltimore, MD	IN, OH, MI, NC, TN, KY, VA, WWV, MO, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NJ	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Philapelphia, PA	IN, OH, MI, NC, KY, VA, WV, MD, DE, PA, NJ, NY, CAN	OH, VA, MD, DE, PA, NJ, NY, CAN, WV	VA, MD, DE, PA, NJ, NY	VA, MD, NY, PA, NJ	PA, NJ, NY
* Springfield, MA	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, VA, PA, NJ, NY, CT/RI, VA	PA, NJ, NY, CT/RI, MA	PA, NJ, NY, CT/RI, MA
* Greater Connecticut	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	VA, PA, NJ, NV, CT/RI	PA, NJ, NY, CT/RI
* New York, NY (Danbury, CT)	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI, CAN	PA, NJ, NY, CT/RI, VA	PA, NJ, NY, CT/RI

2012 "C"
2005 met

Supplemental Information


100.0
90.0
80.0
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2008

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Regional Modeling in the Eastern U.S.: Preliminary Results

April 28, 2009

CAUTION!

This modeling provides, at best, ballpark estimates and is meant only to be directionally correct. It is not intended for regulatory or legal purposes.

Overview of Today's Presentation

- Attainment Analyses
  - Base Scenario ("C")
  - EGU Control Scenarios ("E" and "F")
- Areas of Interest
- Source Apportionment Analyses

Model Results

Attainment Test

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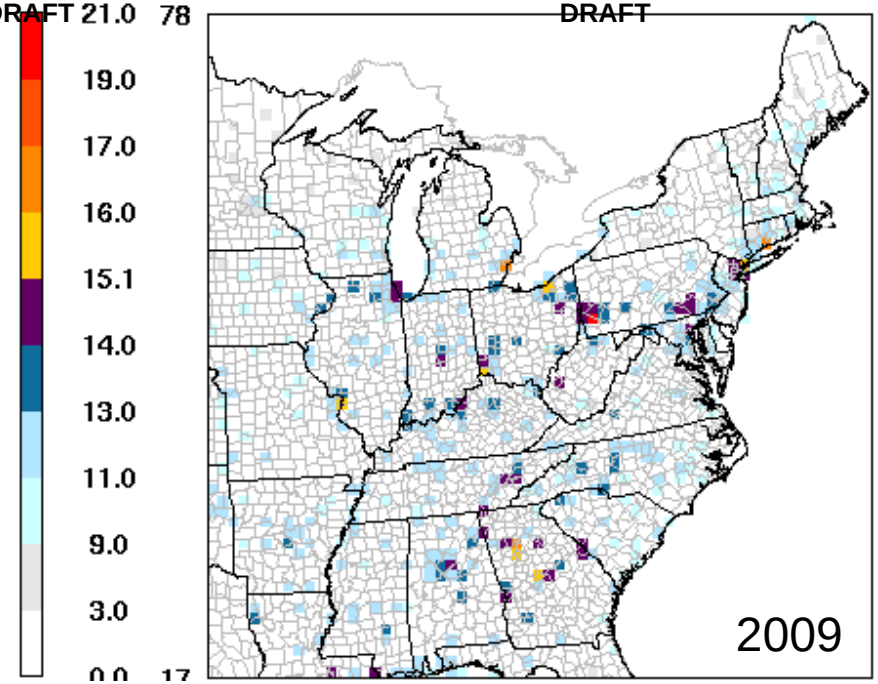
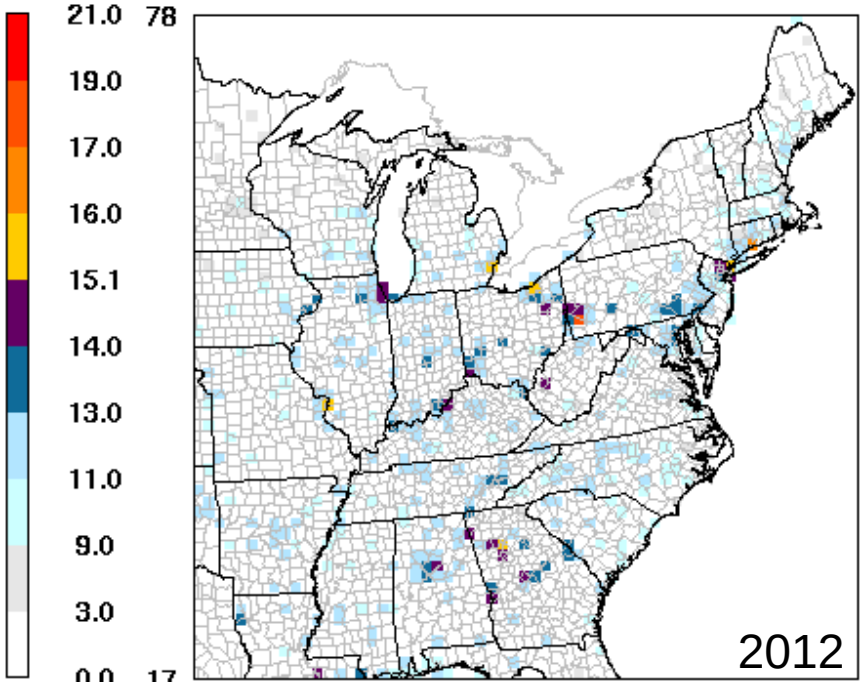
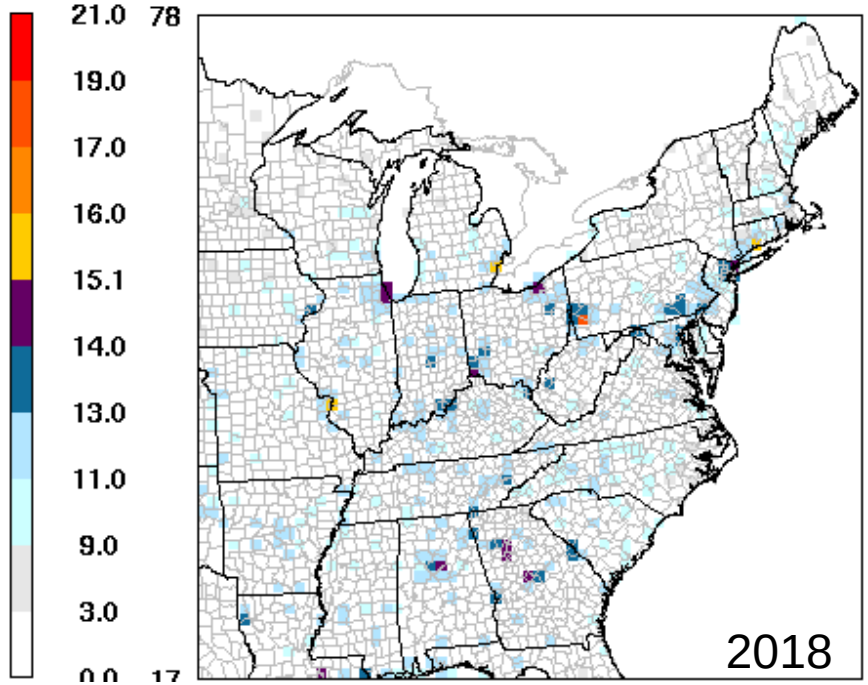
$PM_{2.5}$ Annual Concentrations

Annual (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	4	3	2	9
2012	3	1	2	6
2018	2	0	1	3







Based on 2005 meteorology

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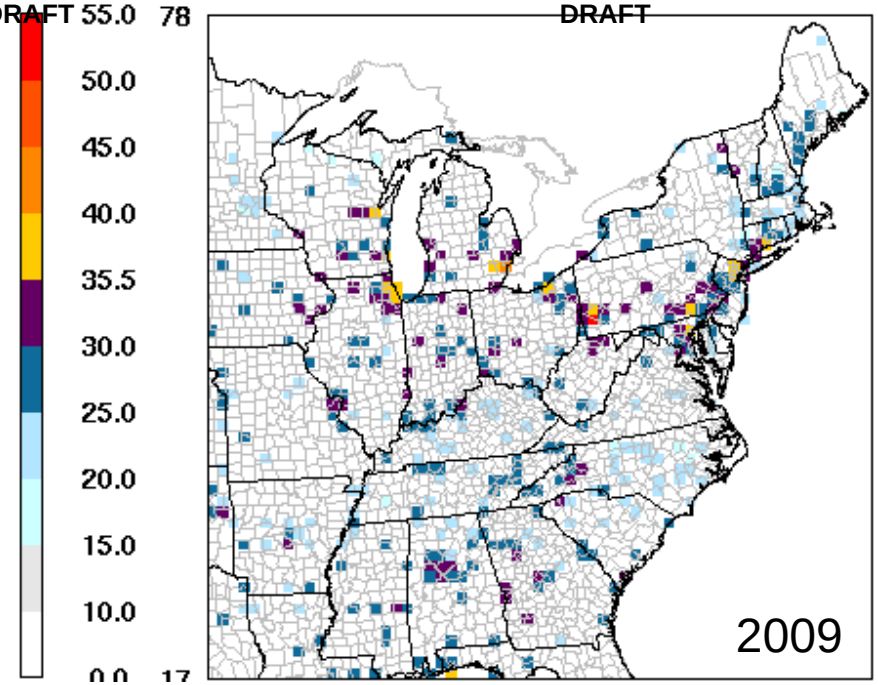
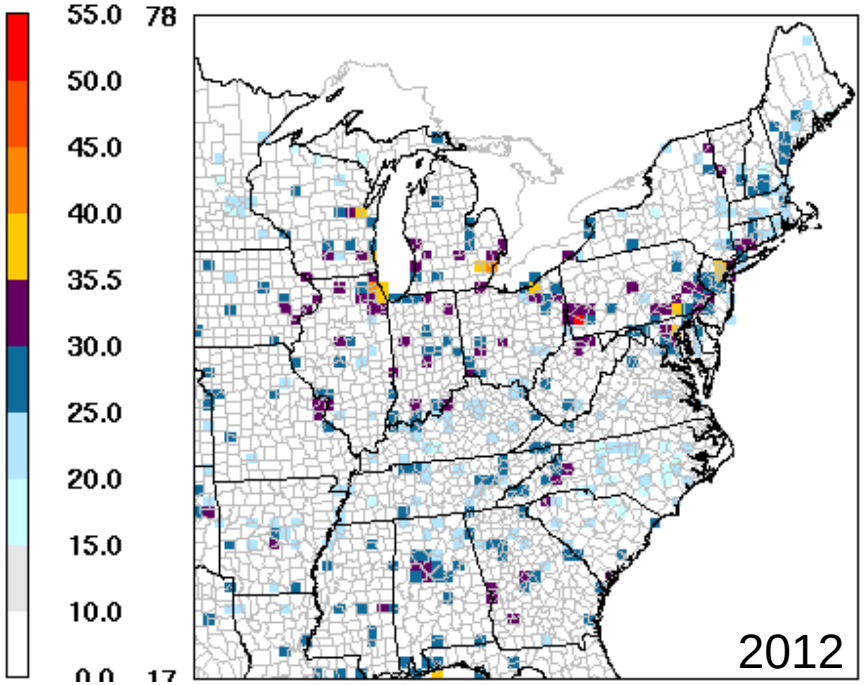
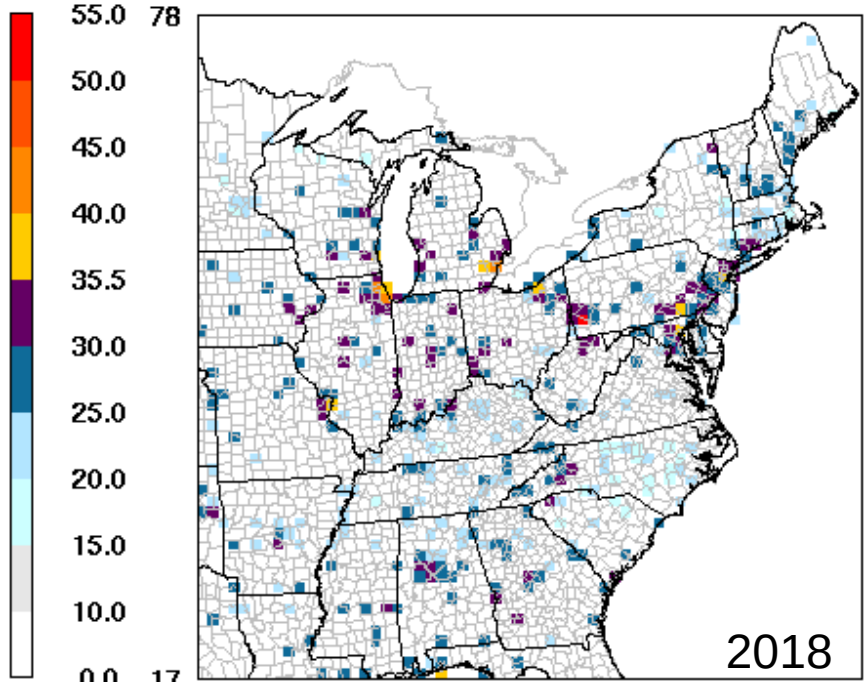
$PM_{2.5}$ Daily Concentrations

Daily (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	6	0	6	12
2012	6	0	5	11
2018	6	0	4	10





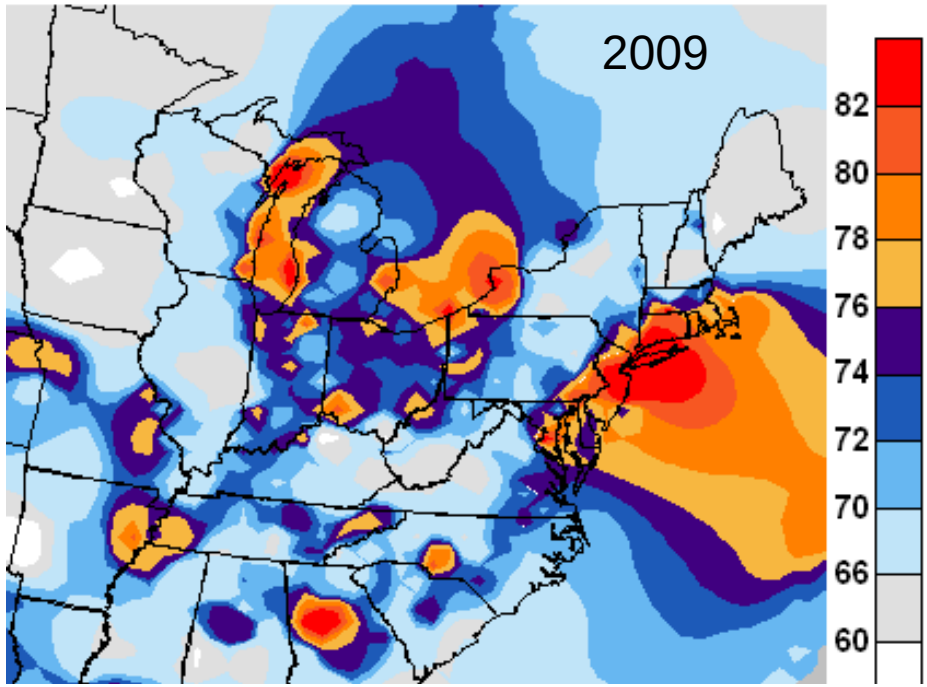


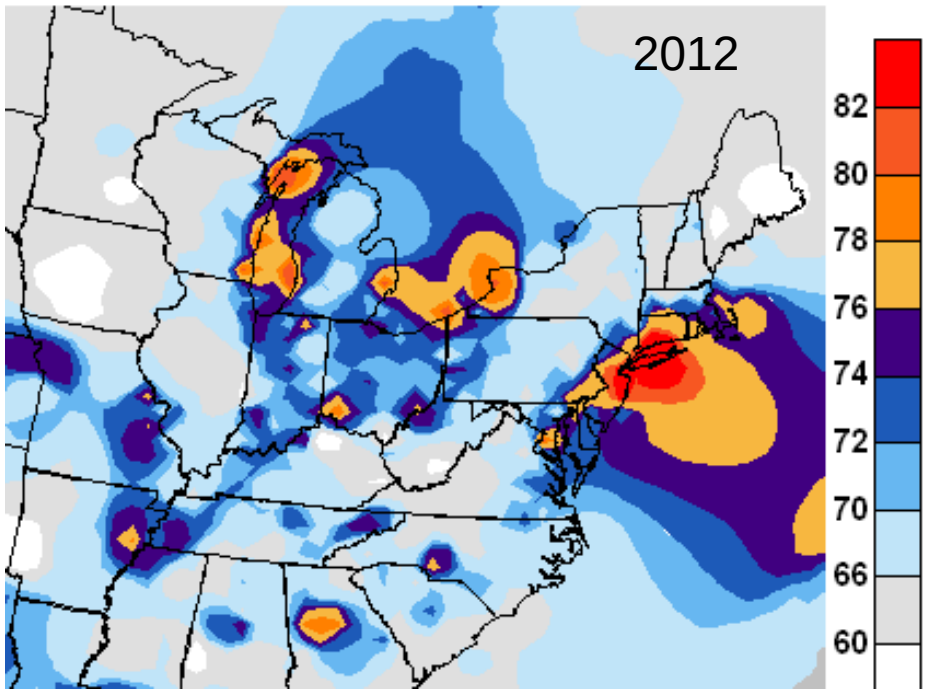
Based on 2005 meteorology

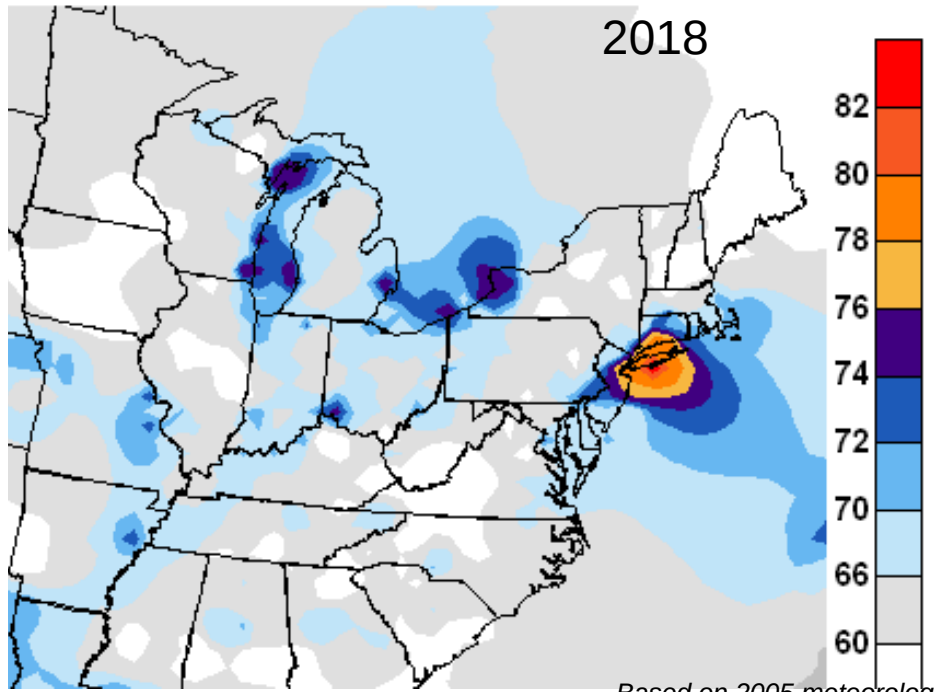
DRAFT
DRAFT

Ozone 8-Hour Concentrations

8-Hour - 0.08 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	1	1	8	10
2012	0	0	3	3
2018	0	0	0	0
8-Hour - 0.075 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	50	31	66	147
2012	30	14	45	89
2018	8	2	13	23



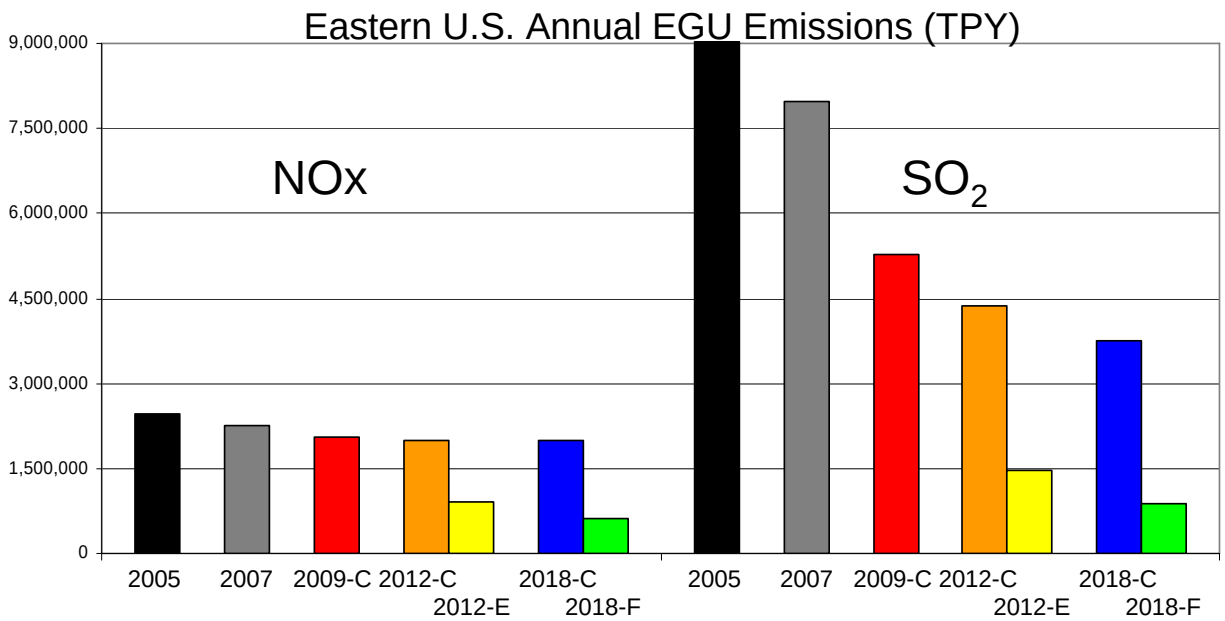




Based on 2005 meteorology

EGU Control Strategies

	Scenario E (2012)	Scenario F (2018)
NOx	0.125 lb/MMBTU	0.07
SO_2	0.25	0.10



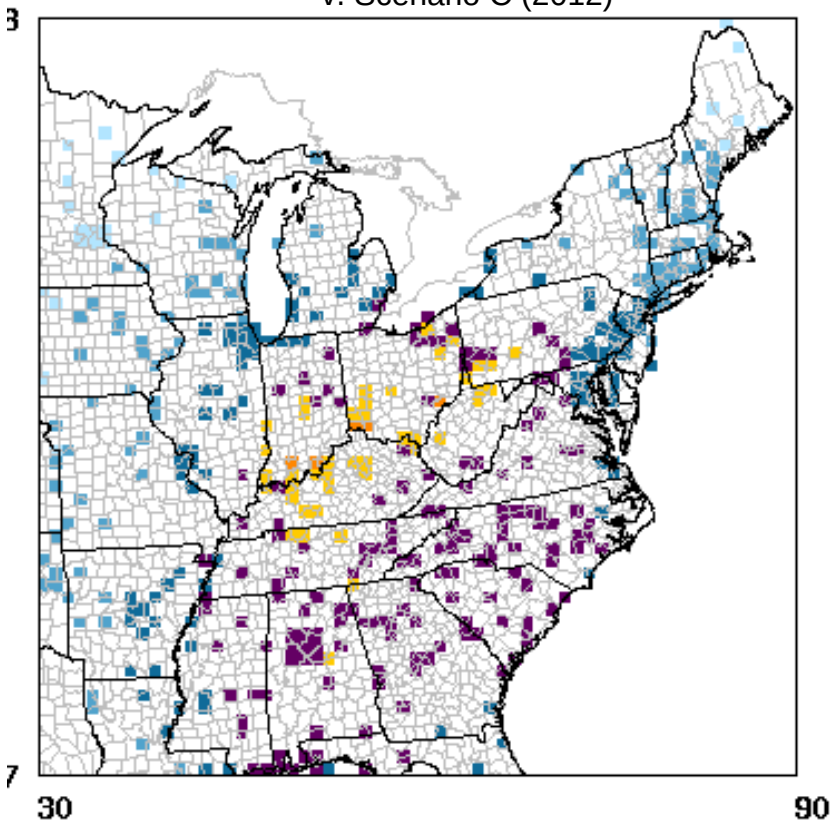
Reference: "Options for EGU Controls in the Eastern U.S.: White Paper", October 3, 2008, State Collaborative Technical Workgroup

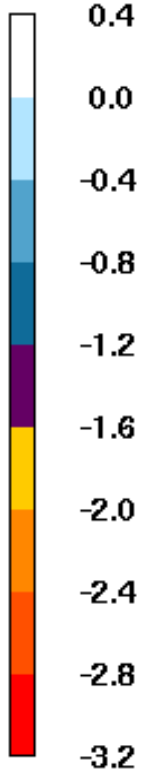
$PM_{2.5}$ Annual: Air Quality Improvement

(relative to Scenario C)

Scenario E (2012)

v. Scenario C (2012)

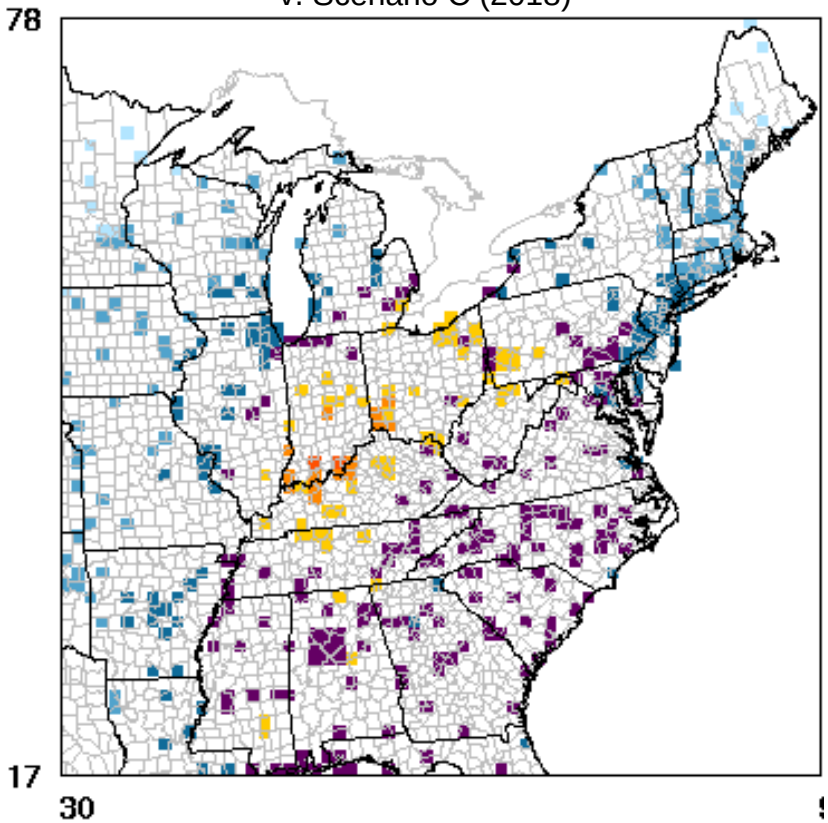




October 1,2005 0:00:00
Min= -2.2 at (52,42), Max= -0.2 at (86,76)

Scenario F (2018)

v. Scenario C (2018)



October 1,2005 0:00:00
Min= -2.6 at (52,42), Max= -0.2 at (86,76)

Average Improvement: $PM_{2.5}$ Annual = 1.0 ug/m3 (Scen. E); 1.1 ug/m3 (Scen. F)

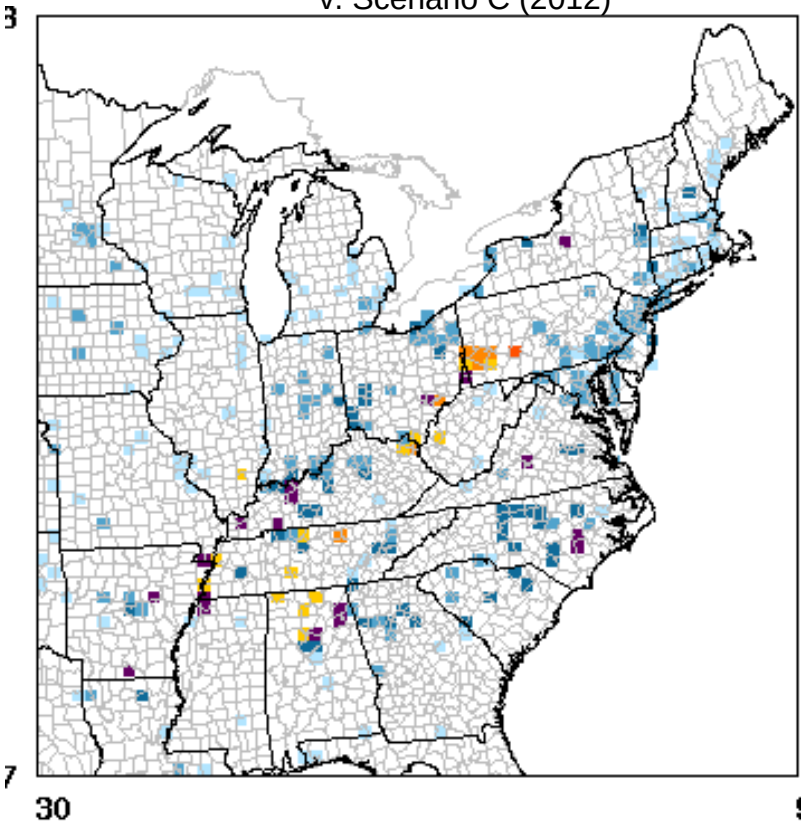
Based on 2005 meteorology

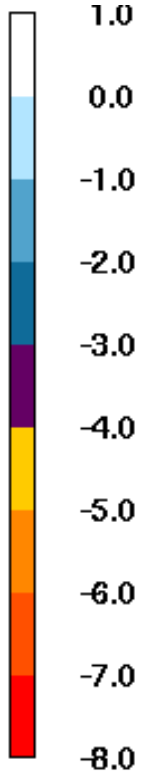
$PM_{2.5}$ Daily: Air Quality Improvement

(relative to Scenario C)

Scenario E (2012)

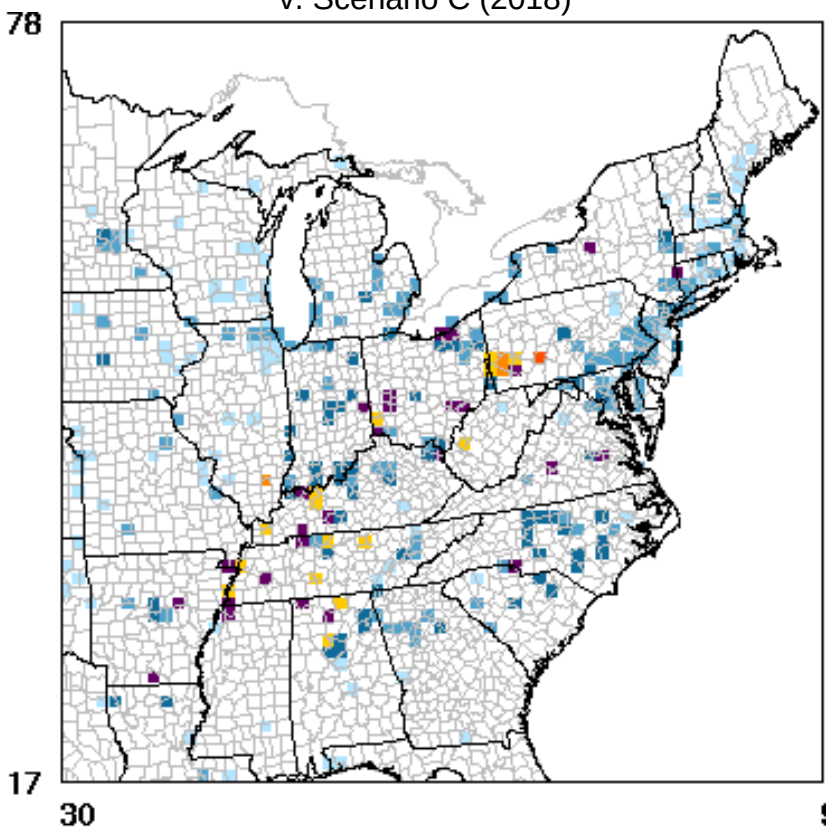
v. Scenario C (2012)





Scenario F (2018)

v. Scenario C (2018)



Average Improvement: $PM_{2.5}$ Daily = 1.1 ug/m3 (Scen. E); 1.3 ug/m3 (Scen. F)

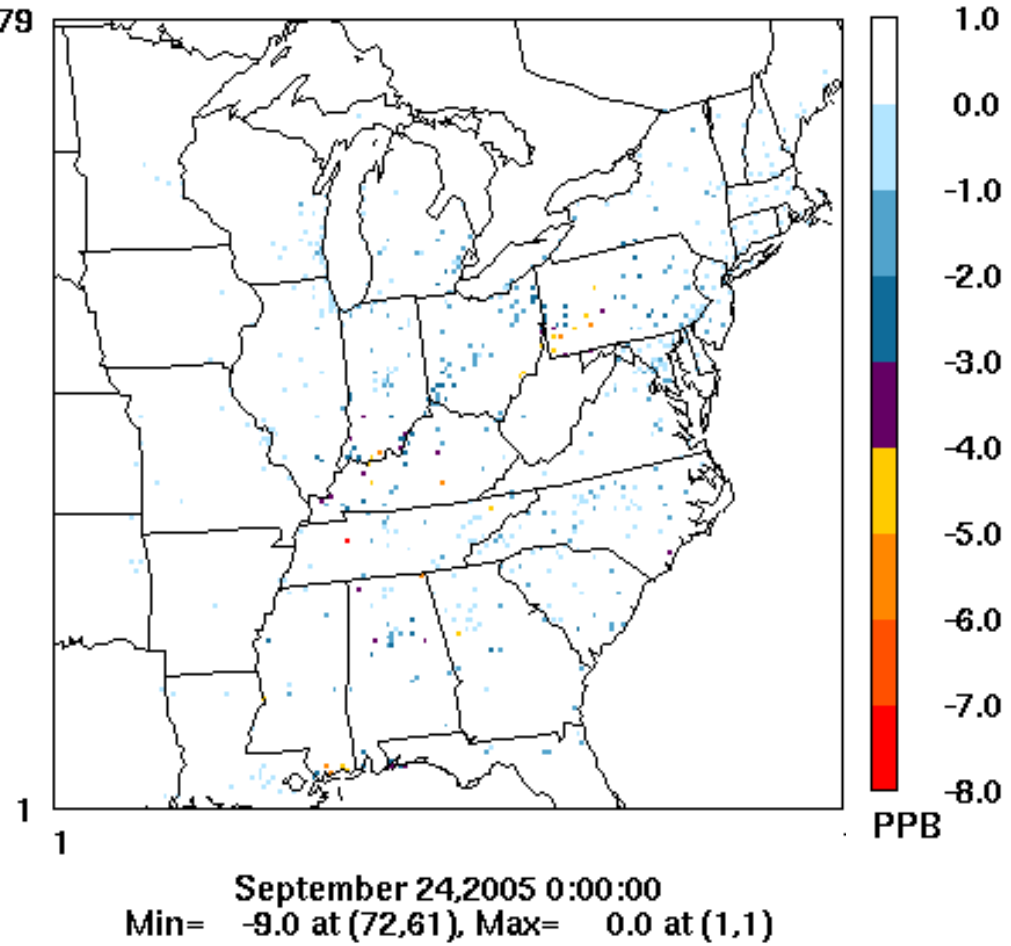
Based on 2005 meteorology

Ozone: Air Quality Improvement

(relative to Scenario C)

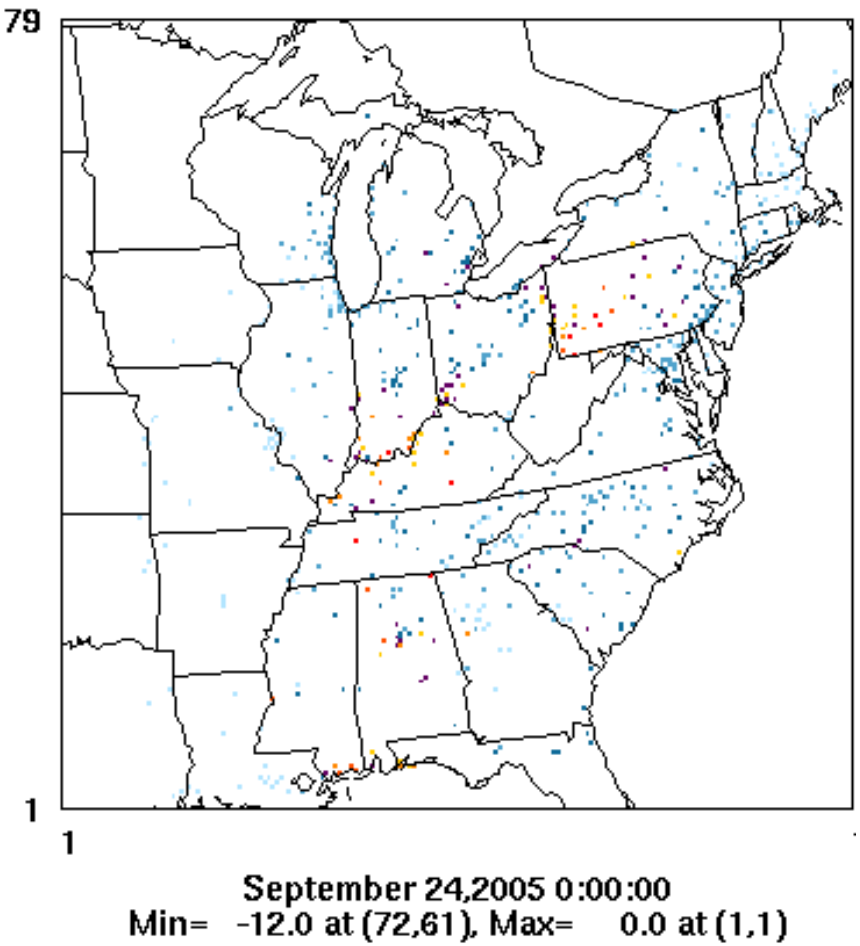
Scenario E (2012)

v. Scenario C (2012)



Scenario F (2018)

v. Scenario C (2018)



Average Improvement: Ozone = 1.6 ppb (Scen. E); 2.4 ppb (Scen. F)

Based on 2005 meteorology

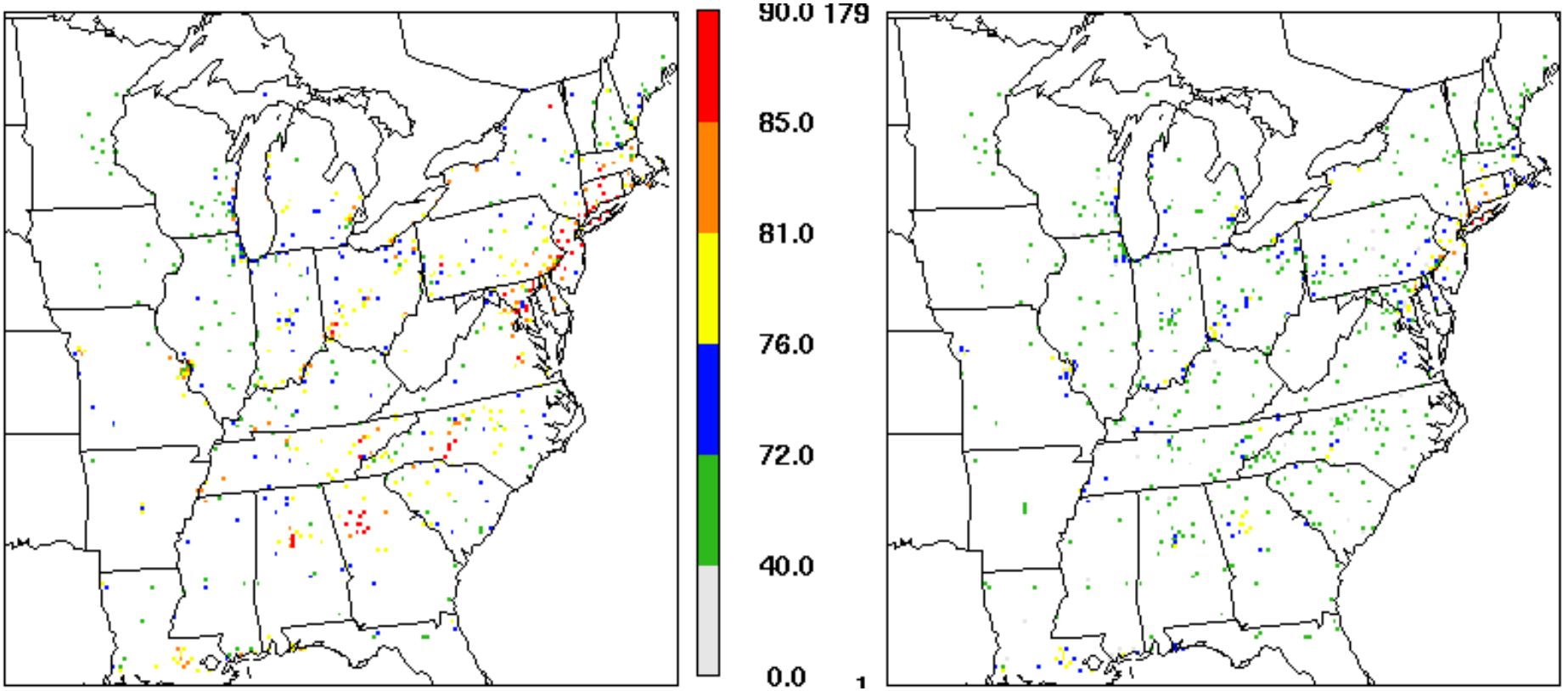
Areas of Interest

Proposed Areas of Interest

- Significance Contribution Test
  - Current (’06-’08) monitored design value > NAAQS, and/or
  - 2009, 2012, or 2018 modeled value > NAAQS
- Interference with Maintenance Test
  - Current (’06-’08) monitored design value > 0.95 x NAAQS, and/or
  - 2009, 2012, or 2018 modeled value > 0.95 x NAAQS

2012 Ozone

Mon or Mod



Mon and Mod

based on 2006-2008 monitoring data

$PM_{2.5}$ Areas of Interest

(based on criteria for significant contribution)

			Annual				Daily	
Southeast		**2009**	**2012**	**2018**		**2009**	**2012**	**2018**
GA	Atlanta	X	X					
	Macon	X						
Midwest								
IL	Granite City	X	X	X				X
	Chicago					X	X	X
MI	Detroit	X	X	X		X	X	X
OH	Cincinnati	X						
	Cleveland	X	X			X	X	X
WI	Milwaukee					X	X	X
Northeast								
NY	New York	X	X			X	X	X
MD	Baltimore					X	X	X
PA	Lancaster					X	X	X
	Liberty-Clairton	X	X	X		X	X	X

Ozone Areas of Interest

(based on criteria for significant contribution)

		0.08 ppm NAAQS			0.075 ppm NAAQS		
Southeast		**2009**	**2012**	**2018**	**2009**	**2012**	**2018**
GA	Atlanta	X			X	X	
NC	Charlotte				X	X	
TN	Knoxville				X		
	Memphis				X	X	
Midwest							
IL	Chicago				X		
MI	Detroit				X	X	X
	Allegan	X			X	X	X
OH	Cincinnati				X	X	X
	Cleveland				X	X	X
	Columbus				X	X	
WI	Milwaukee				X	X	X
	Manitowoc				X	X	
	Sheboygan				X	X	
	Door County				X	X	
MO	St.Louis				X	X	X
Northeast							
DC	Washington				X	X	
CT	Greater CT	X			X	X	
MD	Baltimore	X	X		X	X	X
MA	Boston-Lawrence				X	X	
	Springfield				X	X	
NY	New York City	X	X		X	X	X
	Rochester				X	X	
	Poughkeepsie				X	X	
	Jamestown				X	X	
	Buffalo				X	X	
PA	Clearfield				X		
	Philadelphia	X			X	X	X
	Pittsburgh				X		
RI	Providence				X	X	
					+29	***+16***	***+3***
					no. additional counties		

Model Results

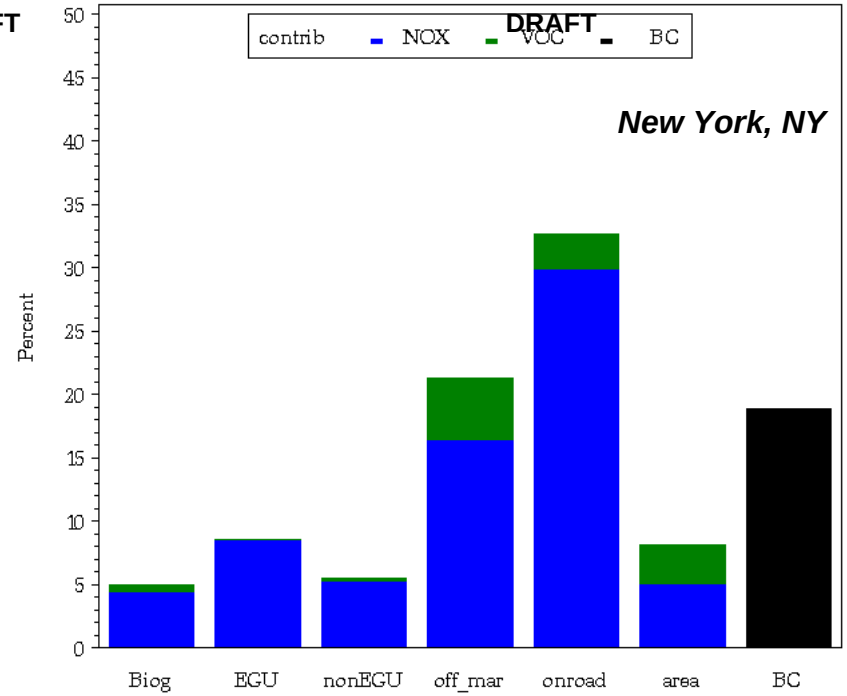
Source Apportionment

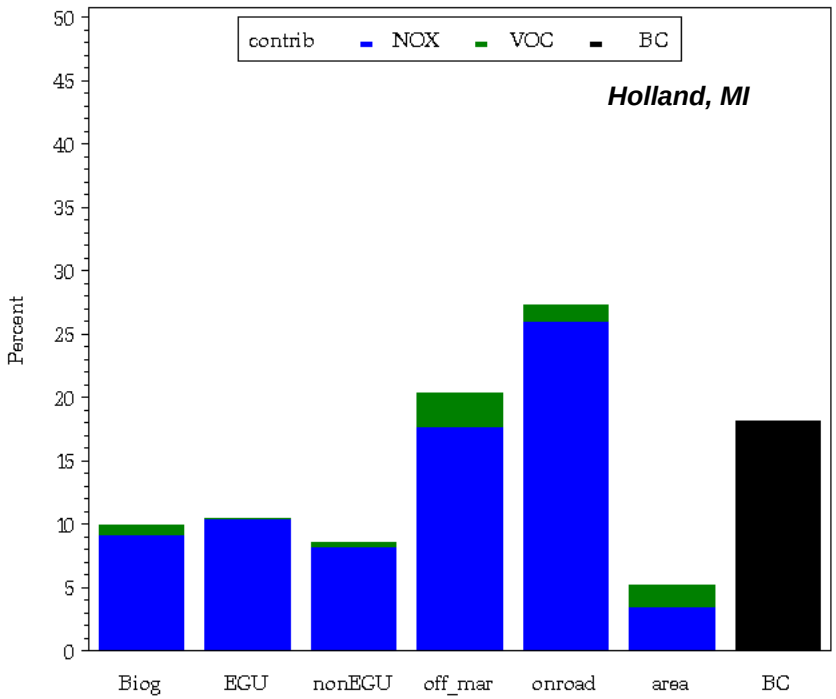
DRAFT
DRAFT

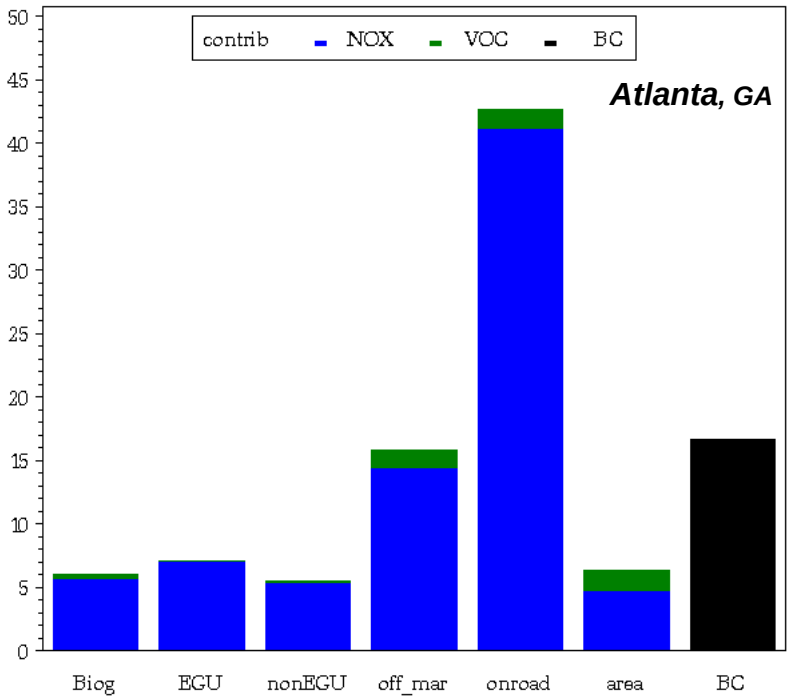
Ozone Source Apportionment Results: Source Sectors

(2005 base)

Key Finding: Contributions dominated by mobile sources (at least 60%)



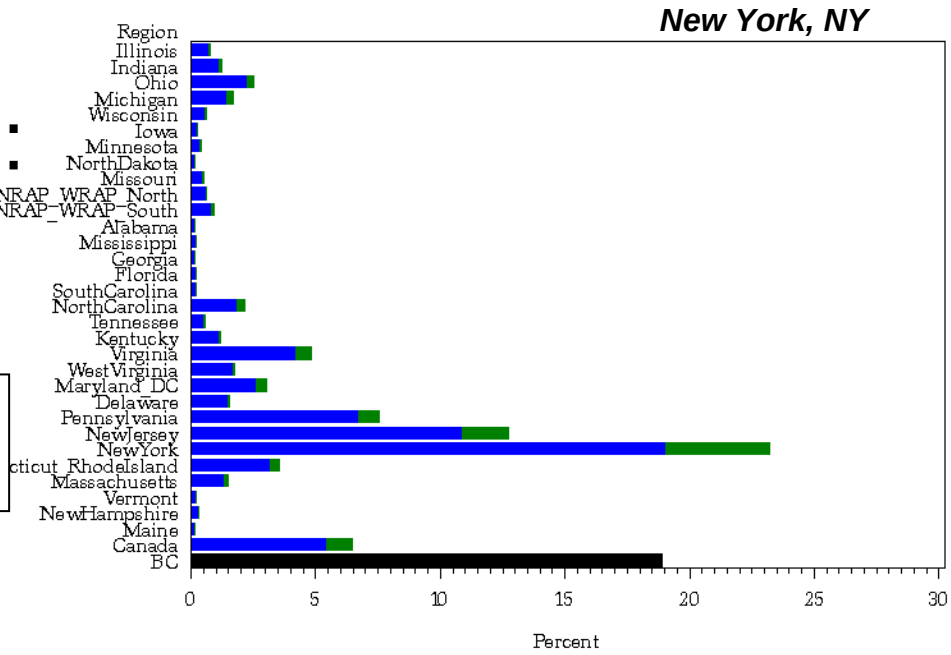


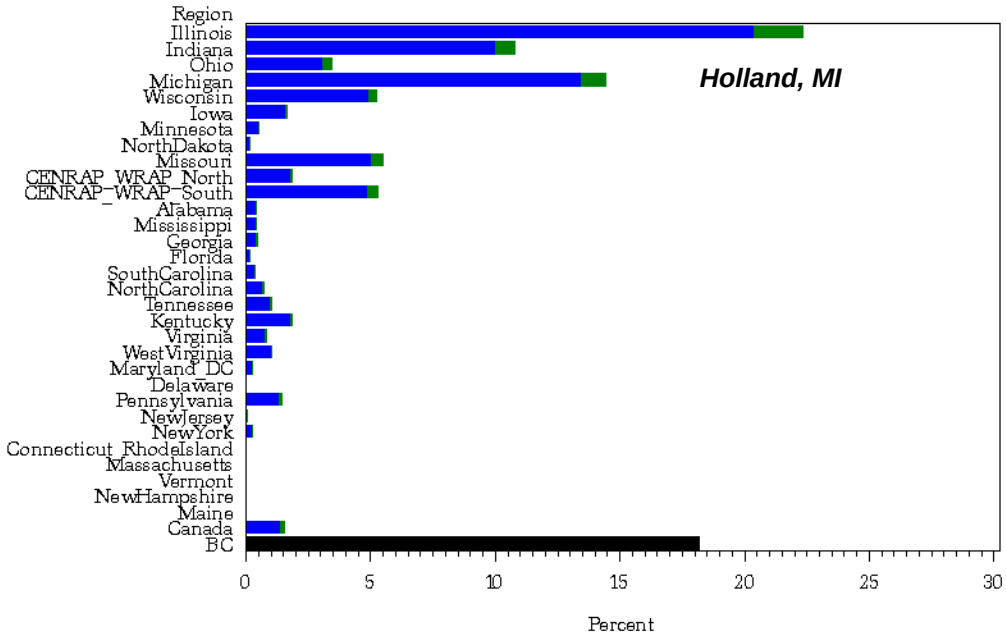


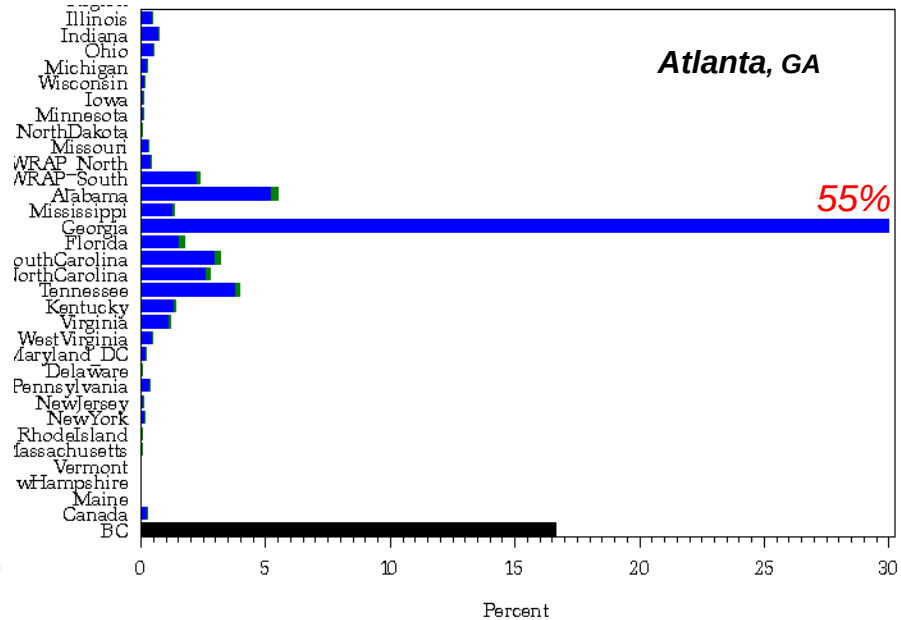
Ozone Source Apportionment Results: Source Regions

(2005 base)

Key Finding: Contributions dominated by "home" state and neighboring states







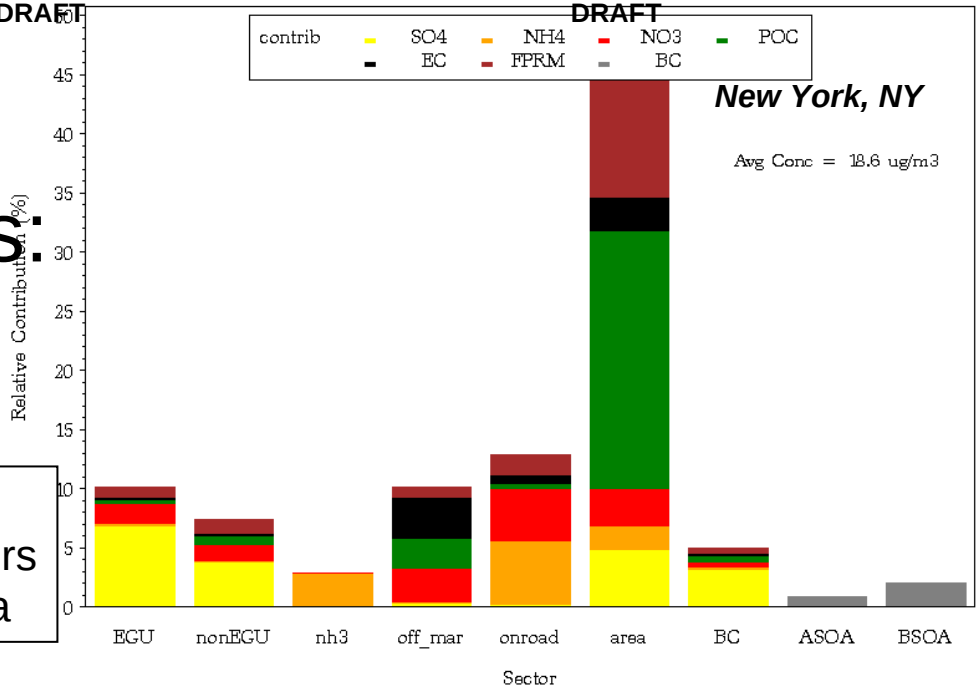
Based on 2005 meteorology

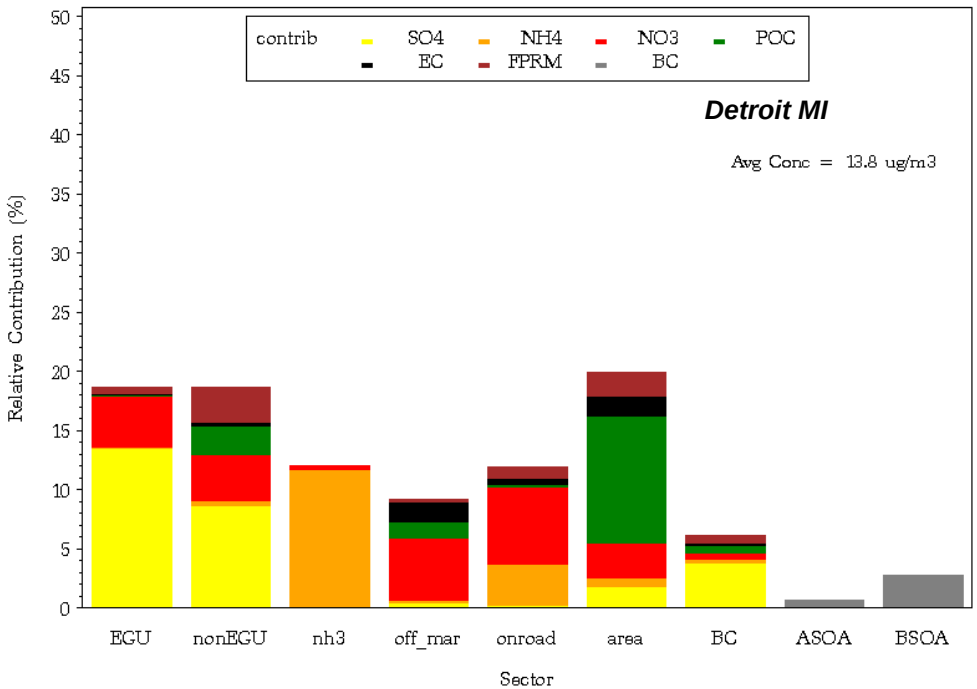
DRAFT
DRAFT

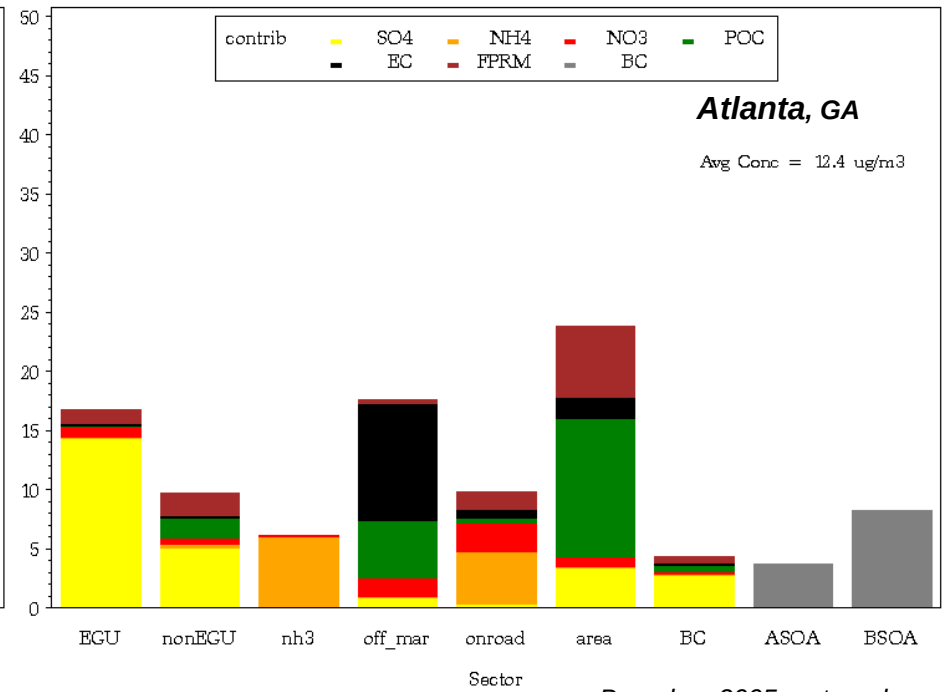
$PM_{2.5}$ Annual Source Apportionment Results: Source Sectors

(2012 Scenario C)

Key Findings:
- All source categories are important contributors
- Relative amount of contribution varies by area





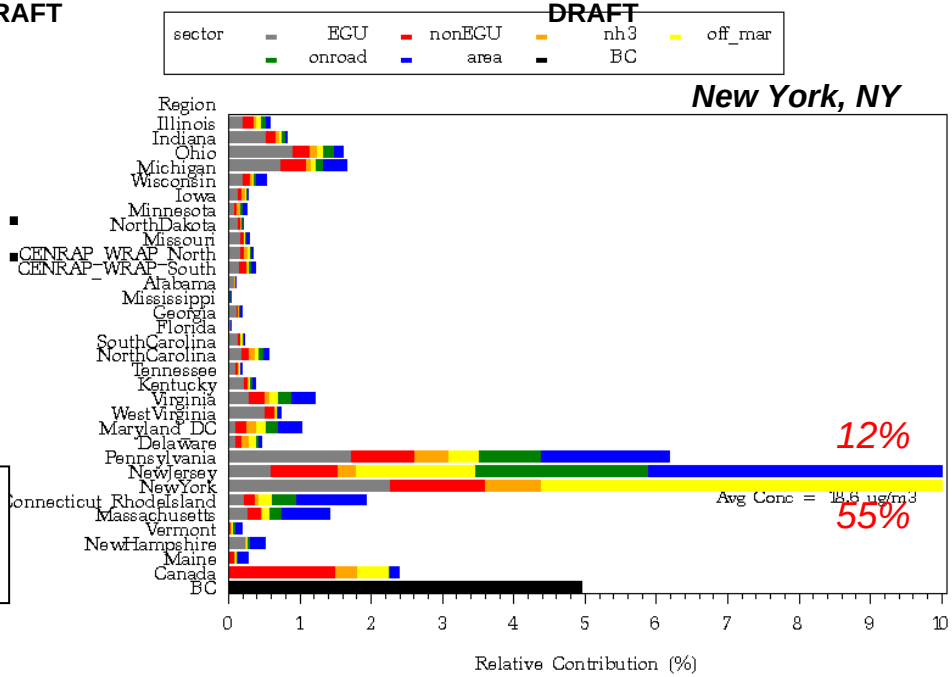


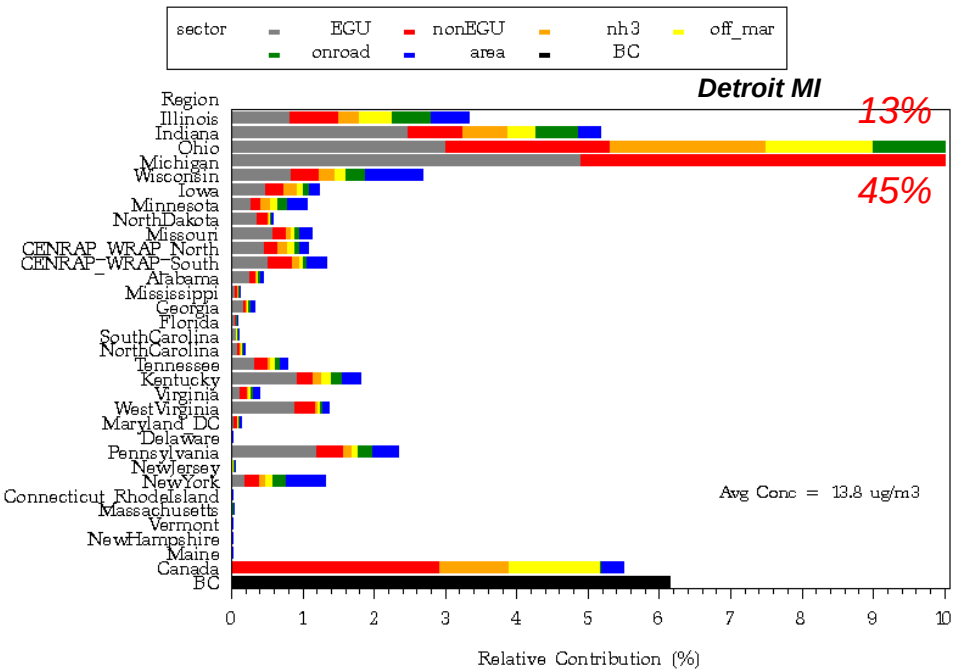
Based on 2005 meteorology

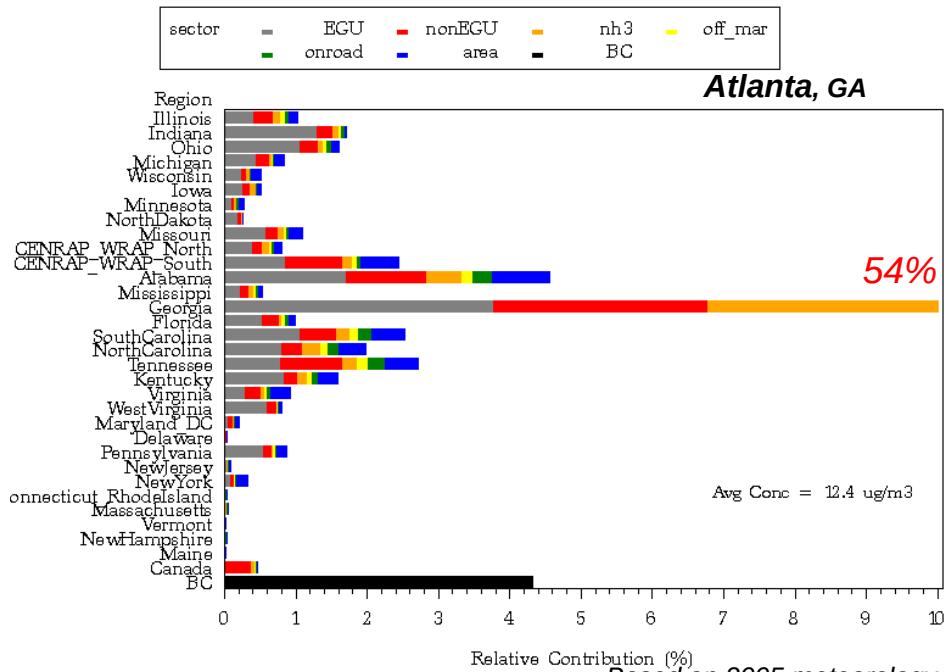
$PM_{2.5}$ Annual Source Apportionment Results: Source Regions

(2012 Scenario C)

Key Finding: Contributions dominated by "home" state and neighboring states







Based on 2005 meteorology

Average Contributions

	In-State	Out-State		Total						Out-of-state Contribution				
	%	%		1%	2%	3%	4%	5%		1%	2%	3%	4%	5%
PM2.5-Annual														
2005	40	60		94	86	77	71	67		89	75	58	50	42
2012	43	57		94	85	77	72	68		89	72	58	49	42
PM2.5-Daily														
2005	38	62		95	89	83	78	75		91	82	71	63	57
2012	43	57		95	90	83	78	74		91	81	70	60	52
Ozone														
2005	25	75		93	83	76	69	64		90	77	66	57	50
2012														

Based on 20-30 key monitors in NE, SE, and MW

$PM_{2.5}$ Annual: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	IN, OH, MO, AL, GA. SC, NC, TN, KY	AL, GA, SC, TN	AL, GA	AL, GA	GA
* Macon, GA	IL, IN, MI, OH, MO, AL, GA, FL, SC, NC, TN, KY, VA, WV, PA	AL, GA, FL, SC, NC, TN	AL, GA, SC	AL, GA	GA
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WV, PA, CAN	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, AL, TN, KY, WV, PA, CAN	IL, IN, MI, OH, TN, KY, WV, PA, CAN	IL, IN, MI, OH, KY	IN, MI, OH, KY	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WI, PA, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN	IN, MI, OH, CAN
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, MI, IA, MO	IL, IN, MO	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, NY,CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, KY, WV, PA	MI, OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT/RI, MA, CAN	PA, NY, NJ, CAN	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 “C”
2005 met

$PM_{2.5}$ Annual: Contributing States (ug/m^3)

	>0.15	>0.30	>0.45	>0.60	>0.75
Southeast					
* Atlanta, GA	IN, OH, ~~MO~~, AL, GA. SC, NC, TN, KY, ~~IL, FL~~	AL, GA, SC, TN	AL, GA, ~~TN~~	~~AL~~, GA	GA
* Macon, GA	~~IL~~, IN, ~~MI~~, OH, ~~MO~~, AL, GA, FL, SC, NC, TN, KY, VA, ~~WV, PA~~	AL, GA, ~~FL~~, SC, NC, ~~TN~~	~~AL~~, GA, ~~SC~~	~~AL~~, GA, ~~SC~~	GA
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WV, PA, CAN, **KY, NY**	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, ~~AL~~, TN, KY, WV, PA, CAN	IL, IN, MI, OH, ~~TN,~~ KY, ~~WV, PA, CAN~~	IL, IN, MI, OH, KY	IN, ~~MI~~, OH, KY	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WI, PA, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN	~~IN~~, MI, OH, CAN
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, MI, IA, MO	IL, IN, MO, **MI**	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, NY,CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, ~~KY~~, WV, PA	~~MI~~, OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT/RI, MA, CAN	PA, NY, NJ, CAN, **OH, MI, CT/RI**	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 “C”
2005 met

Changes relative to 2012 C, 2005 met (% version): deletions (cross-outs), additions (bold red)

$PM_{2.5}$ Annual: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	IN, OH, ~~MO~~, AL, GA. SC, NC, TN, KY, **FL**	AL, GA, SC, TN, **NC**	AL, GA, TN, **SC**	AL, GA	GA
* Macon, GA	IL, IN, ~~MI,~~ OH, ~~MO~~, AL, GA, FL, SC, NC, TN, KY, VA, ~~WV,~~ ~~PA~~	AL, GA, FL, SC, NC, TN, **IN**	AL, GA, SC	AL, GA, SC	GA, **AL**
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, ~~NY~~, CAN, **IA, MO, TN**	IL, IN, MI, OH, WV, PA, CAN, **KY**	IN, MI, OH, PA, CAN	MI, OH, ~~PA, CAN~~, **IN**	MI, OH, ~~PA, CAN~~
* Cincinnati, OH	IL, IN, MI, OH, WI, IA, MO, AL, TN, KY, WV, PA, CAN, **GA**	IL, IN, MI, OH, TN, KY, ~~WV, PA, CAN~~	IL, IN, MI, OH, KY	IN, MI, OH, KY, **IL**	IN, OH, KY
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, ~~WV~~, PA, ~~NY~~, CAN	IL, IN, MI, OH, WI, ~~PA,~~ CAN, **KY**	IL, IN, MI, OH, CAN	IN, MI, OH, ~~CAN~~, **IL**	IN, MI, OH, ~~CAN~~
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, ~~MI,~~ IA, MO	IL, IN, MO	IL, MO	IL, MO
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, ~~NY~~, CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, KY, WV, PA	~~MI,~~ OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT/RI, ~~MA,~~ CAN	PA, NY, NJ, ~~CAN~~	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

2012 "C"
2002 met

Changes relative to 2012 C, 2005 met (% version): deletions (cross-outs), additions (bold red)

Ozone: Contributing States (%)

	>1%	>2%	>3%	>4%	>5%
Southeast					
* Atlanta, GA	AL, MS, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC, TN	AL, GA, SC, TN	AL, GA	AL, GA
* Charlotte, NC	IN, OH, AL, GA, SC, NC, TN, KY, VA. WV, PA	SC, NC, TN, KY, VA	SC, NC, TN, VA	SC, NC, TN, VA	SC, NC
Midwest					
* Chicago, IL (Kenosha, WI)	IL, IN, OH, MI, WI, IA, MO, KY, CAN	IL, IN, MI, OH, WI, MO, KY, CAN	IL, IN, MI, OH, WI, MO	IL, IN, MI, WI	IL, IN, MI, WI
* Holland, MI	IL, IN, OH, MI, WI, IA, MO, TN, KY, WV, PA, CAN	IL, IN, OH, MI, WI, MO	IL, IN, OH, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI, MO
* St. Louis, MO	IL, IN, OH, MI, MO, MS, KY, TN	IL, IN, OH, MO, TN, MY	IL, IN, MO, KY	IL, IN, MO	IL, MO
* Cleveland, OH	IL, IN, OH, MI, MO, NC, TN, KY, VA, WV, MD, PA, NY, CAN	IL, IN, OH, MI, KY, VA, WV, PA, CAN	IN, OH, MI, KY, PA, CAN	IN, OH, MI, KY, PA, CAN	IN, OH, MI, PA
* Sheboygan, WI	IL, IN, OH, MI, WI, IA, MO, TN, KY, VA, WV, PA, CAN	IL, IN, OH MI, WI, MO, KY	IL, IN, OH, MI, WI, MO, KY	IL, IN, MI, WI	IL, IN, WI
Northeast					
* Washington, DC	IN, OH, MI, NC, TN, KY, VA, WV, MD, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NY	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Baltimore, MD	IN, OH, MI, NC, TN, KY, VA, WWV, MO, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NJ	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Philapelphia, PA	IN, OH, MI, NC, KY, VA, WV, MD, DE, PA, NJ, NY, CAN	OH, VA, MD, DE, PA, NJ, NY, CAN	VA, MD, DE, PA, NJ, NY	VA, MD, NY, PA, NJ	PA, NJ
* Springfield, MA	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, VA, PA, NJ, NY, CT/RI, VA	PA, NJ, NY, CT/RI, MA	PA, NJ, NY, CT/RI, MA
* Greater Connecticut	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/TI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI
* New York, NY (Danbury, CT)	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI

2012 “C”
2005 met

Ozone: Contributing States (ppb)

	>0.85	>1.70	>2.55	>3.40	>4.25
Southeast					
* Atlanta, GA	AL, MS, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC, TN	AL, GA, SC, TN, **NC**	AL, GA, **TN**	AL, GA
* Charlotte, NC	IN, OH, AL, GA, SC, NC, TN, KY, VA. WV, PA	SC, NC, TN, KY, VA	SC, NC, TN, VA	SC, NC, TN, VA	SC, NC
Midwest					
* Chicago, IL (Kenosha, WI)	IL, IN, OH, MI, WI, IA, MO, KY, CAN	IL, IN, MI, OH, WI, MO, KY, CAN	IL, IN, MI, OH, WI, MO	IL, IN, MI, WI, **MO**	IL, IN, MI, WI
* Holland, MI	IL, IN, OH, MI, WI, IA, MO, TN, KY, WV, PA, CAN	IL, IN, OH, MI, WI, MO	IL, IN, OH, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI, MO
* St. Louis, MO	IL, IN, OH, MI, MO, MS, KY, TN	IL, IN, OH, MO, TN, MY	IL, IN, MO, KY	IL, IN, MO	IL, MO
* Cleveland, OH	IL, IN, OH, MI, MO, NC, TN, KY, VA, WV, MD, PA, NY, CAN	IL, IN, OH, MI, KY, VA, WV, PA, CAN	IN, OH, MI, KY, PA, CAN, **IL**	IN, OH, MI, KY, PA, CAN	IN, OH, MI, PA
* Sheboygan, WI	IL, IN, OH, MI, WI, IA, MO, TN, KY, VA, WV, PA, CAN	IL, IN, OH MI, WI, MO, KY	IL, IN, OH, MI, WI, MO, KY	IL, IN, MI, WI	IL, IN, WI
Northeast					
* Washington, DC	IN, OH, MI, NC, TN, KY, VA, WV, MD, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NY, **CAN**	OH, VA, WV, MD, PA, **NC**	VA, MD, PA	VA, MD, PA
* Baltimore, MD	IN, OH, MI, NC, TN, KY, VA, WWV, MO, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NJ	OH, VA, WV, MD, PA	VA, MD, PA	VA, MD, PA
* Philapelphia, PA	IN, OH, MI, NC, KY, VA, WV, MD, DE, PA, NJ, NY, CAN	OH, VA, MD, DE, PA, NJ, NY, CAN, **WV**	VA, MD, DE, PA, NJ, NY	VA, MD, NY, PA, NJ	PA, NJ, **NY**
* Springfield, MA	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, VA, PA, NJ, NY, CT/RI, VA	PA, NJ, NY, CT/RI, MA	PA, NJ, NY, CT/RI, MA
* Greater Connecticut	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/TI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI
* New York, NY (Danbury, CT)	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI, **CAN**	PA, NJ, NY, CT/RI, **VA**	PA, NJ, NY, CT/RI

2012 “C”
2005 met

Modeling Performed in 2009 by LADCO for the State Collaborative Effort
FOR DAILY PM2.5
Met: 2005, unless noted 36 km grid CAMx

ICBC	Boundary Conditions
ASOA	Anthropogenic Secondary Organic Aerosols
BSOA	Biogenic Secondary Organic Aerosols

Nonattainment Area	Lancaster	York	Baltimore	New York-N.New Jersey-Long Island	New York City	New Haven
State(s)	PA	PA	MD	NY-NJ-CT	NY	CT
24-Hour $PM_{2.5}$ Contribution (>0.35)	1.38	1.31	1.48	15.82	5.29	1.94
Annual $PM_{2.5}$ Contribution (>0.15)	0.59	0.43	0.38	6.07	2.22	0.40

New York-N.New Jersey-Long Island
NY-NJ-CT
340390004

	24-Hour PM2.5 Contribution (>0.35)	Annual PM2.5 Contribution (>0.15)
Indiana	0.63	0.19
Ohio	1.31	0.47
Michigan	0.47	0.32
North Carolina	0.78	0.19
Virginia	1.34	0.30
West Virginia	0.61	0.17
Maryland_DC	1.21	0.28
Delaware	0.62	0.25
Pennsylvania	5.43	1.98
New Jersey	15.82	6.07
New York	5.38	2.20
Connecticut_Rhode Island	0.89	0.20
Massachusetts	0.98	0.25
Canada	0.60	0.44
Illinois	0.42	NS
CENRAP_WRAP_South	0.37	NS
Kentucky	0.47	NS

2005 DAILY	Birmingham	Atlanta	Floyd County	Macon	Hamilton	Charleston	untingon-Ashlar
	AL	GA	GA	GA	TN	WV	WV-KY-OH
	10730023	130630091	131150005	130210007	470650031	540391005	540110006
Illinois	0.16	0.09	0.01		0.01	0.47	0.00
Indiana	0.98	0.61	0.39		0.51	1.47	0.21
Ohio	3.21	1.68	3.26		5.89	7.23	8.93
Michigan	0.39	0.08	0.04		0.05	0.43	0.04
Wisconsin	0.03	0.02	0.00		0.00	0.04	0.00
Iowa	0.02	0.03	0.00		0.00	0.03	0.00
Minnesota	0.01	0.01	0.00		0.00	0.00	0.00
NorthDakota	0.01	0.01	0.00		0.00	0.01	0.00
Missouri	0.13	0.05	0.00		0.00	0.23	0.00
CENRAP_WRA	0.06	0.04	0.00		0.01	0.02	0.00
CENRAP_WRA	0.10	0.08	0.03		0.04	0.15	0.02
Alabama	13.93	0.61	1.36		0.25	0.04	0.01
Mississippi	0.04	0.01	0.00		0.00	0.01	0.00
Georgia	3.64	13.89	9.37		4.37	0.02	0.06
Florida	0.01	0.06	0.01		0.01	0.01	0.01
SouthCarolina	0.37	0.82	0.72		0.18	0.03	0.04
NorthCarolina	1.57	2.94	3.85		1.24	0.10	0.18
Tennessee	2.17	1.19	2.39		3.26	0.20	0.08
Kentucky	1.45	0.64	1.28		2.03	1.90	2.30
Virginia	0.73	0.94	1.65		1.60	0.65	0.72
WestVirginia	1.47	1.00	2.13		3.95	9.31	5.46
Maryland_DC	0.22	0.40	0.53		0.30	0.17	0.26
Delaware	0.11	0.15	0.23		0.11	0.05	0.08
Pennsylvania	1.99	2.12	3.13		4.95	5.30	10.42
NewJersey	0.07	0.12	0.14		0.09	0.07	0.17
NewYork	0.26	0.40	0.42		0.56	0.56	1.49
Connecticut_RI	0.02	0.04	0.03		0.03	0.02	0.07
Massachusetts	0.02	0.06	0.04		0.03	0.02	0.13
Vermont	0.01	0.01	0.01		0.01	0.01	0.05
NewHampshire	0.01	0.04	0.02		0.02	0.02	0.10
Maine	0.01	0.01	0.01		0.01	0.01	0.04
Canada	0.31	0.10	0.16		0.29	0.25	0.59
ICBC	0.31	0.18	0.13		0.17	0.20	0.30
ASOA	0.75	1.13	0.54		0.45	1.08	0.32
BSOA	1.88	2.71	1.21		1.14	2.80	0.89
PM25	36.44	32.28	33.11		31.57	32.89	33.00

2005 DAILY	Louisville	go-Gary-Lake C	Gary	St. Louis	Muscatine	Indianapolis	Detroit-Ann Arbo
	KY-IN	IL-IN	IN	MO-IL	IA	IN	MI
	180190006	170310052	180890022	171191007	191390015	180970081	261630033
Illinois	1.18	17.87	8.38	12.98	8.14	2.07	2.01
Indiana	4.26	5.12	10.78	1.72	1.53	11.17	2.52
Ohio	6.27	2.30	2.25	2.10	1.43	6.87	7.19
Michigan	0.72	2.84	3.68	1.17	2.70	2.80	13.50
Wisconsin	1.08	1.37	0.84	0.72	6.09	0.28	0.68
Iowa	0.39	0.89	1.05	0.97	8.92	0.19	0.43
Minnesota	0.33	0.29	0.28	0.92	3.20	0.10	0.24
NorthDakota	0.07	0.10	0.12	0.26	0.32	0.05	0.09
Missouri	0.39	1.29	1.57	8.02	1.18	0.80	0.68
CENRAP_WRA	0.18	0.82	1.12	1.65	1.52	0.36	0.62
CENRAP_WRA	0.32	0.84	0.96	0.60	0.84	0.63	0.78
Alabama	0.14	0.17	0.25	0.01	0.02	0.30	0.30
Mississippi	0.02	0.08	0.09	0.00	0.01	0.08	0.08
Georgia	0.26	0.12	0.20	0.03	0.06	0.26	0.23
Florida	0.00	0.01	0.01	0.00	0.00	0.08	0.03
SouthCarolina	0.03	0.02	0.03	0.01	0.01	0.07	0.04
NorthCarolina	0.22	0.08	0.10	0.05	0.07	0.22	0.13
Tennessee	0.51	0.38	0.51	0.05	0.11	0.52	0.52
Kentucky	7.14	1.03	1.21	0.34	0.26	1.65	1.14
Virginia	0.33	0.12	0.11	0.05	0.07	0.25	0.17
WestVirginia	1.93	0.55	0.47	0.40	0.37	1.16	0.65
Maryland_DC	0.08	0.04	0.03	0.01	0.01	0.07	0.09
Delaware	0.03	0.02	0.01	0.00	0.00	0.02	0.05
Pennsylvania	3.70	0.84	0.72	0.85	0.57	2.57	1.49
NewJersey	0.04	0.01	0.01	0.00	0.00	0.02	0.04
NewYork	0.61	0.20	0.23	0.23	0.13	0.75	0.78
Connecticut_RI	0.02	0.00	0.00	0.00	0.00	0.01	0.01
Massachusetts	0.02	0.01	0.01	0.00	0.00	0.01	0.02
Vermont	0.01	0.00	0.00	0.00	0.00	0.01	0.00
NewHampshire	0.02	0.00	0.00	0.00	0.00	0.01	0.01
Maine	0.01	0.00	0.00	0.00	0.00	0.01	0.01
Canada	0.68	0.65	0.85	0.70	0.66	1.82	2.58
ICBC	0.60	1.02	0.87	1.02	1.05	0.63	0.91
ASOA	0.29	0.13	0.09	0.11	0.06	0.11	0.10
BSOA	1.01	0.30	0.22	0.25	0.04	0.32	0.16
PM25	32.91	39.50	37.06	35.22	39.35	36.27	38.28

2005 DAILY	Canton-Masillorincinnati-Hamiltveland-Akron-Lcubenville-Weirt				Milwaukee	Green Bay	Lancaster
	OH	OH-KY-IN	OH	OH-WV	WI	WI	PA
	391510017	390618001	390350038	540090005	550790026	550090005	420710007
Illinois	0.48	1.36	0.66	0.27	5.95	4.79	0.29
Indiana	1.06	3.56	1.07	0.59	1.66	1.02	0.46
Ohio	17.16	15.02	19.71	6.05	1.15	0.71	1.44
Michigan	1.91	1.94	2.63	0.97	2.18	1.72	0.38
Wisconsin	0.15	0.33	0.37	0.16	24.00	21.86	0.13
Iowa	0.08	0.28	0.11	0.07	1.24	2.21	0.09
Minnesota	0.12	0.24	0.16	0.07	1.28	1.59	0.08
NorthDakota	0.05	0.09	0.05	0.03	0.29	0.28	0.05
Missouri	0.22	0.31	0.25	0.13	1.04	1.51	0.16
CENRAP_WRA	0.13	0.23	0.12	0.11	0.98	1.86	0.14
CENRAP_WRA	0.35	0.23	0.36	0.06	0.75	0.91	0.21
Alabama	0.22	0.31	0.26	0.02	0.06	0.05	0.13
Mississippi	0.07	0.06	0.06	0.00	0.03	0.01	0.03
Georgia	0.12	0.15	0.27	0.03	0.05	0.05	0.29
Florida	0.10	0.10	0.06	0.00	0.00	0.00	0.04
SouthCarolina	0.02	0.04	0.04	0.01	0.01	0.01	0.21
NorthCarolina	0.10	0.23	0.17	0.05	0.03	0.03	0.73
Tennessee	0.27	0.44	0.34	0.08	0.18	0.14	0.20
Kentucky	1.06	2.62	0.83	5.27	0.50	0.41	0.37
Virginia	0.45	0.24	0.26	0.48	0.04	0.03	2.05
WestVirginia	1.48	1.04	0.95	4.60	0.27	0.17	0.89
Maryland_DC	0.44	0.07	0.15	0.54	0.02	0.00	4.62
Delaware	0.05	0.02	0.04	0.07	0.01	0.00	0.84
Pennsylvania	7.28	2.08	3.42	11.33	0.49	0.27	19.26
NewJersey	0.15	0.02	0.06	0.18	0.01	0.00	1.38
NewYork	1.17	0.50	1.13	1.00	0.11	0.10	1.83
Connecticut_RI	0.05	0.00	0.02	0.06	0.00	0.00	0.36
Massachusetts	0.08	0.01	0.03	0.09	0.00	0.00	0.49
Vermont	0.02	0.00	0.01	0.02	0.00	0.00	0.05
NewHampshire	0.03	0.01	0.01	0.04	0.00	0.00	0.18
Maine	0.03	0.00	0.01	0.03	0.00	0.00	0.12
Canada	1.79	1.31	2.76	1.10	0.54	0.56	0.49
ICBC	0.69	0.59	0.79	0.71	1.14	1.01	0.87
ASOA	0.15	0.15	0.18	0.19	0.11	0.08	0.25
BSOA	0.36	0.47	0.51	0.47	0.19	0.06	0.58
PM25	37.90	34.03	37.84	34.91	44.31	41.44	39.68

2005 DAILY	Liberty-Clairton	burgh-Beaver V	York	Baltimore	N.New Jersey-L	New York City	New Haven
	PA	PA	PA	MD	NY-NJ-CT	NY	CT
	420030064	420070014	421330008	245100040	340390004	360610056	90090018
Illinois	0.30	0.46	0.26	0.33	0.42	0.38	0.17
Indiana	0.74	1.17	0.44	0.53	0.63	0.55	0.30
Ohio	7.07	7.53	1.21	1.25	1.31	1.26	0.75
Michigan	0.87	0.98	0.29	0.36	0.47	0.57	0.26
Wisconsin	0.07	0.12	0.10	0.14	0.18	0.20	0.08
Iowa	0.07	0.06	0.07	0.10	0.15	0.13	0.07
Minnesota	0.05	0.07	0.06	0.09	0.14	0.13	0.04
NorthDakota	0.05	0.04	0.04	0.06	0.08	0.07	0.02
Missouri	0.19	0.23	0.16	0.21	0.24	0.18	0.17
CENRAP_WRA	0.15	0.11	0.14	0.20	0.25	0.20	0.19
CENRAP_WRA	0.09	0.41	0.25	0.25	0.37	0.31	0.34
Alabama	0.04	0.24	0.17	0.14	0.14	0.12	0.08
Mississippi	0.01	0.09	0.03	0.03	0.04	0.03	0.02
Georgia	0.05	0.14	0.34	0.32	0.30	0.23	0.10
Florida	0.00	0.08	0.04	0.03	0.03	0.03	0.01
SouthCarolina	0.01	0.02	0.22	0.25	0.26	0.22	0.05
NorthCarolina	0.07	0.09	0.78	0.94	0.78	0.65	0.38
Tennessee	0.12	0.31	0.25	0.22	0.27	0.20	0.20
Kentucky	1.59	1.77	0.39	0.46	0.47	0.36	0.32
Virginia	0.57	0.47	2.24	2.58	1.34	1.06	0.85
WestVirginia	2.85	2.28	0.86	0.76	0.61	0.54	0.53
Maryland_DC	0.66	0.56	4.12	14.78	1.21	0.88	0.65
Delaware	0.15	0.06	0.87	0.82	0.62	0.48	0.29
Pennsylvania	13.84	14.78	18.89	8.26	5.43	3.76	2.74
NewJersey	0.28	0.23	1.31	1.48	15.82	5.29	1.94
NewYork	0.83	0.86	1.67	2.22	5.38	18.43	5.22
Connecticut_RI	0.09	0.08	0.32	0.45	0.89	0.99	10.85
Massachusetts	0.12	0.11	0.46	0.62	0.98	0.82	3.45
Vermont	0.02	0.02	0.05	0.09	0.14	0.10	0.53
NewHampshire	0.03	0.04	0.15	0.21	0.33	0.25	1.20
Maine	0.02	0.03	0.11	0.16	0.23	0.16	0.60
Canada	0.91	0.87	0.48	0.69	0.60	0.58	1.36
ICBC	0.77	0.77	0.93	1.00	1.23	1.14	1.38
ASOA	0.32	0.17	0.22	0.19	0.22	0.22	0.29
BSOA	0.91	0.39	0.45	0.26	0.24	0.32	0.36
PM25	33.90	35.61	38.41	40.47	41.82	40.84	35.80

September 2, 2009

The Honorable Lisa P. Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code 1101A
Washington, DC 20460

Dear Administrator Jackson:

On behalf of 17 states in the eastern half of the U.S., we wish to provide the following recommendations to the Environmental Protection Agency (EPA) to consider as it develops a replacement rule for the Clean Air Interstate Rule (CAIR), in light of the December 23, 2008, remand by the U.S. Court of Appeals for the D.C. Circuit.

The recommendations follow through on the commitment we made in the March 9, 2009, Framework Document to work together to address the transport requirements of Section 110(a)(2)(D) of the Clean Air Act (CAA), and to attain the ozone and PM2.5 National Ambient Air Quality Standards (NAAQS). Please understand that in preparing these recommendations our fundamental air quality objective is to achieve attainment and ensure maintenance of the NAAQS as expeditiously as practicable.

As the result of our collaboration, we recommend for your consideration a framework, which is based on in-depth technical evaluations and a sincere and concerted effort by all states to reach common ground on an overall approach to addressing transport. This comprehensive framework comprises national rules involving significantly contributing states that combine statewide emissions caps and complementary regional trading programs with a state-led planning process to address transport in a multi-pronged and layered approach. While the undersigned states have reached consensus on this suggested framework, there are some regional differences concerning the timing and stringency of electric generating unit (EGU) reductions, and the criteria for determining which states are included in the state-led planning process. In addition, the states differ in their perspectives on whether performance based standards should be part of the strategy.

The Lake Michigan Air Directors Consortium (LADCO) and the Ozone Transport Commission (OTC) will be submitting separate letters to explain their perspectives on these areas of regional differences on implementation of the framework.

Many areas in the eastern U.S. are designated as nonattainment for the current ozone and PM2.5 standards (1997 version), and it is expected that even more areas will not be in compliance with 2008 ozone and 2006 PM2.5 standards. Numerous data analysis and modeling studies have shown that some (not all) of these nonattainment problems are strongly influenced by inter-state transport.

Additional regional emission reductions will be necessary to help states meet the new air quality standards. A timely and robust federal program that requires substantial regional emission reductions from mobile sources, area sources and large point sources such as

EGUs is an essential component of any strategy to reduce interstate transport of air pollution. These reductions are necessary to attain and maintain compliance with the NAAQS.

The undersigned states recommend a 3-step approach, as further discussed below, to establish a framework from which to address the requirements of CAA section 110(a)(2)(D):

1. Identifying areas of interest (i.e., those not meeting the standards and those struggling to maintain the standards);
2. Identifying, based on specific criteria, upwind states which contribute to nonattainment or interfere with maintenance in these areas of interest; and
3. Implementing a multi-sector remedy to meet CAA requirements.

Step 1 - Identifying Areas of Interest

A. While the requirements of Section 110(a)(2)(D) apply to all areas, most attention should be given to those areas not meeting or struggling to maintain the NAAQS. These "areas of interest" should be identified using monitoring and modeling data.

B. Specifically, areas with both base monitored design values and future modeled design values above the applicable NAAQS should be designated as areas of interest. The monitored design values are based on the maximum design value from the periods 2003-2005 through the most recent three-year period, and the future modeled values are based on future year modeling which reflects legally enforceable control measures and a conservative model attainment test - i.e., use of maximum design values rather than average design values.

    1. The use of maximum design values and a conservative model attainment test are intended to account for historic variability, which is necessary to ensure maintenance. An alternative means of accounting for historic variability is to conduct a statistical analysis of the year-to-year variation in meteorology.

    2. Requiring a more conservative model attainment test will necessitate a change in EPA's modeling guidance. EPA should also establish performance criteria to insure that the modeling is capturing transport appropriately.

    3. EPA's approach in CAIR also reflects a "monitored and modeled" test to identify areas of interest.

Step 2 - Identifying Upwind States that Significantly Contribute to Nonattainment or Interfere with Maintenance

A. An upwind state significantly contributes to nonattainment or interferes with maintenance in a downwind area of interest if its total impact from all source sectors equals or exceeds 1% of the applicable NAAQS.

B. Individual state contributions should be determined through a weight-of-evidence approach, including source apportionment modeling.

C. Use of 1% of the NAAQS as the significance threshold is consistent with EPA's approach in CAIR.

Step 3 - Implementing a Multi-Sector Remedy to Meet Clean Air Act Requirements

A two-part process is recommended consisting of: (A) a national/regional control program adopted by EPA for EGUs and additional federal control measures for other sectors, and (B) state-led efforts to develop, adopt, and implement federally enforceable plans for each area of interest that is not expected to attain the standards even after implementation of the national/regional program.

A. National/Regional Control Program

A significantly contributing state (i.e., a state which contributes at least 1% to a downwind area of interest) must comply with the national/regional control program described below.

1. EGU point source strategy (applicable to units ≥ 25 MW)
   In adopting a CAIR replacement rule EPA should:

   (a) make federally enforceable through appropriate mechanisms all nitrogen oxide (NOx) and sulfur dioxide (SO_2) controls to comply with the original CAIR Phase I program;

   (b) make federally enforceable through appropriate mechanisms optimization by no later than early 2014 of existing NOx and SO_2 controls;

   (c) make federally enforceable through appropriate mechanisms application by 2015 of low capital cost NOx controls;

   (d) establish statewide emission caps by no later than 2017 for all fossil fuel-fired units ≥25MW. The caps should reflect an analysis of NOx and SO_2 controls on coal-fired units ≥ 100 MW which, in combination with the three measures above, will achieve rates that are not expected to exceed 0.25 lb/MMBTU for SO_2 (annual average for all units ≥25 MW) and 0.11 lb/MMBTU for NOx (ozone seasonal and annual average for all units ≥25 MW) and which will result in lower rates in some states. Previously banked emissions under the Title IV or CAIR programs shall not be used to comply with the state-wide emission caps; and

   (e) to the fullest extent allowed under the Clean Air Act, EPA should work with the states to establish regional emissions caps with full emissions trading to replace the caps currently applicable under CAIR.

Again, there are regional differences on some elements of the EGU point source strategy, including mechanisms for achieving reductions prior to 2017. Further recommendations will be provided in separate letters by LADCO and OTC.

2. Non-EGU point source strategy

    a. EPA should identify and prioritize other categories of point sources with major emissions of NOx and/or SO_2 (e.g., cement plants) based on a review of available emissions inventories and other information, such as source apportionment studies.

    b. For the non-EGU point sources, EPA should identify and evaluate control options for reducing NOx and/or SO_2 emissions. The evaluation should consider the technological, engineering, and economic feasibility of each control option.

    c. At a minimum, EPA should evaluate the technological, engineering, and implementation feasibility, and cost-effectiveness of controlling SO_2 and NOx emissions from industrial, commercial, and institutional boilers $\geq$ 100 MMBTU/hour.

3. Mobile source strategy, such as new engine standards for on-highway and off-highway vehicles and equipment, and a single consistent environmentally-sensitive formulated fuel.

4. Area source strategy, such as new federal standards for consumer products and architectural, industrial and maintenance coatings as originally promised by EPA in 2007

B. State- Led Attainment Planning

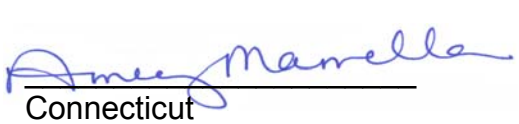
The undersigned states recommend the use of a state-led attainment planning process concurrent with developing the transport SIP to address areas of interest that are not expected to attain after implementation of the national/regional control program. The state-led planning effort should involve a key subset of significantly contributing states to develop, adopt, and implement an appropriate attainment strategy. EPA should work with the states to establish criteria for determining which significantly contributing states should be involved in the state-led planning process. Additionally EPA should work with the states to determine the appropriate criteria for each state to satisfy CAA section 110(a)(2)(D). The advantages of this state-led planning effort include:

- A one-size-fits-all federal solution cannot provide the most appropriate and cost-effective solution for each area;
- Attainment planning is more effective and more likely to succeed if it is done on a non-attainment area basis with a key subset of contributing states;
- Additional controls are identified where they are needed; and
- States maintain their responsibility under the Clean Air Act to establish state implementation plans.

Further recommendations on this issue will be provided in separate letters by LADCO and OTC.

The comprehensive framework outlined above represents the culmination of our collaborative work over the past six months. We look forward to working with you further as EPA develops its CAIR replacement rule.

Sincerely,



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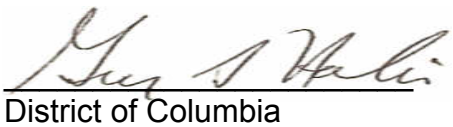

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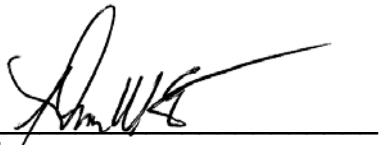

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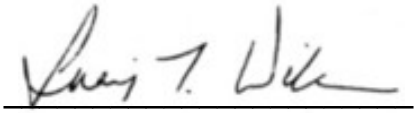

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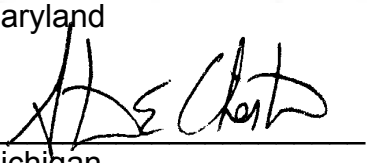

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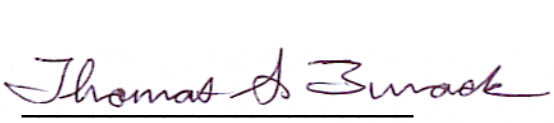

New Hampshire

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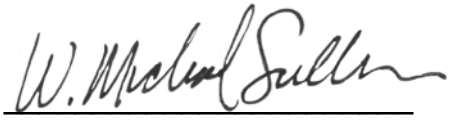

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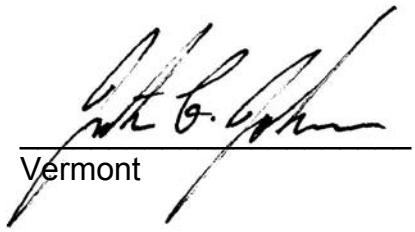

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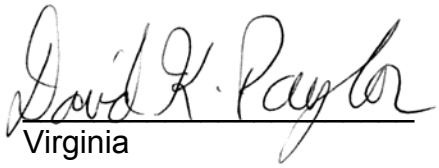

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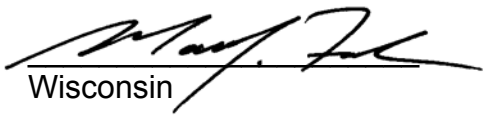

Wisconsin

OZONE
TRANSPORT
COMMISSION

Connecticut

Delaware

District of Columbia

Maine

Maryland

Massachusetts

New Hampshire

New Jersey

New York

Pennsylvania

Rhode Island

Vermont

Virginia

Anna Garcia
Executive Director

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Washington, DC 20001
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FAX (202) 508-3841
e-mail: ozone@otcair.org

September 10, 2009

The Honorable Lisa P. Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code 1101A
Washington, DC 20460

Dear Administrator Jackson:

On September 2, 2009, 17 states within the Ozone Transport Commission (OTC) and the Lake Michigan Area Directors Consortium (LADCO) submitted a letter to you containing recommendations for the Environmental Protection Agency (EPA) to consider as it develops a replacement rule for the Clean Air Interstate Rule (CAIR replacement). The OTC and LADCO States reached consensus on many critical issues, including the creation of a three-step framework to address the requirement of section 110(a)(2)(D) of the Clean Air Act (CAA). Building on the OTC and LADCO consensus, this letter provides EPA with additional recommendations related to several aspects of the joint OTC-LADCO letter of September 2nd based on OTC's 15 years of experience addressing the scientific phenomenon of air pollutant transport and its impact on public health.

Achieving the ozone and $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) is a challenge and widespread regional reductions are a very important piece in the solution to this puzzle. The U.S. Court of Appeals for the District of Columbia Circuit found that CAIR failed in at least two important ways: (1) it did not ensure sufficient reductions from each state; and (2) the schedule did not mesh with the attainment deadlines. The additional recommendations OTC is providing are intended to address both issues. By combining regional and state caps, electricity generating unit (EGU) emission reductions will be achieved cost-effectively throughout the region while ensuring that each State's emissions are reduced significantly. To the extent possible, given labor and supply constraints, emissions reductions need to occur three years prior to the attainment deadlines in order to provide the maximum benefit in a timely manner.

OTC recognizes that the attainment deadlines for the 75 ppb ozone NAAQS, or a more stringent ozone NAAQS, will be a function of the yet to be adopted nonattainment classification levels. OTC further suggests that EPA's rules also address a longer time period, including between 2017 and about 2025, to address longer-term air quality improvement needs and the very substantial emission reductions necessary to attain and maintain the air quality standards.

OTC appreciates the efforts put forth by EPA to work with all interested stakeholders in developing a CAIR replacement rule based on sound science. OTC further acknowledges that air pollutant transport within the OTC region is a significant issue that EPA should also address. The CAIR replacement rule should also recognize that our planning processes continue to evolve in the face of ever-tightening standards and newly uncovered air quality concerns, such as the impact of peaking unit emissions on high electricity demand days (HEDD). As such, OTC recommends that EPA propose measures to address HEDD emissions in the CAIR replacement rule.

Our recommendations are provided below in three parts. OTC considers these recommendations feasible, practicable and operable within the framework of the existing Clean Air Act, all of which facilitate a rapid adoption process as directed by the D.C. Circuit Court of Appeals in remanding CAIR. The CAIR replacement rule offers an opportunity for transformational change over incremental improvement. Providing regulatory certainty to America's electric generating sector promotes transformational change through business decisions that support our air quality goals. A summary of the technical analyses conducted by the OTC States and provided as support documentation for the recommendations provided in this letter and the September 2, 2009 letter is attached to support these recommendations.

A. Achievable EGU Limitations

The OTC States recommend that EPA consider a comprehensive, multi-layered, hybrid approach for obtaining further reductions from EGUs. This hybrid approach combines state and regional caps with phased-in performance standards to cost-effectively reduce nitrogen oxide (NOx) and sulfur dioxide (SO_2) emissions. The components of this strategy (enforceable conditions, state-by-state reductions, regional trading caps/program and phased performance standards), should coordinate with each other and other EGU control initiatives such as federal MACT standards and greenhouse gas reduction programs.

A national strategy for EGUs should be implemented in phases. The first phase should combine federally enforceable NOx and SO_2 reductions from each state with a regional trading program. A later phase should include performance standards to achieve continuing reductions from the EGU sector over the course of the regulatory time frame for implementation of the 2008 ozone and 2006 $PM_{2.5}$ NAAQS.

Timing is essential to meet attainment obligations. Three years of data are needed to demonstrate attainment; therefore reductions are needed three years prior to the attainment deadline. While we recognize that full implementation of all controls may not be achieved in that time frame, it is essential that enforceable mechanisms be provided to lock in controls that are achievable. The OTC-LADCO submission reflects the participating states' agreement on state-specific caps that would be applicable no later than 2017. Years prior to 2017 may be critical for many states to demonstrate attainment with the applicable NAAQS. The OTC States seek to work with EPA to develop mechanisms for achieving interim reductions in the 2012-16 time period, including the possibility of interim state-specific caps in addition to a regional cap-and-trade program.

Since CAIR was not sufficient for attaining and maintaining the 1997 ozone NAAQS, EPA will need to make the limits in the CAIR replacement rule stricter to enable compliance with the recently revised ozone and PM NAAQS and any tighter standards that EPA enacts after reconsideration of those standards. The state caps are also necessary to ensure that each State contributes fully to the needed reductions.

Specifically, the OTC States propose that EPA include phased state-by-state reductions, complementary regional emission trading caps as early as possible (but no later than 2014), and performance standards as follows:

1. State-by-State Reductions

The September 2, 2009 letter recommends the implementation of state caps by no later than 2017 that reflect the emission rates that would be achieved through installation of SCR and FGD controls on all coal-fired EGUs of 100 MW or larger in all significantly contributing states. In addition, the participating states recommend in that letter a number of interim measures including operation and optimization of all controls currently in place or being installed to meet other requirements, and installation and operation of all feasible, low capital cost NOx controls such as selective non-catalytic reduction (SNCR) and low NOx burners (LNB) not currently installed or in use on existing EGUs on a unit basis by 2015.

The OTC States recommend that EPA analyze and determine the state-by-state reductions needed prior to 2017 in order to address CAA Section 110(a)(2)(D) requirements to address interstate transport from EGUs within the NAAQS timeframe. The OTC States see interim state-by-state reductions prior to 2017 as a key part of addressing the Court of Appeals concerns over what is needed to satisfy the requirements of CAA Section 110(a)(2)(D).

2. Regional Trading Programs for NOx and SO_2.

As explained in the September 2, 2009 submission, the second key element of the OTC-LADCO agreed framework for a CAIR replacement rule is the implementation of regional trading programs for both NOx and SO_2, to complement the state-by-state caps described above. The OTC States recommend that EPA consider the following in developing the regional caps:

- The new regional caps should be implemented as early as possible and set at a level that will drive deeper regional NOx and SO_2 reductions than the regional reductions that would result from the implementation of the state-by-state caps by themselves. This pairing of state-by-state caps with an aggressive regional trading program will guarantee specific reductions in each state while also using market forces to further reduce regional emissions at lowest cost.
- OTC's analysis (attached) and the analysis that EPA recently prepared for Senator Carper show that stringent regional trading caps for NOx and SO_2, implemented as early as possible (but no later than 2014), would provide significant public health benefits that substantially outweigh the costs.
- Banking and inter-state trading would continue to be allowed in the regional trading program.

- To be creditable under Section 110(a)(2)(D), controls installed in response to the regional trading program should be made federally enforceable through an appropriate mechanism.

3. Performance Standards

We understand that EPA is also considering a hybrid approach in its CAIR replacement rule involving regional emissions trading and unit-specific performance standards (cite: July 9, 2009, testimony by R. McCarthy before the Subcommittee on Clean Air and Nuclear Safety, Committee on Environment and Public Works, U.S. Senate).

The OTC States request that EPA work with the states to develop and phase in unit-specific performance standards that owners of fossil fuel-fired units should comply with between 2017 and 2025, or earlier if EPA's technical analysis demonstrates that an earlier date is reasonable. Performance standards should either be output-based or transition to output-based standards to reward efficiency. Such performance standards will give regulatory certainty to EGU owners and encourage transformational change in the energy market. In developing these performance standards:

- EPA should consider fuels, types and sizes of EGUs, the timing of other requirements included in this and the September 2, 2009 letter, cost-effectiveness and the pollution control equipment already in place on the existing fleet of EGUs.
- EPA should phase-in the performance standards to maximize efficiency and minimize costs to affected sources. For example:
    - The performance standards for coal-fired units greater than 100 MW should be coordinated with the state-by-state caps that are recommended for no later than 2017.
    - The performance standards for units subject to the upcoming federal MACT requirements should be coordinated with the MACT requirements.
- In later phases (2020 to 2025), the performance standards should be coordinated with greenhouse gas reduction programs and other energy efficiency initiatives and be output-based.
- OTC's analysis (attached) shows that performance standards on larger fossil-fuel fired EGUs (based on a 30-day rolling average) are feasible and should be implemented on an aggressive timeframe (as early as 2017).
- EPA should consider including incentives (e.g., alternative compliance schedules not to exceed three years), to promote the repowering or replacement of existing units.
- After the adoption and implementation of performance standards, EPA should evaluate the feasibility of eliminating the state-by-state caps.

B. State-led Planning Process

The OTC States recommend that the state-led planning effort include all significantly contributing states (i.e., 1% of the NAAQS or greater impact) unless each state in the affected nonattainment area chooses to reduce the number of states involved.

- The OTC believes that this is the most appropriate way to identify those states that are required to participate in the state-led planning process as model performance (related to long-range transport) varies from one nonattainment area to another and the meteorology that affects some nonattainment areas is very complex.
- The states in the nonattainment area would use monitoring data, modeling and other information on ozone transport, meteorology, emissions, control programs, geography and chemistry to decide which significantly contributing states, if any, should be excused from the state-led planning process.
- Two scenarios are outlined below:
    - If the states in a nonattainment area have technical data that show that the state-led planning process for that area should be limited to just three or four states, that would be appropriate.
    - If the states in a nonattainment area are subject to highly complex transport patterns, it is most likely necessary to include all significantly contributing states in the state-led planning process.
- The OTC believes that the most appropriate way to address transport is through a suite of aggressive national programs to reduce NOx, VOC and SO_2 emissions from EGUs, other stationary sources, area sources and off-road and on-road mobile sources and that the role of the state-led planning process should be secondary.
- The OTC continues to have serious concerns over model performance related to long-range, aloft transport. It is critical for EPA to establish and implement performance criteria related to aloft transport to ensure that the process for identifying significantly contributing states is credible.
- As indicated in the September 2, 2009 joint letter, additional controls may be required where needed.

C. Eliminating Significant Contribution

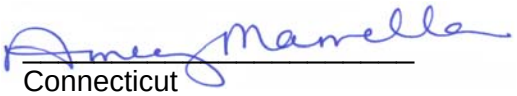
The OTC States recommend that under the state-led attainment planning process, both the upwind states and EPA remain accountable to address contributions to downwind areas' nonattainment of both the ozone and $PM_{2.5}$ NAAQS by the relevant attainment dates, without designing any new "off-ramp" that avoids direct and timely action to reduce emissions that are in violation of CAA Section 110(a)(2)(D).

In addition to a program of controls for EGUs, OTC also urges EPA to address interstate transport through the development and implementation of national rules in

2012 or as early as feasible for additional controls on non-EGU sources, as supported in prior statements of the OTC to EPA. (*See*, *e.g.,* Statement on the Need for National Rulemaking and Implementation of Ozone Control Measures, November 14, 2007).

In acting on these recommendations, EPA can use the CAIR replacement rule to provide regulatory certainty to the EGU sector, which will enable business decisions that will move us many steps toward improved air quality and a more efficient electricity generating sector. We look forward to talking with you further about our recommendations for the CAIR replacement rule, and working with your staff as you expeditiously develop this important air quality and public health program.

Sincerely,



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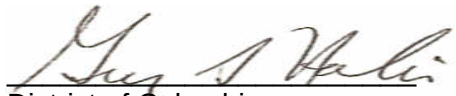

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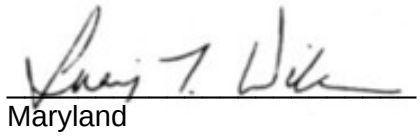

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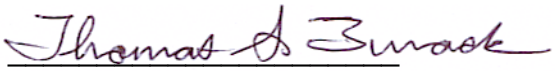

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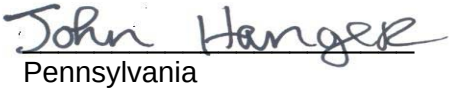

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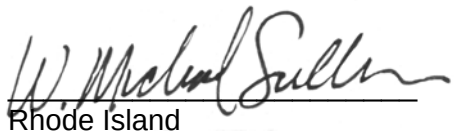


Rhode Island

Vermont

Enclosures

OTC CAIR Replacement Rule Recommendation Technical Support Document

The OTC is providing technical information in support of the recommendations to EPA on a CAIR replacement rule included in the September 2, 2009 joint letter from OTC and LADCO and the additional recommendations in the September 10, 2009 letter from OTC. The supporting materials provided below are organized as follows:

- Assessments and Rationale for Electricity Generating Units (EGUs)
  - EGU Emission Rates
  - Timing
  - Cost of Controls
  - Air Quality Benefits

- Assessments and Rationale for Other Sectors
  - Other Stationary Source Measures
  - Mobile Source Measures

- Appendix I – EGU Rates
- Appendix II – Timing
- Appendix III – Cost of Controls
- Appendix IV – Air Quality Benefits
- Appendix V – Other Sectors

The technical information included in this support document is based on studies and analyses conducted recently by the OTC, and where noted, by LADCO.

Assessments and Rationale for Electricity Generating Units (EGUs)

In its earliest response to EPA's proposed transport rule - first the Interstate Air Quality Rule (IAQR), and later, the Clean Air Interstate Rule (CAIR) - OTC provided comments and analyses showing that additional NOx and SO_2 reductions beyond those the rule provided would be needed for areas in the OTR to come into attainment with the ozone and $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS). In response to the IAQR and CAIR, the OTC states developed a multi-pollutant position in 2004, using several different analyses of potential EGU control rates as a basis for developing national caps for NOx and SO_2 that were more stringent and earlier than those provided in CAIR.

The analysis used in OTC's recent review of the 2004 multi-pollutant position, along with evaluations of the current state of controls on EGUs and rate information extracted from recent American Electric Power Service Corp. (AEP) settlements and consent decrees was provided to the state collaborative process. Additional support for the timeframes and flexibility provisions in the OTC additional recommendations are provided in a short case study on the experiences of the Maryland Department of Environment (MDE) with its Healthy Air Act (HAA), as well as experiences in other states with their own state rules and additional information contained in the AEP settlements/consent decrees. Recent evaluations of control cost data that OTC has conducted for potential control strategies, including analyses for industrial, commercial and institutional boilers and boilers serving EGUs, provide data for relative cost/ton comparison between EGU and other sector NOx and SO_2 controls. An additional sensitivity analysis using OTC's latest SIP modeling runs, in tandem with the results from the State

Collaborative modeling runs, demonstrate the need for the air quality benefits that can be achieved from the rates and structure of the OTC recommendations.

EGU Emission Rates

In developing its 2004 position, OTC relied heavily on an analysis conducted by the National Association of Clean Air Agencies (NACAA) to support of its 2002 Principles for a Multi-Pollutant Strategy for Power Plants. The NACAA analysis demonstrated that reductions in the range of 82-88% by 2013 for SO_2 and 73-81% for NOx from a 2001 baseline were technologically feasible. Reductions within this range would yield emission rates as follows:

- NOx: 0.07 for new source BACT; 0.10 for retrofit BACT; and
- SO_2: 0.10 for new source BACT; 0.15 for retrofit BACT.

In comparison, the average emission rates for 2001 as reported by EPA were 0.37 lb/mmBtu for NOx and 0.84 lb/mmBtu for SO_2 (the 2001 baseline would not have included the NOx SIP Call).

OTC continued to work on and refine its position on EGU rates, based on additional analyses. In a 2007 review, the OTC Multi-P Workgroup performed an analysis to determine revised NOx and SO_2 cap levels.

Assessment 1. In the 2007 review of the OTC multi-pollutant position for EGUs, the OTC Multi-P Workgroup performed an analysis using the EPA Acid Rain database and information from the Department of Energy's Energy Information Agency (EIA) to examine reasonably cost-effective post-combustion EGU control technologies and determine fleet-wide average NOx and SO_2 emission rates for the fossil fuel-fired EGUs in the lower 48 states. The OTC Multi-P Workgroup concluded that for NOx, a 0.08 lbs/mmBtu fleet wide average emission rate would be achievable by 2018, along with an interim hard cap in 2012 based on a 0.125 lbs/mmBtu fleet-wide average. For SO_2 the OTC Multi-P Workgroup concluded that a 0.15 lb/mmBtu fleet wide average emission rate was achievable by 2018, along with an interim hard cap in 2012 based on a 0.25 lb/mmBtu fleet-wide average. The methodology applied by the OTC Multi-P Workgroup included the assumptions in Table I-1 below (also shown in Appendix I):

Table I-1. Control Assumptions for the Methodology Applied by the OTC Multi-P Workgroup

	EGU Size				Emission reduction assumed	
	25MW-<100MW	100MW-<200MW <50% input capacity	100MW-<200MW >50% input capacity	200MW or greater	For EGUs with existing "assumed" add-on controls	For EGUs applying "new" add-on controls
NOx	SNCR	SNCR	SCR	SCR	Remains same as 2008 controlled level	90% SCR 355 SNCR 55% SNCR to SCR increment
SO2	DSI	DSI	FGD	FGD	Remains same as 2008 controlled level	95% FGD 60% DSI

Control Technologies: DSI (Duct Sorbent Injection); FGD (Flue Gas Desulfurization); SCR (Selective Catalytic Reduction); SNCR (Selective Non-Catalytic Reduction)
* For EGUs identified as already incorporating the technology applied in the OTC Multi-P Workgroup's methodology their NOx emission rates were assumed to remain the same as their 2008 Ozone Season controlled

emission rates and their SO_2 emission rates were assumed to remain the same as their annual 2008 controlled emission rates.
**For each NOx and SO_2 control technology a 0.06 lb/MMBTU "basement" level (i.e., maximum control level) was assumed.

When these assumptions are applied to coal units (all coal and coal>100 MW) on a statewide average ozone season basis in the Ozone Transport Region (OTR), the result is a range of rates for NOx between 0.06 and 0.23 lb/mmBtu. A similar application in the LADCO states on a statewide average ozone season basis yields NOx rates in the range of 0.06 and 0.14 lb/mmBtu. Similarly, when the SO_2 assumptions are applied in the OTR on a statewide annual basis, the result is a range of rates for SO_2 between 0.06 and 0.32 lb/mmBtu. Following suit in the LADCO states on a statewide annual basis yields SO_2 rates in the range of 0.06 and 0.31 lb/mmBtu. Statewide rates for each state based on this analysis are outlined in Tables I-2 through I-5 in Appendix I.

This analysis does not include emissions from units in the states that use other fuels, such as natural gas, that would lower the overall statewide average emission rate. It also shows that some states with higher percentages of coal in their overall fuel mix will need flexibility in the regulatory structure and timing to achieve those rates.

Assessment 2. In a second assessment of potential EGU rates, OTC compiled information for each of the states in the eastern U.S. to show the average NOx and SO_2 emission rates from EPA's 2008 Clean Air Market Division (CAMD) database, based on units 25 MW and above for all fuels. Then the incremental NOx and SO_2 rates within the ranges discussed by the State Collaborative were calculated for each state, from 0.07 - 0.125 lb/mmBtu for NOx and from 0.15 - 0.30 lb/mmBtu for SO_2. The tons reduced at each control level increment and the percent reduction from 2008 levels is calculated for each state. The results are shown in Tables I-6 and I-7 in Appendix I, along with Tables I-8 and I-9 showing LADCO's data on achievable average annual emission rates based on their plant-level, unit-level analysis of coal fired units greater than 100 MW, and the timing of projected post-combustion controls installations. Comparing the OTC tables based on the CAMD data with the LADCO table, the 2008 rates are very close, despite the fact that the CAMD data includes all fuels and the LADCO data is for coal units only.

Assessment 3. Using a third data set to assess potential EGU emission rates, the OTC examined the recent consent decree signed by American Electric Service Corp. (AEP) which requires the installation of SCR and FGD controls on EGUs in a number of states including Indiana, Kentucky, Ohio, Virginia and West Virginia. The consent decree requires several of these units to meet a federally-enforceable 30-day rolling average emission rate of 0.100 lb/mmBtu for NOx and a 30-day rolling average emission rate of 0.100 lb/mmBtu for SO_2. Furthermore, repowering requirements as stipulated in the consent decree state that the technology achieve "equivalent environmental performance that at a minimum achieves and maintains a 30-day rolling average emission rate of 0.100lb/mmBtu or a 30-day rolling average removal efficiency of at least 95% for SO_2 and a 30-day rolling average emission rate of 0.070 lb/mmBtu for NOx.

The limits specified in the AEP consent decree provide additional support for the technical feasibility and cost effectiveness of the NOx and SO_2 emission rates "observed by" the State Collaborative EGU Technical Workgroup presented at the State Collaborative meetings held on October 7, 2008 and April 27-28, 2009. AEP would not have signed this consent decree if it was not certain that it could comply with all of its terms. Note that the NOx and SO_2 emission rates in the consent decree are more stringent than the NOx and SO_2 emission rates in the OTC recommendations because they are based on unit

specific, 30-day rolling average emission rates rather than statewide average emission rates. If EGU retrofits can achieve the NOx and SO_2 rates specified in the AEP consent decree on a unit specific basis, then it should be feasible for other EGUs to achieve these emission rates on a statewide average basis.

Timing

Timing flexibility is a key issue in developing an EGU control strategy. If the regulatory structure is designed correctly, it will provide incentives to get controls installed quickly. One example of this is provided by the Maryland Department of Environment's (MDE) experience with their Healthy Air Act (HAA), which was passed in 2006, with final rules issued in January 2007 (see MDE case study in Appendix II). MDE's experience with the HAA demonstrates that it is possible to achieve simultaneous, rather than sequential, installation of controls in less than 3 years after promulgation of the rules requiring those controls.

- In Maryland, 3 SCRs and 6 SNCRs on coal units ranging in size from 125 - 600 MW, and 6 FGD on 9 coal-fired units ranging in size from 200 -700 MW are installed or will have completed installation by the end of 2009, or less than 3 years after the HAA rules were promulgated. Four SCRs had been installed on coal-fired power plants in Maryland prior to the HAA.
- MDE included a waiver for units that could not meet the control levels by the date required, providing additional time for them to install controls. The waiver was not utilized by any EGU.
- The installations responding to the HAA rules occurred at the same time that controls were being required for CAIR and a number of consent decrees on EGUs. Despite these competing interests, there were no delays in construction or installation due to labor or equipment constraints.

More specific information can be found in Appendix II, Example 1 on the MDE HAA case study, including a schematic of the timeline of installations on specific EGUs in response to the rule.

In another example from Delaware, the state established phased NOx and SO_2 limits in Regulation 1146, promulgated in December 2006, with the first phase of controls required to be operational in May 2009. This provided a 2.5-year window from promulgation of the rule to installation and operation of controls for the first phase of NOx and SO_2 controls. The emission rates and timing for the reductions required by Delaware's Regulation 1146 is applicable to coal-fired and residual oil-fired units 25 MW and above are as follows:

- NOx = 0.15 lb/mmBtu on all units beginning May 1, 2009 through December 2011, with a second, more stringent limit on the same units of 0.125 lb/mmBtu for the period January 1, 2012 and beyond (limits are on a rolling 24-hour basis);
- SO_2 = 0.37 lb/mmBtu on all units beginning May 1, 2009 through December 2011, with a second, more stringent limit on coal-fired units of 0.26 lb/mmBtu for the period January 1, 2012 and beyond (limits are on a rolling 24-hour basis); and
- Residual oil-fired units may not accept residual fuel oil for combustion that has a sulfur content in excess of 0.5% by weight from January 1, 2009 and beyond.

More information on Delaware's Regulation 1146 can be found at:
http://regulations.delaware.gov/AdminCode/title7/1000/1100/1146.shtml

Finally, data collected on controls resulting from EPA's NOx SIP Call show that a over 75 percent of the SCR units installed occurred within a 4-year window, between 2003 to 2007, with more than 50 percent of the installations occurring in the 2003-2004 timeframe. More information on the installation of SCR controls in response to EPA's NOx SIP Call can be found in Appendix II, Example 2.

Cost of Controls

EPA needs to perform a comprehensive cost analysis for the CAIR replacement rule; however, in the interim the data show that aggressive controls on EGUs continues to be the most cost-effective option available to the states in meeting the ozone and $PM_{2.5}$ standards.

Table III-1 in Appendix III provides recently developed cost estimates for various NOx and SO_2 controls in 2008 dollars, including selective non-catalytic reduction (SCR), selective catalytic reduction (SCR), flue gas desulfurization, low NOx burners (LNB)and combinations of these controls on coal-fired, residual oil-fired, distillate oil-fired and natural gas-fired boilers. The data shows that the cost for controls caps out at $4,900 per ton of NOx removed for an SCR and $3,600 per ton of SO_2 removed for a dry FGD system (dry scrubber) installed on a 250 mmBtu/hr (approximately 73 MW) coal-fired boiler operating at 66 percent capacity. The NOx control costs for 250 mmBtu/hr fossil fuel-fired boilers serving EGUs range from $1,100 to $8,700 per ton of NOx removed and the SO_2 control costs for 250 mmBtu/hr coal-fired boilers serving EGUs range from $1,400 to $3,600 per ton of SO_2 removed.

OTC is conducting an extensive examination of potential control measures to consider as additional strategies in their ozone and $PM_{2.5}$ SIPs. The costs of several of these controls on a $/ton basis far exceed the cost of EGU controls, as shown in Tables III-2 and III-3 in Appendix III.

Air Quality Benefits

The State Collaborative effort has produced modeling analyses to examine the impact that a CAIR replacement rule might have on air quality in the Eastern United States. These regional modeling results show that an EGU based strategy would have a positive impact on $PM_{2.5}$ and ozone air quality in the region and that while nearby sources have by far the greatest impact, significant contribution to levels of ozone and $PM_{2.5}$ can come from states several hundred miles away. This effort also shows that with an EGU strategy that approximates CAIR and other currently adopted measures many areas are still above the current ozone (0.075 ppm) and $PM_{2.5}$ NAAQS.

Furthermore, the State Collaborative modeling also show that even with the most stringent NOx (0.07 lb/mmBtu) and SO_2 (0.10 lb/mmBtu) emission control rates applied on a unit-by-unit basis, a number of areas remain in non-attainment . Under these emission limits the modeling shows 23 counties in non-attainment for the 75 ppb ozone standard, 10 counties not meeting the $PM_{2.5}$ daily standard, and 3 counties in non-attainment for the $PM_{2.5}$ annual standard. The State Collaborative modeling is not "SIP quality," so it was conducted to provide, at best, ballpark estimates that are only meant to be directionally correct. Even with the substantial improvement in air quality shown in the 2018 modeling results, however, approximately 37 million people will still be exposed to unhealthy levels of air pollution. Results from the State Collaborative air quality modeling are summarized in the charts and maps on pages 1-2 of Appendix IV.

To ascertain the level of reductions that might be necessary to meet the current ozone NAAQS, the OTC performed sensitivity modeling. This sensitivity modeling employed across-the-board reduction in NOx

emissions (point, area and mobile sources). This sensitivity modeling indicates that by reducing NOx emissions by 40 % from all sectors attainment with the current ozone NAAQS is possible. While it is likely impossible to reduce NOx emissions by 40 % from all sectors, this provides a pathway to determine the level of emissions reductions needed for planning purposes. The ultimate decision on the measures chosen will be based on feasibility (both technical and cost) and effectiveness. Results from the OTC sensitivity modeling are summarized in the maps and charts on pages 3-5 of Appendix IV.

Assessments and Rationale for Other Sectors

The states in the eastern U.S. have affirmed that emission reductions beyond what is achievable from EGU sources alone will be necessary to comply with the ozone and $PM_{2.5}$ standards, and to address transport and regional haze. Both the joint OTC-LADCO recommendation of September 2, 2009 and the additional recommendations provided by OTC in the September 20, 2009 letter put forward potential EGU emission rates for consideration by EPA that go beyond the original CAIR levels. It is important that significant reductions are also obtained from sources in the area and mobile source sectors to bring areas into attainment with air quality standards and mitigate transport of air pollutants and their precursors from one part of the country into another.

Other Stationary and Area Source Measures

The OTC states have taken actions beyond the EGU sector during the past 10 years to reduce NOx and VOC emissions from non-EGU stationary and area sources including consumer products, architectural and industrial maintenance coatings, adhesives and sealants, solvents, portable fuel containers, asphalt paving, distributed generators, cement kilns, glass furnaces and industrial, commercial and institutional (ICI) boilers. The model rules developed in 2001 and 2006 for these source categories have been developed and implemented by many of the OTC states as outlined in Tables V-1 through V-4 in Appendix V.

The OTC has long advocated to EPA that these rules be applied nationally, and EPA has taken national action in some areas, e.g., consumer products. The ICI boiler model rule was used in last year's State Collaborative discussions with LADCO to help develop a joint set of recommendations for a national ICI boiler strategy to EPA. Further, in the current planning work occurring in the OTR for the new ozone and $PM_{2.5}$ SIPs, the OTC is continuing to drill down into other non-EGU stationary and area source categories to find additional reductions, as outlined in the potential measures illustrated in Tables III-2 and III-3 in Appendix III.

Mobile Source Control Measures

The OTC states have also implemented numerous programs to reduce ozone precursor emissions from mobile sources. The majority of the states have adopted California Low Emission Vehicle standards applicable to new vehicles, which are more stringent than federal standards. To address emissions from in-use vehicles, the states have implemented Inspection and Maintenance Programs and aggressive diesel retrofit programs.

States have also exercised their option to opt-in to federal reformulated gasoline as part of their State Implementation Plans (SIPs). To counter growth in vehicle miles traveled, states in the region have included transportation control measure in their SIPs (e.g., improved public transit) and have

implemented many air quality improvement projects through the conformity review process to ensure mobile source emission budgets are met.

The OTC Mobile Source Committee is currently working on additional mobile measures as part of the 2008 ozone standard regional attainment planning process. It is supporting the adoption of national measures in areas where the states are pre-empted from taking action. For example, it has submitted a letter of support for the ocean going vessels Emission Control Areas (ECA) designation to reduce emissions from port areas. And it has encouraged EPA to issue guidance from EPA on its Aftermarket Catalyst Replacement Standards policy. The OTC is also advocating for EPA to address backsliding with regard to the Renewable Fuel Standard (RFS), to ensure that phase 2 of the program does not further exacerbate criteria pollutant impacts that have occurred in Phase 1 of the program.

Other mobile measures that are under review in the OTC and NESCAUM states are:

- Offshore lightering for ships (VOC reductions)
- Seaports strategy (PM strategy primarily)
- Adoption and enforcement of non-road idling requirements (VOC, NOx and GHG reductions)
- Regional fuel for OTC states/areas that have not yet adopted RFG (i.e. large parts of PA and NY))
- Heavy duty diesel strategies such as Inspection and Maintenance Programs for Diesels and expansion of diesel retrofit programs
- Additional VMT-reduction strategies that will result in ozone precursor and GHG reductions

In the context of Greenhouse Gas Emissions, the OTC states have been involved in numerous actions that will result in the overall reduction of ozone precursors as well as GHG emissions. The litigation of Mass v. EPA, joined by many OTC states, and the active support of OTC-member states for the integration of motor vehicle efficiency standards and GHG emission standards into a new federal policy endorsed by President Obama are examples. The RGGI States, with PA, are also working on the development of a low carbon fuel standard (LCFS), including the potential to improve the infrastructure for electric vehicles that may be part of that strategy, and smart growth/VMT and land use measures to reduce mobile emissions.

Appendix I – EGU Rates

Assessment 1

The methodology applied by the OTC Multi-P Workgroup and used for this assessment is included the assumptions in Table 1-1 below:

Table I-1. Control Assumptions for the Methodology Applied by the OTC Multi-P Workgroup

	EGU Size				Emission reduction assumed	
	25MW-<100MW	100MW-<200MW <50% input capacity	100MW-<200MW >50% input capacity	200MW or greater	For EGUs with existing "assumed" add-on controls	For EGUs applying "new" add-on controls
NOx	SNCR	SNCR	SCR	SCR	Remains same as 2008 controlled level	90% SCR 355 SNCR 55% SNCR to SCR increment
SO2	DSI	DSI	FGD	FGD	Remains same as 2008 controlled level	95% FGD 60% DSI

Control Technologies: DSI (Duct Sorbent Injection); FGD (Flue Gas Desulfurization); SCR (Selective Catalytic Reduction); SNCR (Selective Non-Catalytic Reduction)

* For EGUs identified as already incorporating the technology applied in the OTC Multi-P Workgroup's methodology their NOx emission rates were assumed to remain the same as their 2008 Ozone Season controlled emission rates and their SO_2 emission rates were assumed to remain the same as their annual 2008 controlled emission rates.

**For each NOx and SO_2 control technology a 0.06 lb/MMBTU "basement" level (i.e., maximum control level) was assumed.

Based on the above assumptions, the "predicted" statewide average ozone season NOx emission rates are shown below:

Table I-2. All Coal

State	Predicted NOx Mass	2008 O.S. Heat Input	Predicted Avg NOx Rate	State	Predicted NOx Mass	2008 O.S. Heat Input	Predicted Avg NOx Rate
CT	395	13,163,750	0.0600	IL	13,297	443,240,475	0.0600
DE	1,863	20,145,049	0.1850	IN	12,814	427,135,645	0.0600
MA	1,569	40,324,189	0.0778	MI	12,645	208,348,933	0.1214
MD	5,345	112,279,215	0.0952	OH	19,156	274,909,447	0.1394
NH	1,754	15,347,558	0.2286	WI	34,845	627,665,733	0.1110
NJ	2,438	30,586,717	0.1594				
NY	4,321	76,120,595	0.1135				
PA	25,880	446,215,793	0.1160				
VA	6,070	119,264,709	0.1018				

If only coal-fired units with a nameplate rating of 100MW or greater are to be considered, the "predicted" statewide average ozone season NOx emission rates are shown below:

Table I-3. >100 MW Coal

State	Predicted NOx Mass	2008 O.S. Heat Input	Predicted Avg NOx Rate	State	Predicted NOx Mass	2008 O.S. Heat Input	Predicted Avg NOx Rate
CT	395	13,163,750	0.0600	IL	12,817	417,656,155	0.0614
DE	1,863	20,145,049	0.1850	IN	23,368	492,447,671	0.0949
MA	1,298	35,899,623	0.0723	MI	13,082	278,933,070	0.0938
MD	5,127	110,241,907	0.0930	OH	26,348	519,802,282	0.1014
NH	1,362	11,735,819	0.2321	WI	7,293	185,704,212	0.0785
NJ	2,284	29,350,532	0.1556				
NY	3,828	68,614,070	0.1116				
PA	24,430	430,902,559	0.1134				
VA	4,918	107,929,830	0.0911				

Based on the above assumptions, the "predicted" statewide average annual SO2 emission rates for all coal-fired EGUs are shown below:

Table I-4. All Coal

State	SO_2 Mass	Heat Input	SO_2 Rate	State	SO_2 Mass	Heat Input	SO_2 Rate
CT	915	30,494,774	0.0600	IL	52,260	1,032,913,414	0.1012
DE	6,877	53,729,573	0.2560	IN	184,979	1,183,751,273	0.3125
MA	15,976	101,700,315	0.3142	MI	30,911	714,421,520	0.0865
MD	12,891	255,974,177	0.1007	OH	149,190	1,291,957,283	0.2310
NH	3,560	38,335,281	0.1857	WI	21,100	453,687,252	0.0930
NJ	4,226	62,812,030	0.1346				
NY	20,848	181,042,512	0.2303				
PA	133,087	1,068,514,484	0.2491				
VA	18,790	279,184,954	0.1346				

If only coal-fired units with a nameplate rating of 100MW or greater are to be considered, the "predicted" statewide average annual SO2 emission rates are shown below:

Table I-5. >100 MW Coal

State	SO_2 Mass	Heat Input	SO_2 Rate	State	SO_2 Mass	Heat Input	SO_2 Rate
CT	915	30,494,774	0.0600	IL	42,489	991,323,073	0.0857
DE	6,877	53,729,573	0.2560	IN	159,449	1,149,099,381	0.2775
MA	14,861	93,738,547	0.3171	MI	21,018	653,861,186	0.0643
MD	11,412	250,831,639	0.0910	OH	130,335	1,241,187,821	0.2100
NH	1,565	30,332,534	0.1032	WI	15,199	432,619,948	0.0703
NJ	3,582	59,793,990	0.1198				
NY	15,695	160,893,978	0.1951				
PA	119,772	1,034,993,798	0.2314				
VA	15,312	250,443,277	0.1223				

Assessment 2

Table I-6. NOx Table

State	NOx Tons	NOx Rate	0.125	Red. 0.125	% Red. 0.125	0.1	Red. 0.10	% Red. 0.10	0.07	Red. 0.07	% Red. 0.07	Heat Input
IL	119967	0.226	66295	53672	45	53036	66931	56	37125	82842	69	1060713465
IN	196135	0.306	80199	115935	59	64159	131975	67	44912	151223	77	1283188639
MI	103474	0.275	46998	56476	55	37598	65875	64	26319	77155	75	751966181
OH	235126	0.355	82817	152309	65	66254	168872	72	46378	188749	80	1325072026
WI	47343	0.190	31099	16244	34	24879	22464	47	17415	29927	63	497577808
LADCO TOTAL	702043	0.285	307407	394636	56	245926	456117	65	172148	529895	75	4918518119
PA	175218	0.286	76626	98592	56	61301	113917	65	42911	132308	76	1226016925
NY	30871	0.109	30871	0	0	28384	2487	8	19869	11002	36	567686169
NJ	9143	0.096	9143	0	0	9143	0	0	6659	2483	27	190267033
MD	35922	0.263	17048	18875	53	13638	22284	62	9547	26376	73	272761427
VA	43017	0.237	22652	20365	47	18122	24895	58	12685	30332	71	362431406
MA	9353	0.068	9353	0	0	9353	0	0	9353	0	0	274620434
NH	4641	0.096	4641	0	0	4641	0	0	3373	1268	27	96364833
CT	3116	0.067	3116	0	0	3116	0	0	3116	0	0	92717786
DE	8936	0.279	4003	4934	55	3202	5734	64	2241	6695	75	64042015
ME	680	0.022	680	0	0	680	0	0	680	0	0	61863689
DC	94	0.280	42	52	55	33	60	64	23	70	75	668330
RI	462	0.017	462	0	0	462	0	0	462	0	0	55392442
VT	296	0.140	263	32	11	211	85	29	147	148	50	4214041
OTC TOTAL	321749	0.197	204315	117434	36	163452	158297	49	114417	207333	64	3269046530
AL	112614	0.240	58697	53917	48	46958	65656	58	32870	79744	71	939155771
FL	155451	0.197	98770	56681	36	79016	76435	49	55311	100140	64	1580319063
GA	105894	0.221	59900	45994	43	47920	57974	55	33544	72350	68	958401269
KY	157847	0.319	61918	95929	61	49535	108312	69	34674	123173	78	990691497
MS	41917	0.237	22110	19807	47	17688	24229	58	12381	29535	70	353752142
NC	54652	0.144	47283	7369	13	37826	16826	31	26478	28174	52	756524591
SC	42045	0.190	27615	14430	34	22092	19953	47	15465	26581	63	441843531
TN	85543	0.294	36392	49151	57	29114	56430	66	20380	65164	76	582275154
WV	97331	0.228	53329	44002	45	42663	54668	56	29864	67467	69	853266499
Other State Total	853294	0.229	466014	387280	45	372811	480483	56	260968	592326	69	7456229518
TOTAL	1877087	0.240	977737	899350	48	782190	1094897	58	547533	1329554	71	15643794167

Table I-7. SO2 Table

State	SO2 tons	SO2 Rate	0.3	Red. 0.3	% Red.0.3	0.23	Red. 0.23	% Red. 0.23	0.2	Red. 0.20	% Red. 0.20	0.15	Red. 0.15	% Red. 0.15	Heat Input
IL	257431	0.485	159107	98324	38	121982	135449	53	106071	151360	59	79554	177877	69	1060713465
IN	593154	0.925	192478	400676	68	147567	445587	75	128319	464835	78	96239	496915	84	1283188639
MI	326501	0.868	112795	213706	65	86476	240024	74	75197	251304	77	56397	270103	83	751966181
OH	709995	1.072	198761	511234	72	152383	557611	79	132507	577487	81	99380	610614	86	1325072026
WI	129695	0.521	74637	55058	42	57221	72473	56	49758	79937	62	37318	92376	71	497577808
LADCO TOTAL	2016775	0.820	737778	1278997	63	565630	1451145	72	491852	1524923	76	368889	1647886	82	4918518119
PA	831915	1.357	183903	648012	78	140992	690923	83	122602	709313	85	91951	739964	89	1226016925
NY	65427	0.231	65427	0	0	65284	143	0	56769	8658	13	42576	22850	35	567686169
NJ	21204	0.223	21204	0	0	21204	0	0	19027	2177	10	14270	6934	33	190267033
MD	227198	1.666	40914	186283	82	31368	195830	86	27276	199921	88	20457	206740	91	272761427
VA	125985	0.695	54365	71620	57	41680	84306	67	36243	89742	71	27182	98803	78	362431406
MA	46347	0.338	41193	5154	11	31581	14766	32	27462	18885	41	20597	25751	56	274620434
NH	36895	0.766	14455	22440	61	11082	25813	70	9636	27259	74	7227	29668	80	96364833
CT	3955	0.085	3955	0	0	3955	0	0	3955	0	0	3955	0	0	92717786
DE	31808	0.993	9606	22202	70	7365	24444	77	6404	25404	80	4803	27005	85	64042015
ME	1041	0.034	1041	0	0	1041	0	0	1041	0	0	1041	0	0	61863689
DC	212	0.634	100	111	53	77	135	64	67	145	68	50	162	76	668330
RI	18	0.001	18	0	0	18	0	0	18	0	0	18	0	0	55392442
VT	2	0.001	2	0	0	2	0	0	2	0	0	2	0	0	4214041
OTC TOTAL	1392007	0.852	436183	955825	69	355648	1036359	74	326905	1065102	77	245178	1146829	82	3269046530
AL	357547	0.761	140873	216673	61	108003	249544	70	93916	263631	74	70437	287110	80	939155771
FL	263745	0.334	237048	26697	10	181737	82008	31	158032	105713	40	118524	145221	55	1580319063
GA	514539	1.074	143760	370779	72	110216	404323	79	95840	418699	81	71880	442659	86	958401269
KY	344356	0.695	148604	195753	57	113930	230427	67	99069	245287	71	74302	270055	78	990691497
MS	65317	0.369	53063	12254	19	40681	24635	38	35375	29941	46	26531	38785	59	353752142
NC	227030	0.600	113479	113551	50	87000	140030	62	75652	151378	67	56739	170291	75	756524591
SC	157190	0.712	66277	90914	58	50812	106378	68	44184	113006	72	33138	124052	79	441843531
TN	208069	0.715	87341	120728	58	66962	141107	68	58228	149842	72	43671	164398	79	582275154
WV	301574	0.707	127990	173584	58	98126	203449	67	85327	216248	72	63995	237579	79	853266499
Other State Total	2439368	0.654	1118434	1320933	54	857466	1581901	65	745623	1693745	69	559217	1880150	77	7456229518
TOTAL	5848149	0.748	2292395	3555755	61	1778744	4069405	70	1564379	4283770	73	1173285	4674865	80	15643794167

LADCO Analysis

Based on this plant-level, unit-level analysis of coal-fired units, the LADCO States identified the following achievable annual average emission rates:

Table I-8. NOx and SO_2 Analysis

NOx					
Year	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**
2008	0.23	0.305	0.29	0.36	0.21
2013	0.11 – 0.12	0.297	0.18	0.24	0.13
2014	0.11 – 0.12	0.171	0.15	0.18	0.12
2015	0.11 – 0.12	0.165	0.13	0.17	0.10
2017	0.11 – 0.12	0.114	0.11	0.12	0.09
SO2					
Year					
2008	0.50	0.93	0.91	1.09	0.57
2013	0.24 – 0.44	0.67	0.58	0.75	0.39
2014	0.20 -0.43	0.66	0.45	0.65	0.39
2015	0.19 – 0.28	0.66	0.37	0.65	0.25
2017	0.15 – 0.23	0.25	0.25	0.256	0.16

It should be noted that the analysis is based on coal-fired units. Consideration of all units (coal, oil, gas, and biomass) will result in emission rates slightly below those indicated above.

The number of post-combustion controls assumed in this analysis is provided below. The total amount of mega-wattage controlled in each state is on the order of 80-90%.

Table I-9. Analysis of Post-combustion Controls by Year

	NOx																**SO2**				
	SCR					**SNCR**					**ALL**						**FGD**				
	IL	IN	MI	OH	WI	IL	IN	MI	OH	WI	IL	IN	MI	OH	WI		IL	IN	MI	OH	WI
2008		23	3	19	1		4	0	15	1	17	27	3	34	2		6	23	2	16	1
2013		23	7	25	5		7	0	11	8	32	30	7	36	13		20	29	7	25	6
2014		23	12	26	5		7	0	11	8	34	30	12	37	13		29	29	12	33	6
2015		23	17	27	5		17	0	11	15	36	40	17	38	20		35	29	17	33	6
2017		32	25	34	8		17	0	14	15	36	49	27	48	23		37	48	27	41	13

Note: IL and OH numbers reflect number of units controlled, and IN and WI numbers reflect number of installations (which may cover several units).

APPENDIX II – Timing

Example 1: Case Study

Maryland Healthy Air Act
Deadlines and the Installation of Control Equipment

BACKGROUND

In April of 2006, the Maryland General Assembly adopted the Maryland Healthy Air Act. The bill was signed into law on April 6, 2006. In general, the law required significant reductions in Nitrogen Oxides (NOx), Sulfur Dioxide (SO2) and Mercury (HG) from electricity generating units (EGUs) in Maryland. It also required Maryland to join the Regional Greenhouse Gas Initiatve (RGGI), the first cap-and-trade program to tackle CO2 in the Country.

Portions of Maryland are nonattainment for the federal Ozone and PM2.5 Standards. NOx reductions were a critical part of Maryland's plan to reduce ground level ozone. Reductions in SO2 and NOx are both important to the States plans to lower fine particle levels. Maryland also had multiple issues with mercury and the Chesapeake Bay.

The Healthy Air Act was driven by the concept that the emission reductions from the Healthy Air Act would be important to the States own efforts to solve its air quality problems. It did, however, recognize that Maryland had a responsibility under the Clean Air Act to reduce pollution to also help downwind neighbors.

The implementing regulations were put on a fast track and were adopted on January 18th, 2007.

The Healthy Air Act includes two phases of reductions: 2009 and 2012 for NOx and 2010 and 2012 for SO2 and mercury. Table 1 below summarizes the additional NOx and SO2 reductions required in 2009, 2010, 2012 and 2013.

Table 1
Maryland Healthy Air Act Emission Reductions

	2009	2010	2012	2013
NOx	70%		75%	
SO2		80%		85%
Mercury		80%		90%

Because of pre-2006 control programs like the OTC NOx Budget Rule, total NOx reductions from Maryland EGUs between 1990 and 2012 are estimated to be over 85%.

THE DEADLINES

While the Healthy Air Act was being debated, there was considerable concern raised over the issue of timing. In general, Maryland's two major power generators argued that the 2 years to install NOx controls and the 2 ½ to 3 years to install SO2 and Mercury controls were a huge and perhaps impossible challenge. Over 60% of Maryland's electricity comes from coal.

Maryland's largest generator (3 plants – 9 units) argued that the only feasible way to install the controls required by the Healthy Air Act was to go in series (plant-by-plant) and that a plant-by-plant approach could take over 6 years.

As a result of this debate, the law included several waiver provisions to allow affected sources more time, without penalty, if such delays could be justified. For Phase 1 (2009 for NOx and 2010 for SO2 and HG) there have been no requests for waivers. Both of Maryland's major generators have installed their controls in parallel, not in series (plant-by-plant).

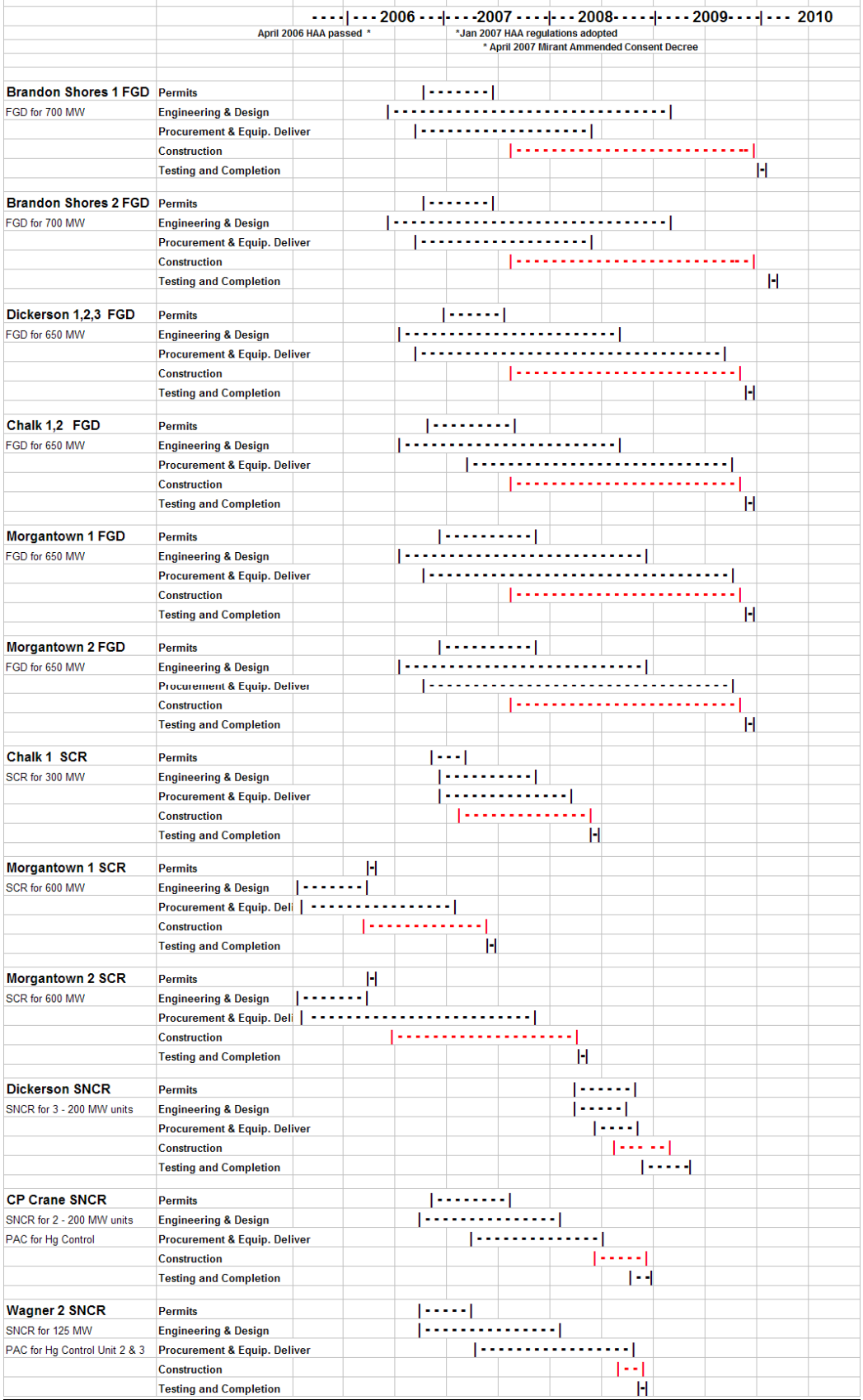
Because of the Healthy Air Act, by 2010, over $2 Billion will have been invested in new control equipment (6 scrubbers, 3 SCRs, 6 SNCRs). Four SCRs and numerous combustion modifications had been installed on coal fired power plants in the Maryland prior to the Healthy Air Act.

Table 2 below summarizes the planning and installation schedules for the six largest plants in the State.

Construction schedules for the FGD ran approximately 28 months each. Engineering economies were realized by using the same size FGD for the four Mirant installations. While the number of units served by each FGD in the three plants in the Mirant system varied, the total MW of capacity feeding each FGD was approximately the same at about 600 MW. This allowed the same engineering design to be used for each FGD. The two FGD at Brandon Shores are also identical to each other.

While the use of two FGD designs assisted with the timely completion of the six projects, material handling design and ductwork to and from the FGDs were different at each site. Three of the FGD projects had to deal with SCR construction occurring simultaneous to the FGD construction, and accommodations for crane availability had to be carefully scheduled. All of the FGD's required new stacks with fiber glass liners. The liners were constructed on site and the equipment installed to fabricate the liners the required permits to construct from MDE.

Table 2 Healthy Air Act Project Time Line in Maryland



Brandon Shores 1 FGD	**Permits**
FGD for 700 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Brandon Shores 2 FGD	**Permits**
FGD for 700 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Dickerson 1,2,3 FGD	**Permits**
FGD for 650 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Chalk 1,2 FGD	**Permits**
FGD for 650 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Morgantown 1 FGD	**Permits**
FGD for 650 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Morgantown 2 FGD	**Permits**
FGD for 650 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Chalk 1 SCR	**Permits**
SCR for 300 MW	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
Morgantown 1 SCR	**Permits**
SCR for 600 MW	**Engineering & Design**
	Procurement & Equip. Deli
	Construction
	Testing and Completion
Morgantown 2 SCR	**Permits**
SCR for 600 MW	**Engineering & Design**
	Procurement & Equip. Deli
	Construction
	Testing and Completion
Dickerson SNCR	**Permits**
SNCR for 3 - 200 MW units	**Engineering & Design**
	Procurement & Equip. Deliver
	Construction
	Testing and Completion
CP Crane SNCR	**Permits**
SNCR for 2 - 200 MW units	**Engineering & Design**
PAC for Hg Control	**Procurement & Equip. Deliver**
	Construction
	Testing and Completion
Wagner 2 SNCR	**Permits**
SNCR for 125 MW	**Engineering & Design**
PAC for Hg Control Unit 2 & 3	**Procurement & Equip. Deliver**
	Construction
	Testing and Completion

OTHER MID-ATLANTIC STATES

Between 2006 and 2009 there were other very significant efforts taking place in the Mid-Atlantic area to add scrubbers, SCRs and SNCRs. Because of state programs and the Clean Air Interstate Rule (CAIR), Virginia, New Jersey, Delaware, West Virginia and North Carolina all had significant control technology installation efforts taking place between 2006 and 2009.

CONCLUSION

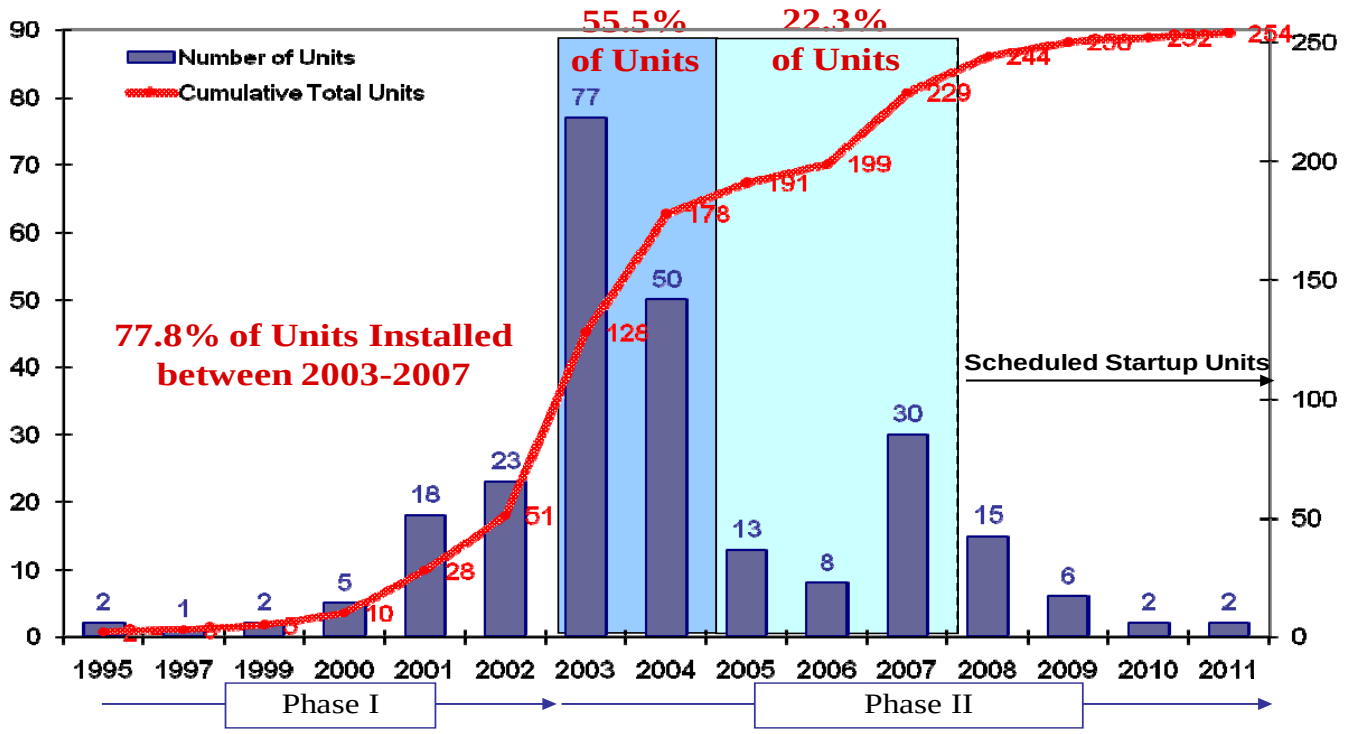
With the appropriate regulatory structure, very significant pollution control systems, including FGDs, SCRs and SNCRs, can be installed in multiple plants owned by the same company, in parallel, in a relatively short timeframe.

Supplemental Information:

- Law: http://mlis.state.md.us/2006rs/bills/sb/sb0154e.pdf
- Regulation: http://www.mde.state.md.us/assets/document/26-11-27_MD_Healthy_Air_Act.pdf

Example 2: Installation of SCR Units from EPA's NOx SIP Call

SCR Units Over Time



Minimal SCR Units
Expect Minimal NO_x Reductions

Large Number of SCR Units Installed
Expect SIGNIFICANT NO_x Reductions
Especially after 2003-2004
Ground-level ozone should decrease dramatically

Data courtesy of The Institute of Clean Air Companies (ICAC).

Appendix III – Cost of Controls

Table III-1. Available Emission Control Devices, Emission Reductions and Estimated Costs[1]

Fuel Type	Pollutant	Available Control Device	Expected Emission Reduction (%)	Control Cost Estimate[a] ($/ton removed)
Coal-Fired	NOx	Selective Non-Catalytic Reduction (SNCR)	45%	$2,500 - $3,000
		Selective Catalytic Reduction (SCR)	85%	$1,600 - $4,900
	SO_2	Flue Gas Desulfurization (FGD) system (dry scrubber)	95%	$1,500 - $3,600
		Wet FGD system (wet scrubber)	95%	$1,400 - $3,400
Residual Oil-Fired	NOx	Low NOx Burners (LNB)	50%	$1,100 - $4,400
		LNB plus Flue Gas Recirculation (FGR)	60%	$2,600 - $5,400
		Selective Non-Catalytic Reduction (SNCR)	50%	$3,100 - $4,000
		LNB plus SNCR	65%	$3,500 - $6,400
		Selective Catalytic Reduction (SCR)	85%	$2,600 - $8,300
Distillate Oil-Fired	NOx	Low NOx Burners (LNB)	50%	$2,200 - $8,700
Gas-Fired	NOx	Low NOx Burners (LNB)	50%	$2,200 - $8,700

Note: [a]Cost estimates shown are in 2008 dollars for a **250 MMBtu/hr boiler (≈ 73 MW)** operating at 66 percent capacity and operating 8,760 hours per year

[1] New Hampshire Department of Environmental Services (October 2008) Draft ICI Boiler NOx and SO_2 Control Cost Estimates [PowerPoint slides]. (Andy Bodnarik, 2009)

Table III-2 Stationary and Area Source Measures

NOx Measure	State Rules	National Measure	Emissions Reduction	Cost
Boilers serving EGUs	DE, NJ,MA, MD	*	413 TPD OTR	$1,100 - 8,700 per ton
New Small Gas Boilers	CA, TX	*	53 TPD OTR	$3,300 to $16,000 per ton
Municipal waste incinerators	NJ, MD	*	14 TPD OTR	$2,140 per ton (SNCR)
HEDD EGUs	NJ	*	TBD	$45,000 to $300,000 per unit
Stationary Generator Regulation (DG)	DE, MA, MD, NJ	*	TBD	$39,700 to $79,700 per TPD
Minor New Source Review	DE, CT, MD, MA, NJ, RI	*	TBD	$600 to $18,000 per ton
Energy security / Energy efficiency	TBD	*	TBD	TBD

Table III-3 Stationary and Area Source VOC Measures

VOC Measure	State Rules	National Measure	Emissions Reduction	Cost
AIM rule	CA	*	50 TPD OTR	$2,240 per ton
Auto Refinishing	CA	*	21 TPD OTR	$2,860 per ton
Consumer Products 2006	CA	*	19 TPD OTR	$7,700 per ton
Lower VOC Solvent Degreaser	MD, CA	*	13 TPD OTR	$1,400 per ton
Gas Stations	TBD	*	TBD	TBD
Large VOC Storage Tanks	MD, NJ	*	TBD	$2,288 to $29,000 per ton
Minor New Source Review	DE, CT, MD, MA, NJ, RI	*	TBD	TBD

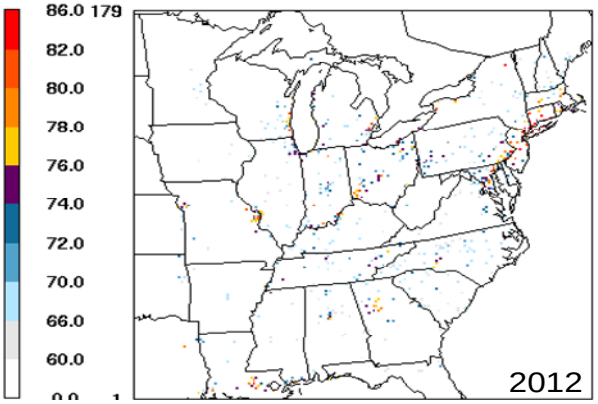
Appendix IV – Air Quality Benefits

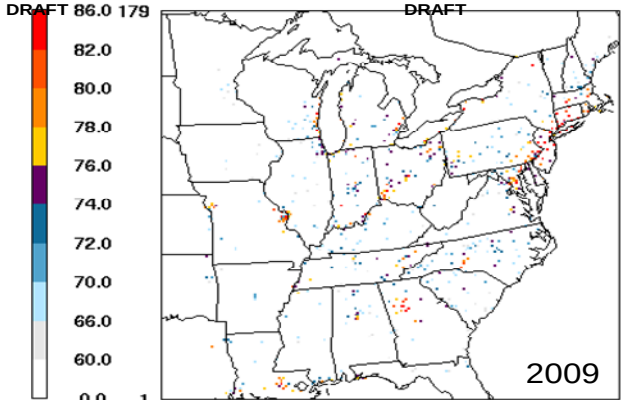
State Collaborative Modeling Results

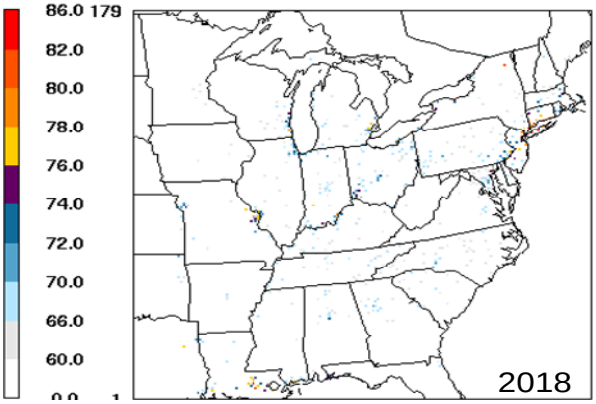
DRAFT

Ozone 8-Hour Concentrations

8-Hour - 0.08 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	1	1	8	10
2012	0	0	3	3
2018	0	0	0	0
8-Hour - 0.075 ppm NAAQS (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	50	31	66	147
2012	30	14	45	89
2018	8	2	13	23





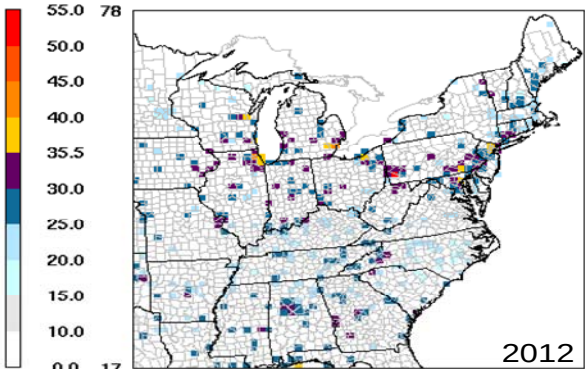


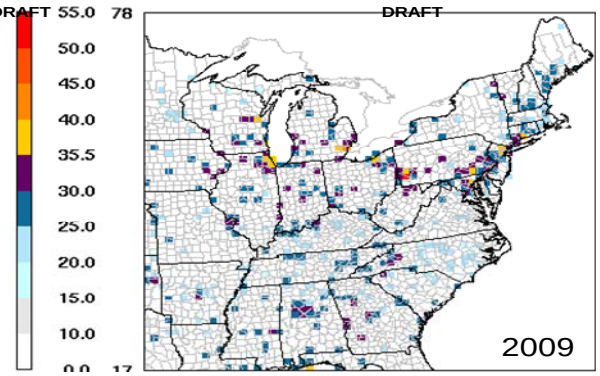
Based on 2005 meteorology

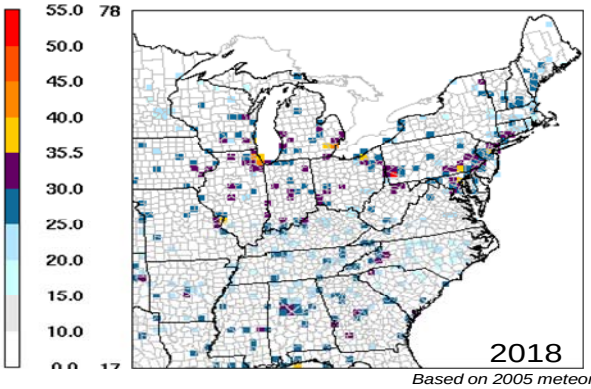
DRAFT

$PM_{2.5}$ Daily Concentrations

Daily (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	6	0	6	12
2012	6	0	5	11
2018	6	0	4	10







Based on 2005 meteorology

DRAFT

$PM_{2.5}$ Annual Concentrations

Annual (No. of Counties > NAAQS)				
	Midwest	Southeast	Northeast	Total
2009	4	3	2	9
2012	3	1	2	6
2018	2	0	1	3

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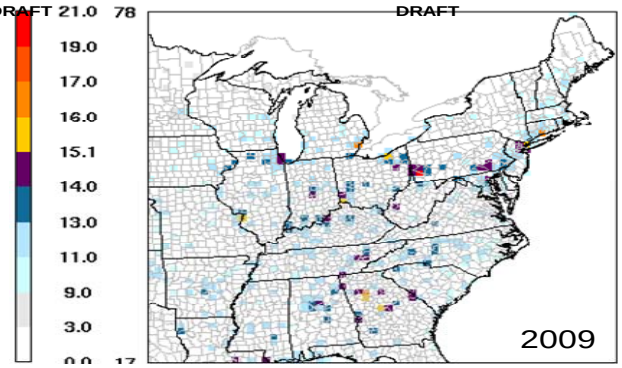

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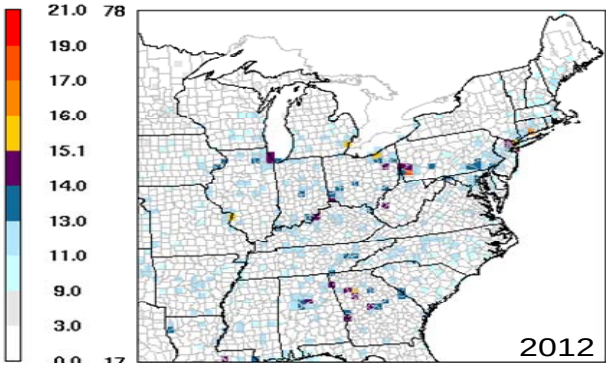
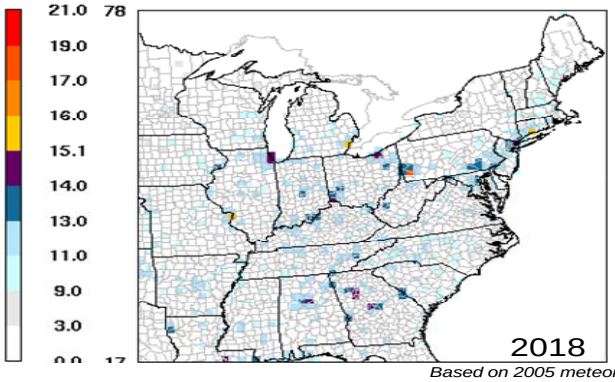
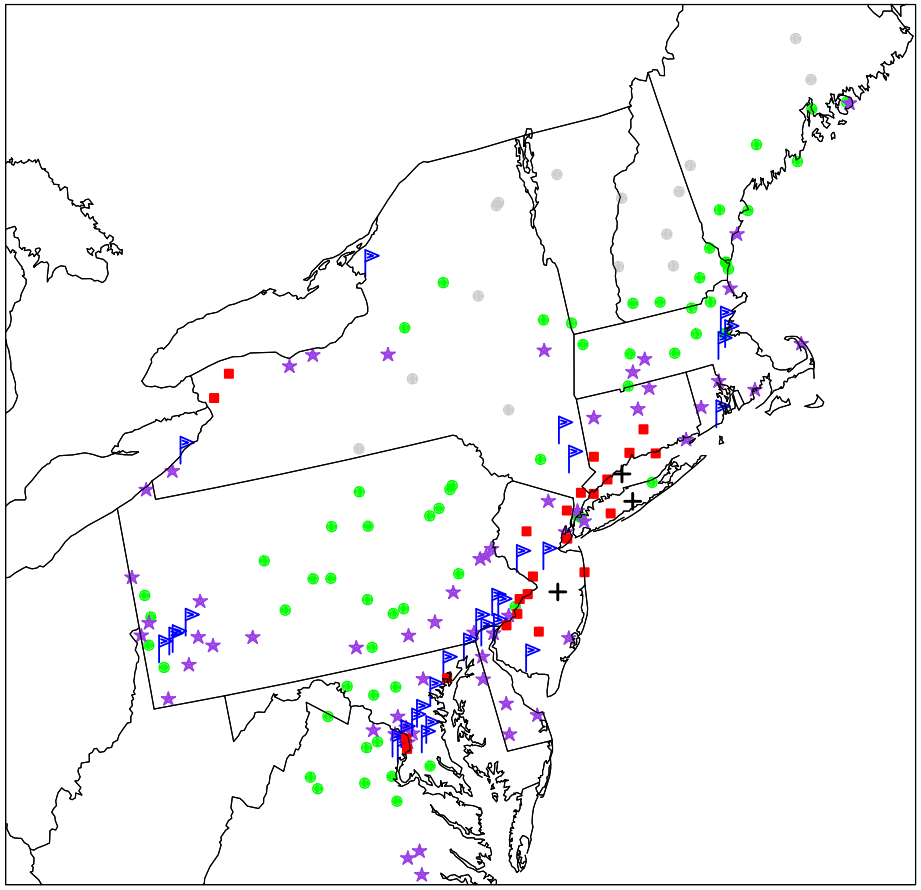




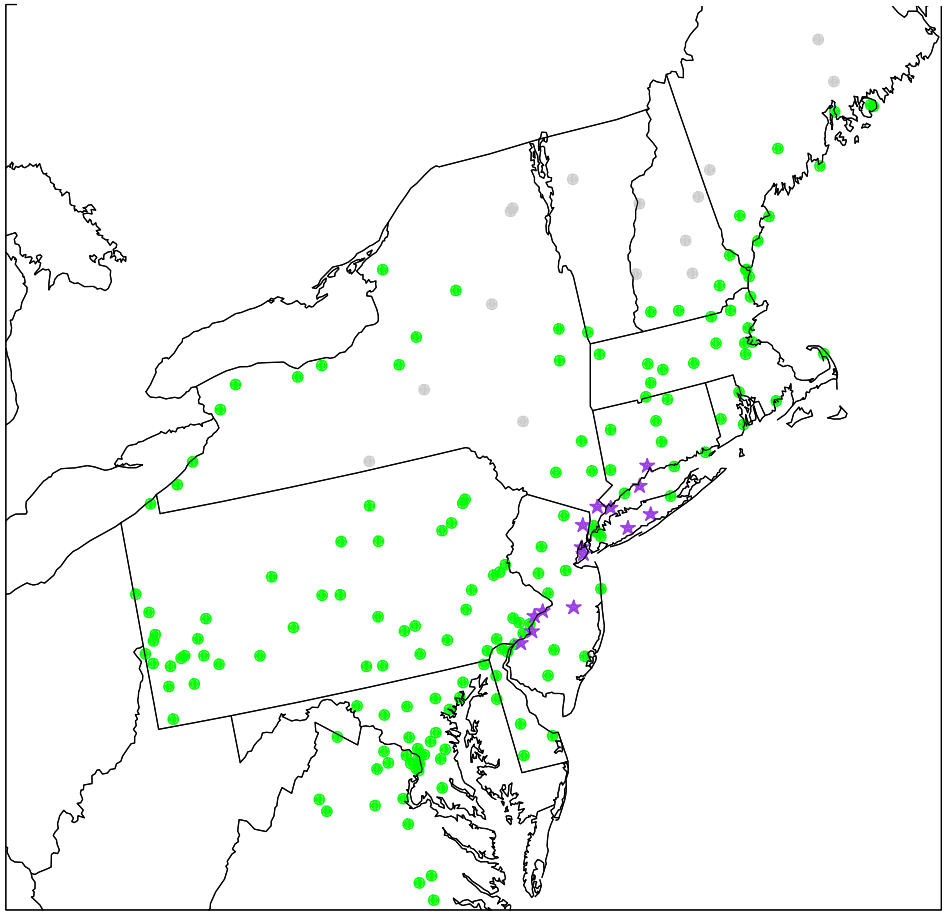
Based on 2005 meteorology

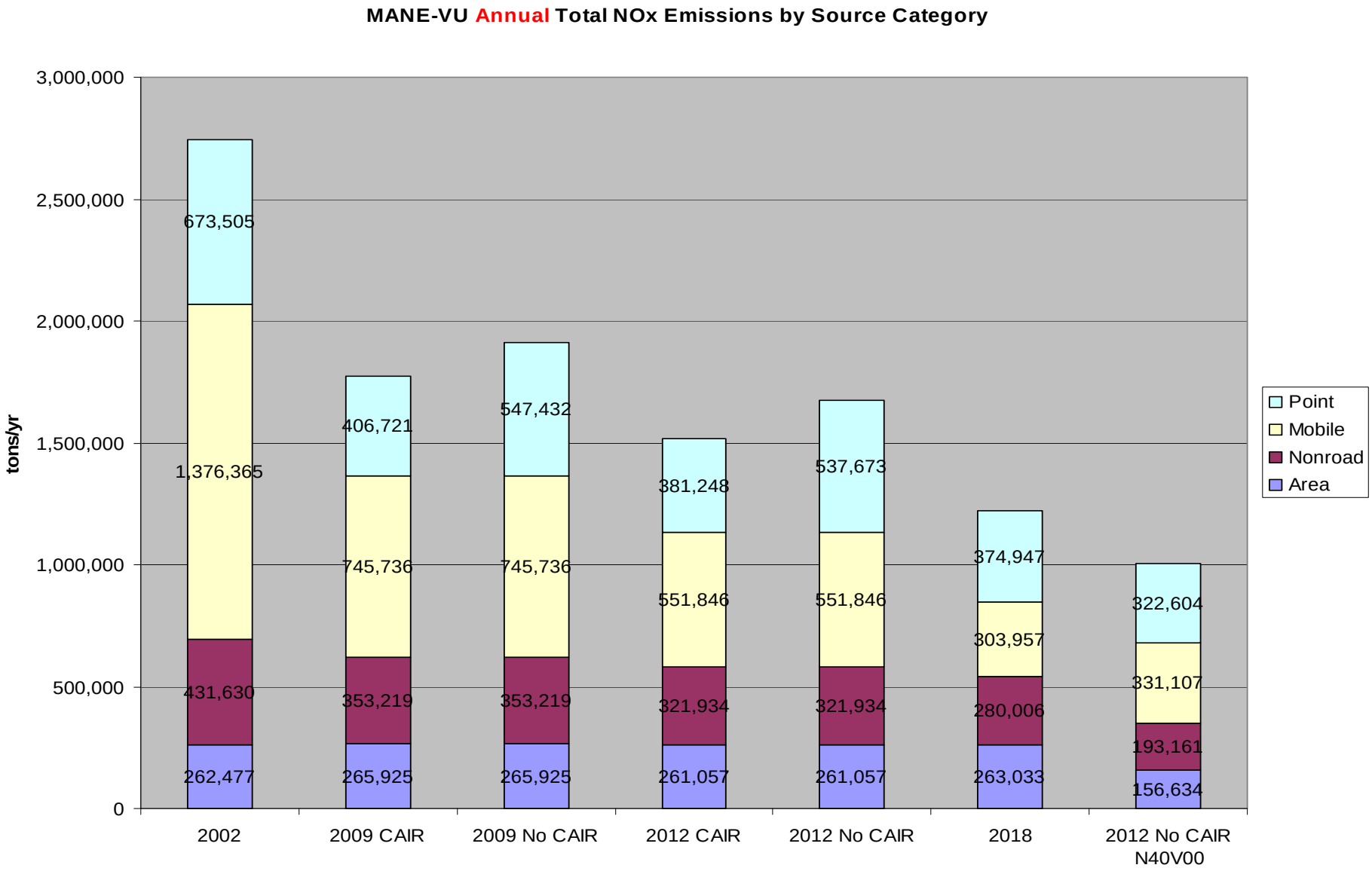
OTC Sensitivity Modeling Runs: 40% NOx Emission Reduction, All Sectors

DVF 2012 BOTB/BOTW "NoCAIR"

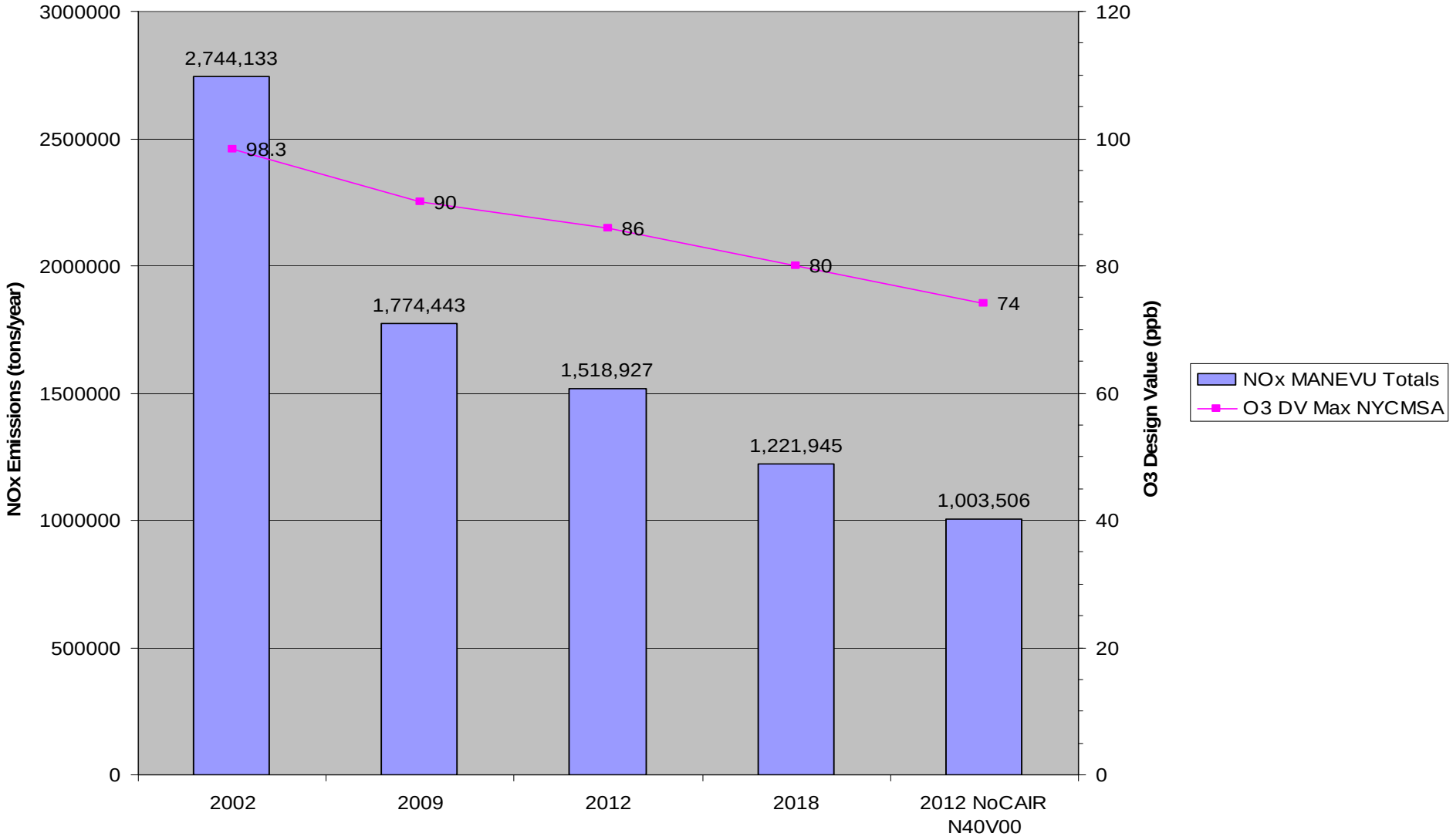


DVF 2012 BOTB/BOTW "NOCAIR" Minus 40% Across-the-Board Anthropogenic NOx




MANE-VU Annual Total NOx Emissions by Source Category
tons/yr
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
673,505
1,376,365
431,630
262,477
406,721
745,736
353,219
265,925
547,432
745,736
353,219
265,925
381,248
551,846
321,934
261,057
537,673
551,846
321,934
261,057
374,947
303,957
280,006
263,033
322,604
331,107
193,161
156,634
2002
2009 CAIR
2009 No CAIR
2012 CAIR
2012 No CAIR
2018
2012 No CAIR N40V00
Point
Mobile
Nonroad
Area

MANE-VU Annual Total NOx Emissions (All Categories) and Highest O3 8-hr Design Value in the NYCMSA



Appendix V – Other Sectors

Table V-1. Status Report on OTC State Efforts to Promulgate Regulations Based on OTC 2001 Model Rules (as of May 19, 2009)

	Consumer Products	Architectural and Industrial Maintenance Coatings	Portable Fuel Containers	Mobile Equipment Repair and Refinishing	Solvent Cleaning	Additional NOx Controls	Distributed Generation Standards	State Contacts and Links to Rules
CT	Effective	Effective	Effective	Effective (similar rule)	Effective	Alternative requirements in effect	Effective	Contact: Susan Amarello 860-424-3442 http://www.ct.gov/dep/cwp/view.asp?a=2684&q=331196&depNav_GID=1619
DE	Effective See 2006 rule	Effective	See 2006 rule	Effective	Effective	Effective	Effective 1/11/06	Contact: Gene Pettingill 302-323-4542 Reg. 24, 41, 42, and 1144 http://www.dnrec.state.de.us/air/aqm_page/regs.htm http://www.dnrec.state.de.us/air/aqm_page/pro_regs.htm
DC	Effective	Effective	See 2006 rule	Effective	Effective	NOx RACT Already in place	In progress	(202) 535
ME	Effective	Effective	See 2006 rule	Effective	Effective		Effective	Contact: Jeff Crawford 207-287-2437 http://www.maine.gov/dep/air/regulations/index.htm
MD	Effective (COMAR 26.11.32)	Effective (COMAR 26.11.33)	See 2006 rule	Effective (similar rule)	Effective (similar rule)	In progress	In progress	Contact: Gene Higa 410-631-3353 PFC: Eddie Durant Consumer Products: Husain Waheed 410-537-3240 http://www.dsd.state.md.us/comar/subtitle_chapters/26_Chapters.htm
MA	Adopted CP rule (Phase II) 10/19/2007; new standards effective 1/1/2009	Rule adopted 10/19/2007; new standards effective 1/1/2009	See 2006 rule	Effective (similar rule)	Rule adopted 3/06/2009; new standards effective 9/06/2009.	Effective (similar rule)	Rule finalized 9/2005	Contacts: Consumer products; AIM Coatings; solvents: Azin Kavian azin.kavian@state.ma.us Distributed Generation: Robert.donaldson@state.ma.us Proposed regulations: http://www.mass.gov/dep/public/publiche.htm Final regulations: http://www.mass.gov/dep/air/laws/regulati.htm
NH	Adopted (Effective January 1, 2007)	Adopted (7/27/06)	See 2006 rule	Not considering	Adopted	Under review	Effective (not based on OTC model rule)	Contact: Mike Fitzgerald 603-271-6390 Solvents: http://www.des.state.nh.us/rules/env-a1200.pdf DG: http://www.des.state.nh.us/rules/env-a3700.pdf

Table V-2. Status Report on OTC State Efforts to Promulgate Regulations Based on OTC 2001 Model Rules (as of May 19, 2009)

	Consumer Products	Architectural and Industrial Maintenance Coatings	Portable Fuel Containers	Mobile Equipment Repair and Refinishing	Solvent Cleaning	Additional NOx Controls	Distributed Generation Standards	State Contacts and Links to Rules
NJ	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Contacts: CP, PFCs: Judy Rand 609-984-1950 Additional NOx Controls, DG: Allan Willinger 609-633-1120
NY	Effective	Effective	See 2006 rule	Effective	Effective	Effective	In progress (Target effective date 07/01/10)	Contact: Ron Stannard 518-402-8396 CP: http://www.dec.state.ny.us/website/regs/ch3.htm (Part 235) AIM: http://www.dec.state.ny.us/website/regs/part205_new.html PFC: http://www.dec.state.ny.us/website/regs/239.htm MERR: ftp://www.dec.state.ny.us/dar/library/text228.pdf SC: http://www.dec.state.ny.us/website/regs/part226.html ANC: ftp://www.dec.state.ny.us/dar/library/xpt227.pdf
PA	Effective	Effective	See 2006 status report; Will rely on Fed PFC rule adopted by EPA on February 26, 2007. 72 FR 8427	Similar rule is already in place	Effective	Effective	Will consider	Contact: Susan Hoyle, shoyle@state.pa.us; 717-772-2329 Additional NOx Controls http://www.pabulletin.com/secure/data/vol34/34-50/2176.html MERR: http://www.pacode.com/secure/data/025/chapter129/s129.75.html SC: http://www.pacode.com/secure/data/025/chapter129/s129.63.html PFC: http://www.pacode.com/secure/data/025/chapter130/subchapAtoc.html CP: http://www.pacode.com/secure/data/025/chapter130/subchapBtoc.html AIM: http://www.pacode.com/secure/data/025/chapter130/subchapCtoc.html
RI	Effective 7/09,	Effective 7/09	See 2006 rule	Effective (similar rule)	Effective (similar rule) Updated 10.08	Will consider	Effective (similar rule)	Contact: Barbara Morin 401-222-2808
VT	Will consider	RACT**	See 2006 rule	RACT**	RACT**	RACT**	In progress	
VA	Effective	Effective	See 2006 rule	Effective	Effective			Contact: Gary Graham (804) 698-4103 gegraham@deq.virginia.gov AIM: http://www.deq.virginia.gov/air/pdf/airregs/449.pdf PFC: http://www.deq.virginia.gov/air/pdf/airregs/442.pdf MERR: http://www.deq.virginia.gov/air/pdf/airregs/448.pdf SC: http://www.deq.virginia.gov/air/pdf/airregs/447.pdf CP: http://www.deq.virginia.gov/air/pdf/airregs/450.pdf CP Info: http://www.deq.virginia.gov/air/consumerprod.html

** RACT determination required at the time of renewal of operating permit by state law

Table V-3. Status Report on OTC State Efforts to Promulgate Regulations Based on OTC 2006 Model Rules (as of May 19, 2009)

	Consumer Products (Phase II)	*Adhesives and Sealants*	*Portable Fuel Containers (w/ Kerosene)*	*Diesel Chip Reflash*	*Asphalt Paving*	*Regional Fuel*	*Additional NOx Controls*	*State Contacts and Links to Rules*
CT	*Effective*	*Effective*	*Effective*	*Developing an integrated heavy-duty diesel truck strategy*	*Rule adoption proceeding.*	*Effective statewide*	*Under evaluation as part of a multi-pollutant planning effort*	*Contact:* *Susan Amarello 860-424-3442* *http://www.ct.gov/dep/cwp/view.asp?a=2684&q=331196&depNav_GID=1619*
DE	*Effective April 11, 2009*	*Effective April 11, 2009*	*Relying on federal rule*	*Developing strategy*	*Similar rule already in effect*	*Already in effect statewide*	*Effective on July 11, 2007*	*Adhesives, PFC, Asphalt, Consumer Products: Gene Pettingill 302-323-4542* *Regional Fuel, Chip Reflash: Phil Wheeler (302) 739-9402* *Additional NOx Controls: Frank Gao (302)0323-4542* *http://regulations.delaware.gov/AdminCode/title7/1000/1100/1141.shtml#TopOfPage*
DC	*Proposed May 2007; addressing public comments*	*Proposed May 2007; addressing public comments*	*Proposed May 2007*	*No Action*	*No Action*	*No Action*	*No Action*	*Contact: Cecily Beall (202) 535-2626*
ME	*Rule adopted, Standards effective Jan 1, 2009*	*Scheduled for adoption 5/21/09*	*Draft rule under development*	*No action*	*Scheduled for public hearing 6/18/09*	*No Action*	*No Action*	*Contact: Jeff Crawford 207-287-2437* *http://www.maine.gov/dep/air/regulations/index.htm*
MD	*Proposal publication 03/31/07; Hearing 5/1/07; Final Reg Pub 06/08/07; Effective 06/18/07*	*Rule adopted February 5, 2008; new standards effective April 7, 2008.* *Single Ply Roof Amendment: Adopted 04/29/09; Published 05/22/09; Effective 06/01/09*	*Proposal publication 03/31/07; Hearing 5/1/07; Final Reg Pub 06/08/07; Effective 06/18/07*	*No action*	*Under review*	*Presently in nonattainment areas, will consider regional fuel for attainment areas*	*Distributed Generation regulation: Proposal publication 10/24/08; Hearing 11/25/08; Final Reg Pub 05/08/09; Effective 05/18/09* *Partial HEDD consent order 2008.*	*Contacts:* *PFC: Eddie Durant* *Consumer Products, Adhesives: Husain Waheed* *DG: Randy Mosier* *410-537-3240*
MA	*Rule adopted 10/19/2007; new standards effective 1/1/2009*	*Rule under development.*	*Will rely on 2007 Federal PFC rule (72 FR 8427) .*	*No action*	*Rule under development.*	*Already have RFG statewide*	*Under review*	*Contacts:* *Consumer products; Adhesives and Sealants; Asphalt Paving: Azin Kavian azin.kavian@state.ma.us* *Proposed regulations: http://www.mass.gov/dep/public/publiche.htm* *Final regulations: http://www.mass.gov/dep/air/laws/regulati.htm*

Table V-4. Status Report on OTC State Efforts to Promulgate Regulations Based on OTC 2006 Model Rules (as of May 19, 2009)

	Consumer Products (phase II)	Adhesives and Sealants	Portable Fuel Containers (w/ Kerosene)	Diesel Chip Reflash	Asphalt Paving	Regional Fuel	Additional NOx Controls	State Contacts and Links to Rules
NH	Draft rule under development (on hold)	Draft rule under development (on hold)	Adopted	No action	Under review	Under consideration	Under review	Contact: Mike Fitzgerald 603-271-6390 Solvents: http://www.des.state.nh.us/rules/env-a1200.pdf DG: http://www.des.state.nh.us/rules/env-a3700.pdf Send annual date code update information to: airfiles@des.nh.gov
NJ	Adopted 10/30/08	Adopted 10/30/08	Adopted 10/30/08	No action	Adopted 3/20/09	RFG in place state wide	Adopted 3/20/09	http://www.state.nj.us/dep/aqm/ Contacts: CP, PFCs, Adhesives: Judy Rand 609-984-1950. Asphalt Paving: Stella Oluwaseun-Apo 609-777-0430 Diesel Chip Reflash: John Gorgol 609-292-1413 Additional NOx Controls: Allan Willinger 609-633-1120
NY	Proposed Hearings 7/09	In progress	Adopted 06/30/09	Evaluating court decision	In progress	Under consideration	In progress	Contact: Ron Stannard 518-402-8396
PA	Final rulemaking scheduled for Environmental Quality Board consideration June 16, 2008; Anticipated effective date for new categories is Jan 1, 2009	Proposed Rulemaking schedule for Environmental Quality Board consideration August 17, 2008; Anticipated effective date is May 1, 2009	Will rely on Fed PFC rule adopted by EPA on February 26, 2007. 72 FR 8427	No plans to pursue at this time.	Under consideration	Under consideration	Cement Kiln and Glass Furnace regulations' public comment periods close June 23, 2008; Anticipated effective date is May 1, 2009	Contact: Susan Hoyle 717-772-2329 **shoyle@state.pa.us** www.depweb.state.pa.us/pubpartcenter/site/default.asp www.pacode.com/ www.pabulletin.com/
RI	Rule Adopted May 2009, limits effective 7/1/09	Rule Adopted May 2009, limits effective 7/1/09	Will rely on federal rule.	No plans to pursue	Hearing on rule 2/09, limits will be effective 5/10	RFG in place state wide	No plans at this time to implement this measure.	Contact: Barbara Morin 401-222-2808 barbara.morin@dem.ri.gov
VT	No plan to adopt	Plan to pursue	Plan to pursue	Plan to pursue depending on legal basis	Considering	Under consideration, would adopt if truly regional	No plans at this time to implement this measure.	
VA	Notice of intended regulatory action	Notice of intended regulatory action	Notice of intended regulatory action	No current plans to pursue.	No current plans to pursue.	No current plans to pursue.	No current plans to pursue.	Contact: Gary Graham (804) 698-4103 gegraham@deq.virginia.gov

LAKE MICHIGAN AIR DIRECTORS
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September 10, 2009

The Honorable Lisa P. Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW, Mail Code 1101A
Washington, DC 20460

Dear Administrator Jackson:

On September 2, 2009, the five LADCO States, along with 12 other States in the eastern half of the U.S., sent recommendations to the Environmental Protection Agency (EPA) as it develops a replacement rule for the Clean Air Interstate Rule, in light of the December 23, 2008, remand by the U.S. Court of Appeals for the D.C. Circuit.

The recommendations follow through on the commitment we made in the March 9, 2009, Framework Document to work together to address the transport requirements of Section 110(a)(2)(D) of the Clean Air Act (CAA), and to attain the ozone and PM2.5 National Ambient Air Quality Standards (NAAQS). Please understand that in preparing these recommendations our fundamental air quality objective is to achieve attainment and ensure maintenance of the NAAQS as expeditiously as practicable.

Consistent with the September 2, 2009, joint letter, we wish to provide further recommendations on two issues: the EGU point source strategy (in the national/regional control program), and the state-led attainment planning process. Our specific recommendations are provided below.

LADCO Recommendation 1

A. National/Regional Control Program

1. EGU point source strategy (applicable to units ≥ 25 MW)

Regional Emissions Cap: We recommend that EPA establish regional emissions caps (as referenced in the September 2, 2009, joint letter) effective by 2017. We believe that regional emissions caps for any earlier year (e.g., 2015) should not be established, either in addition to or in lieu of a 2017 cap. We conducted a state-by-state analysis of what level of EGU control for NOx and SO2 is achievable over the next several years. A fundamental assumption in our analysis is a July 2012 start date for the planning, engineering, and construction of any new NOx and SO2 controls. This date reflects a January 2011 promulgation date for a CAIR replacement rule and another 18 months for adoption of state rules. Four "layers" of control were considered: (1) all NOx and SO2 controls to comply with the original CAIR Phase I program, (2) optimization of existing NOx and SO2 controls by 2014, (3) application of low capital cost NOx controls (e.g., combustion modifications) by 2015, and (4) installation of new NOx and SO2 controls (e.g., SCRs for NOx and FGDs for SO2) by 2017. We believe that the first three measures identified above are all that can be done by 2015.

Performance Standards: We understand that EPA is considering a hybrid approach in its CAIR replacement rule involving regional emissions trading and unit-specific performance standards (cite: July 9, 2009, testimony by Regina McCarthy before the Subcommittee on Clean Air and Nuclear Safety, Committee on Environment and Public Works, U.S. Senate). As discussed in the September 2, 2009, joint letter, we strongly support and encourage EPA to include regional emissions trading to the fullest extent allowed under the Clean Air Act.

We believe, however, that unit-specific performance standards go beyond the requirements of section 110 and the scope of a CAIR replacement rule; inhibit trading; and that performance standards with a near-term compliance timeframe, such as 2017, are not practical for all EGUs. Although we firmly believe that it is not appropriate to include performance standards in a CAIR replacement rule, if EPA decides to consider including performance standards, then EPA should work with the states to take into account the basis and timing of the requirements identified in the September 2, 2009, joint letter, cost effectiveness, site specific factors (such as space limitations) and the pollution control equipment already in place on the existing fleet of EGUs. Specifically, on this last point, we believe that EPA should not require replacement or repowering of units or control systems that are sound technology and operating at a reasonable effectiveness.

LADCO Recommendation 2

B. State- Led Attainment Planning

We recommend the use of a state-led attainment planning process concurrent with developing the transport SIP to address areas of interest that are not expected to attain after implementation of the national/regional control program. The advantages of this state-led planning effort include:

- A one-size-fits-all federal solution cannot provide the most appropriate and cost-effective solution for each area;
- Attainment planning is more effective and more likely to succeed if it is done on a non-attainment area basis with a limited number of states;
- Additional controls are identified where they are needed; and
- States maintain their responsibility under the Clean Air Act to establish state implementation plans.

A major contributing state (i.e., a state which contributes at least 4% to a downwind area of interest that is not expected to attain after implementation of the national/regional program) must also either:

1. In conjunction with other major contributing states, develop, adopt, and implement an appropriate attainment strategy for the area of interest, as follows:

    a. An upwind state's responsibility for achieving air quality benefits in a downwind area should be commensurate with the magnitude of the upwind state's contribution to the downwind air quality problem.
    b. To facilitate flexibility in developing control programs and reduce control costs, state planning efforts should accommodate interstate emissions trading to the fullest extent allowed by the Clean Air Act.
    c. Photochemical modeling, performed in accordance with EPA modeling guidance, should be conducted to determine the amount of emission reduction needed to provide

for attainment and the relative contributions of the participating states and source sectors, and to assess candidate control measures.

2. In the event that the multi-state planning effort is unsuccessful, then each 4% state may still be able to satisfy its section 110(a)(2)(D) obligation if it can demonstrate to EPA that it has emission reductions measures for significantly contributing source categories that are commensurate with a Reasonably Available Control Measure analysis for the affected area. These measures should be determined by first identifying key pollutants and source categories that contribute to the air quality problem, and then identifying and evaluating control measures for the contributing source categories.

Enclosed please find supporting materials for these recommendations.

If you wish clarification of these comments, then please contact Michael Koerber, Lake Michigan Air Directors Consortium.

Sincerely,

Douglas P. Scott
Director, Illinois Environmental Protection Agency

Thomas Easterly
Commissioner, Indiana Department of Environmental Management

Steven E. Chester
Director, Michigan Department of Environmental Quality

Christopher Korleski
Director, Ohio Environmental Protection Agency

Matthew J. Frank
Secretary, Wisconsin Department of Natural Resources

Enclosure

c: Regina McCarthy, Assistant Administrator, Office of Air and Radiation, U.S. EPA
Bharat Mathur, Acting Regional Administrator, U.S. EPA, Region V
Cheryl Newton, Director, Air and Radiation Division, U.S EPA, Region V

Supporting Materials

LADCO Recommendations to EPA on a CAIR Replacement Rule

The purpose of this document is to review LADCO's recommendations to EPA on a CAIR replacement rule, along with the rationale and any supporting materials.

Introduction

Section 110(a)(2)(D) requires SIPs to…

> "… contain adequate provisions – (i) prohibiting…any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will –
>
> (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any (NAAQS)…, or
>
> (II) interfere with measures required to be included in the applicable implementation plan for any other State under part C to prevent significant deterioration of air quality or to protect visibility…"

In its decision, the U.S. Court of Appeals for the D.C. Circuit rejected EPA's approach in CAIR in which it gave "interfere with maintenance" much the same meaning as "contribute significantly to nonattainment". The Court discussed the problem of areas struggling to meet the National Ambient Air Quality Standards (NAAQS) – i.e., areas which "could fall back into nonattainment because of the historic variability" in their air quality levels. It is, therefore, necessary for EPA to independently address the "contribute significantly to nonattainment" and "interfere with measures" provisions of section 110(a)(2)(D).

To ease the administrative (and technical) burden, LADCO recommends that a necessary first step in addressing significant contribution and interference with maintenance is to identify the downwind areas of interest. (Note: LADCO's recommended test is broad enough to consider "historic variability", as instructed by the Court.) For those areas, a threshold level is proposed to determine which upwind states need to be considered for emission reductions. A 2-part, multi-sector process is then recommended to meet Clean Air Act requirements.

In summary, a 3-step approach is proposed to address the transport requirements of section 110(a)(2)(D):

(1) identify areas of interest;

(2) identify upwind states which contribute significantly to nonattainment or interfere with maintenance in these areas, and

(3) implement a multi-sector approach, as necessary, to provide an appropriate remedy to meet Clean Air Act requirements.

Identifying Areas of Interest

LADCO Recommendation:

A. While the requirements of Section 110(a)(2)(D) apply to all areas, most attention should be given to those areas not meeting or struggling to maintain the NAAQS. These "areas of interest" should be identified using monitoring and modeling data.

B. Specifically, these are areas with both base monitored design values and future modeled design values above the applicable NAAQS should be designated as areas of interest. The monitored design values are based on the maximum design value from the periods 2003-2005 through the most recent three-year period, and the future modeled values are based on future year modeling which reflects legally enforceable control measures and a conservative model attainment test - i.e., use of maximum design values rather than average design values.

    1. The use of maximum design values and a conservative model attainment test are intended to account for historic variability, which is necessary to ensure maintenance. An alternative means of accounting for historic variability is to conduct a statistical analysis of the year-to-year variation in meteorology.

    2. Requiring a more conservative model attainment test will necessitate a change in EPA's modeling guidance. EPA should also establish performance criteria to insure that the modeling is capturing transport appropriately.

    3. EPA's approach in CAIR also reflects a "monitored and modeled" test to identify areas of interest.

Discussion: In the Clean Air Interstate Rule (CAIR), EPA relied on a “modeled plus monitored” test to identify the areas of interest. Specifically, a county had to have both a measured design value for the most recent period of available ambient data (i.e., 2001-2003) and a modeled value for the 2010 base case above the air quality standard to qualify “as the downwind receptors for determining which upwind States make a significant contribution” in downwind States. EPA identified 62 counties for PM2.5 and 40 counties for ozone.

EPA was challenged by the State of North Carolina on its test to identify areas of interest. North Carolina argued that EPA’s test should address areas that are currently monitoring nonattainment. The Court found that EPA’s approach in CAIR was identical to its approach in the NOx SIP call and that EPA’s approach was reasonable. It denied North Carolina’s petition on this issue. As such, LADCO recommends that EPA continue to use a modeled plus monitored test to identify areas of interest. However, the test will need to deal with both areas not meeting and those struggling to maintain the air quality standards. In particular, as instructed by the Court, the test will need to account for historic variability in air quality levels.

We considered two methods, which assume similar approaches for ‘significant contribution to nonattainment’ and ‘interference with maintenance’. In the first method, a statistical analysis of the year-to-year variability in meteorology was conducted using the method developed by Cox and Chu (1993). Under this method, a threshold value slightly below the NAAQS could be used to address maintenance.

A second method to address maintenance uses the year-to-year variability already reflected in the ambient measurements. Under this method, areas of interest would be identified based on the monitoring data for the **highest** of the last three 3-year periods and the future year modeled values (based on the **highest** of the three 3-year periods included in the modeled attainment test, rather than the average of these three periods, which is what EPA's modeling guidelines currently recommend). An area would be on the list if the monitored and modeled values both exceed the NAAQS. Key advantages of this method are that it accounts for historic variability based on actual monitoring data, and it uses the NAAQS as the threshold. For these reasons, we recommend this approach be used.

Identifying Upwind States that Significantly Contribute to Nonattainment or Interfere with Maintenance

LADCO Recommendation:

A. An upwind state significantly contributes to nonattainment or interferes with maintenance in a downwind area of interest if its total impact from all source sectors equals or exceeds 1% of the applicable NAAQS.

B. Individual state contributions should be determined through a weight-of-evidence approach, including source apportionment modeling

C. Use of 1% of the NAAQS as the significance threshold is consistent with EPA's approach in CAIR.

Discussion: In the NOx SIP Call, EPA assumed a significance threshold for ozone of 2 ppb, which represented about 1.5% of the 1-hour ozone standard and 2.5% of the 8-hour standard (1997 version). In the Clean Air Interstate Rule (CAIR), EPA relied on this same threshold for ozone and assumed a significance threshold for PM2.5 initially based on 1% of the 15 ug/m3 annual standard. EPA subsequently rounded this value to 0.2 ug/m3, which is 1.3% of the NAAQS.

EPA was challenged by the State of North Carolina on its significance threshold for PM2.5, including its rounding to 0.2 ug/m3. The Court found that EPA's approach was reasonable and denied North Carolina's petition on this issue. As such, LADCO recommends that EPA continue to rely on significance values consistent with its prior rulemakings. Given that the ozone and PM2.5 standards have changed since these rulemakings, a reasonable approach would be to assume a specific percentage of the NAAQS as the significance threshold. Taken as a whole, the prior rulemakings suggest a value on the order of 1 – 1.5% of the NAAQS. For simplicity, we recommend a value of 1% of the NAAQS for a state to be deemed significant and included in the applicability of a CAIR replacement rule.

Implementing a Multi-Sector Remedy to Meet Clean Air Act Requirements

LADCO Recommendation:

A two-part process is recommended consisting of: (A) a national/regional control program adopted by EPA for electrical generating units (EGUs) and additional federal control measures for other sectors, and (B) state-led efforts to develop, adopt, and implement federally enforceable plans for each area of interest that is not expected to attain the standards even after implementation of the national/regional program.

A. National/Regional Control Program

A significantly contributing state (i.e., a state which contributes at least 1% to a downwind area of interest) must comply with the national/regional control program described below.

1. EGU point source strategy (applicable to units ≥ 25 MW)

   In adopting a CAIR replacement rule, EPA should:

   (a) make federally enforceable through appropriate mechanisms all NOx and SO_2 controls to comply with the original CAIR Phase I program;

   (b) make federally enforceable through appropriate mechanisms optimization by no later than early 2014 of existing NOx and SO_2 controls;

   (c) make federally enforceable through appropriate mechanisms application by 2015 of low capital cost NOx controls;

   (d) establish statewide emission caps by no later than 2017 for all fossil fuel-fired units ≥25MW. The caps should reflect an analysis of NOx and SO_2 controls on coal-fired units ≥ 100 MW which, in combination with the three measures above, will achieve rates that are not expected to exceed 0.25 lb/MMBTU for SO_2 (annual average for all units ≥25 MW) and 0.11 lb/MMBTU for NOx (ozone seasonal and annual average for all units ≥25 MW) and which will result in lower rates in some states. Previously banked emissions under the Title IV or CAIR programs shall not be used to comply with the state-wide emission caps; and

   (e) to the fullest extent allowed under the Clean Air Act, EPA should work with the states to establish regional emissions caps with full emissions trading to replace the caps currently applicable under CAIR.

   We believe that regional emissions caps for any earlier year (e.g., 2015) should not be established, either in addition to or in lieu of a 2017 cap. We conducted a state-by-state analysis of what level of EGU control for NOx and SO2 is achievable over the next several years. A fundamental assumption in our analysis is a July 2012 start date for the planning, engineering, and construction of any new NOx and SO2 controls. This date reflects a January 2011 promulgation date for a CAIR replacement rule and another 18 months for adoption of state rules. Four “layers” of

control were considered: (1) all NOx and SO2 controls to comply with the original CAIR Phase I program, (2) optimization of existing NOx and SO2 controls by 2014, (3) application of low capital cost NOx controls (e.g., combustion modifications) by 2015, and (4) installation of new NOx and SO2 controls (e.g., SCRs for NOx and FGDs for SO2) by 2017. We believe that the first three measures identified above are all that can be done by 2015.

We understand that EPA is considering a hybrid approach in its CAIR replacement rule involving regional emissions trading and unit-specific performance standards (cite: July 9, 2009, testimony by Regina McCarthy before the Subcommittee on Clean Air and Nuclear Safety, Committee on Environment and Public Works, U.S. Senate). As noted above, we strongly support and encourage EPA to include regional emissions trading to the fullest extent allowed under the Clean Air Act.

We believe, however, that unit-specific performance standards go beyond the requirements of section 110 and the scope of a CAIR replacement rule; inhibit trading; and that performance standards with a near-term compliance timeframe, such as 2017, are not practical for all EGUs. Although we firmly believe that is not appropriate to include performance standards in a CAIR replacement rule, if EPA decides to consider including performance standards, then EPA should work with the states to take into account the basis and timing of the requirements identified above, cost effectiveness, site specific factors (such as space limitations) and the pollution control equipment already in place on the existing fleet of EGUs. Specifically, on this last point, we believe that EPA should not require replacement or repowering of units or control systems that are sound technology and operating at a reasonable effectiveness.

2. Non-EGU point source strategy

   a. EPA should identify and prioritize other categories of point sources with major emissions of NOx and/or SO_2 (e.g., cement plants) based on a review of available emissions inventories and other information, such as source apportionment studies.

   b. For the non-EGU point sources, EPA should identify and evaluate control options for reducing NOx and/or SO_2 emissions. The evaluation should consider the technological, engineering, and economic feasibility of each control option.

   c. At a minimum, EPA should evaluate the technological, engineering, and implementation feasibility, and cost-effectiveness of controlling SO_2 and NOx emissions from industrial, commercial, and institutional boilers $\geq$ 100 MMBTU/hour.

3. Mobile source strategy, such as new engine standards for on-highway and off-highway vehicles and equipment, and a single consistent environmentally-sensitive formulated fuel.

4. Area source strategy, such as new federal standards for consumer products and architectural, industrial and maintenance coatings as originally promised by EPA in 2007.

B. State- Led Attainment Planning

We recommend the use of a state-led attainment planning process concurrent with developing the transport SIP to address areas of interest that are not expected to attain after implementation of the national/regional control program. The advantages of this state-led planning effort include:

- A one-size-fits-all federal solution cannot provide the most appropriate and cost-effective solution for each area;
- Attainment planning is more effective and more likely to succeed if it is done on a non-attainment area basis with a key subset of contributing states;
- Additional controls are identified where they are needed; and
- States maintain their responsibility under the Clean Air Act to establish state implementation plans.

A major contributing state (i.e., a state which contributes at least 4% to a downwind area of interest that is not expected to attain after implementation of the national/regional program) must also either:

1. In conjunction with other major contributing states, develop, adopt, and implement an appropriate attainment strategy for the area of interest, as follows:

    a. An upwind state's responsibility for achieving air quality benefits in a downwind area should be commensurate with the magnitude of the upwind state's contribution to the downwind air quality problem.
    b. To facilitate flexibility in developing control programs and reduce control costs, state planning efforts should accommodate interstate emissions trading to the fullest extent allowed by the Clean Air Act.
    c. Photochemical modeling, performed in accordance with EPA modeling guidance, should be conducted to determine the amount of emission reduction needed to provide for attainment and the relative contributions of the participating states and source sectors, and to assess candidate control measures.

2. In the event that the multi-state planning effort is unsuccessful, then each 4% state may still be able to satisfy its section 110(a)(2)(D) obligation if it can demonstrate to EPA that it has emission reductions measures for significantly contributing source categories that are commensurate with a Reasonably Available Control Measure analysis for the affected area. These measures should be determined by first identifying key pollutants and source categories that contribute to the air quality problem, and then identifying and evaluating control measures for the contributing source categories.

Discussion: A 2-part, multi-sector process is recommended consisting of: (1) a national/regional control program adopted by EPA for EGUs and additional federal control measures for other sectors, and (2) state-led efforts to develop, adopt, and implement appropriate attainment plans for each nonattainment and maintenance area of interest.

Regional air quality modeling conducted by the State Collaborative demonstrates the need for a multi-sector approach ("Regional Modeling for the Eastern U.S.: Technical Support Document", July 9, 2009). This modeling shows for ozone, mobile sources (on-road and off-road) are the dominant contributors (about 60%), and for PM2.5, point, area, and mobile sources are all important contributors – see Figure 1. Thus, a complete remedy to section 110(a)(2)(D) must deal with EGUs **and other important source sectors**.

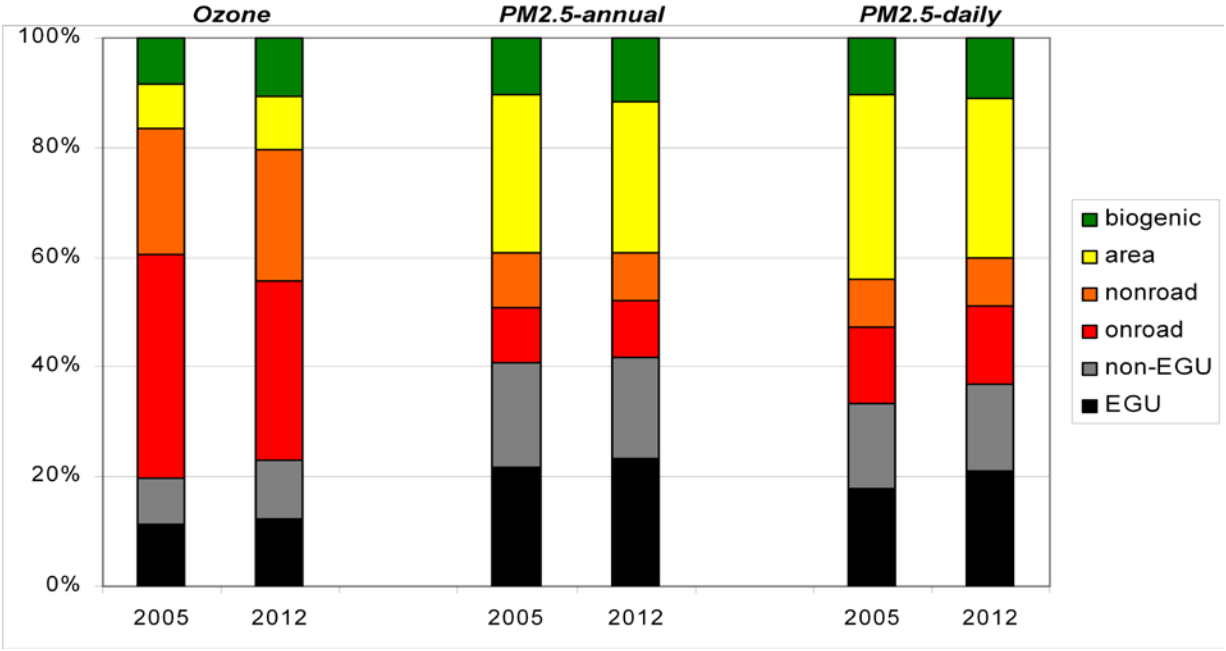

Figure 1. Source sector contributions for ozone PM2.5-annual, and PM2.5-daily based on 20-30 select (high concentration) monitors

National/Regional Control Program: A key part of the recommended national/regional control program covers EGUs, which, as seen in Figure 2, contribute about 10% (on average) for ozone and 20% (on average) for PM2.5. The LADCO States examined the level of EGU control for NOx and SO2 that is achievable over the next several years – see, for example, Attachment I. A fundamental assumption in the LADCO analysis is a **July 2012** start date for the planning, engineering, and construction of any new NOx and SO2 controls. This date reflects a January 2011 promulgation date for a CAIR replacement rule and another 18 months for adoption of state rules.

Achievable state-wide average NOx and SO2 emission rates (annual average) were determined for four future years: 2013, 2014, 2015, and 2017.

Four "layers" of control were considered on a plant-by-plant basis:

1. Current "in the pipeline" controls pursuant to CAIR Phase I; state rules; state permits; or Consent Decrees

2. By 2014, optimization of existing NOx and SO2 controls to achieve 90% (SCRs) and 95% or more (FGDs) reduction, respectively

3. By 2015, application of low capital cost NOx controls (e.g., combustion modifications)

4. By 2017, installation of new NOx and SO2 controls (e.g., SCRs for NOx and FGDs for SO2) on units $\geq$ 100 MW to support state-wide average emissions rates

Based on this plant-level, unit-level analysis of coal-fired units, the LADCO States identified the following achievable annual average emission rates:

Table 1. Results of LADCO analysis of achievable emission rates (lb/MMBTU)

NOx					
Year	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**
2008	0.23	0.305	0.29	0.36	0.21
2013	0.11-0.12	0.297	0.18	0.24	0.13
2014	0.11-0.12	0.171	0.15	0.18	0.12
2015	0.11-0.12	0.165	0.13	0.17	0.10
2017	0.11-0.12	0.114	0.11	0.12	0.09
SO2					
Year	**Illinois**	**Indiana**	Michigan	**Ohio**	**Wisconsin**
2008	0.50	0.93	0.91	1.09	0.57
2013	0.24-0.44	0.67	0.58	0.75	0.39
2014	0.20-0.43	0.66	0.45	0.65	0.39
2015	0.19-0.28	0.66	0.37	0.65	0.25
2017	0.15-0.23	0.25	0.25	0.256	0.16

It should be noted that the analysis is based on coal-fired units. Consideration of all units (coal, oil, gas, and biomass) will result in emission rates slightly below those indicated above. The number of post-combustion controls assumed in this analysis is provided in Table 2. The total amount of mega-wattage controlled in each state is on the order of 80-90%.

Table 2. Number of controls assumed in LADCO analysis of achievable emission rates

	NOx																SO2				
	SCR					SNCR					ALL						FGD				
	IL	IN	MI	OH	WI	IL	IN	MI	OH	WI	IL	IN	MI	OH	WI		IL	IN	MI	OH	WI
2008		23	3	19	1		4	0	15	1	17	27	3	34	2		6	23	2	16	1
2013		23	7	25	5		7	0	11	8	32	30	7	36	13		20	29	7	25	6
2014		23	12	26	5		7	0	11	8	34	30	12	37	13		29	29	12	33	6
2015		23	17	27	5		17	0	11	15	36	40	17	38	20		35	29	17	33	6
2017		32	25	34	8		17	0	14	15	36	49	27	48	23		37	48	27	56	13

Note: IL and OH numbers reflect number of units controlled, and IN and WI numbers reflect number of installations (which may cover multiple units)

Based on the above analysis, the LADCO States recommend the federal control program for EGUs reflect the state-wide average emission rates not to exceed 0.25 lb/MMBTU for SO2 (annual average) and 0.11 lb/MMBTU for NOx (ozone seasonal average).

To supplement the regional air quality modeling conducted by the State Collaborative (see "Regional Modeling for the Eastern U.S.: Technical Support Document", July 9, 2009), LADCO conducted modeling for two additional EGU control scenarios[1]:

	NOx (lb/MMBTU)	SO2 (lb/MMBTU)
Scenario E (2018)	0.125	0.25
Scenario E2 (2018)	0.11	0.25

The average improvement in air quality concentrations for the EGU scenarios (for 2018) is as follows:

Table 3. Domainwide average change in air quality concentrations between EGU scenarios

	PM-annual		PM-daily		Ozone	
	C v. E	C v. E2	C v. E	C v. E2	C v. E	C v. E2
NE	0.7	0.8	1.2	1.2	1.6	2.0
MW	1.1	1.1	1.3	1.4	1.8	1.8
SE	0.9	0.9	1.1	1.1	2.0	2.2
Domain	0.9	0.9	1.1	1.1	1.7	1.8

[1] The base control scenario, which reflects all existing ("on the books") controls (including all legally enforceable EGU controls and all planned EGU controls pursuant to CAIR, as identified by EPA), is referred to as Scenario C.

The amount of improvement varies spatially, as shown in Figure 2. Based on these results, two key findings should be noted:

- Scenario E2, which is consistent with the LADCO proposal for EGUs in the national/regional strategy, provides considerable air quality benefit.

- Scenario E2 provides similar air quality benefit compared to other EGU control strategies considered in the regional air quality modeling.

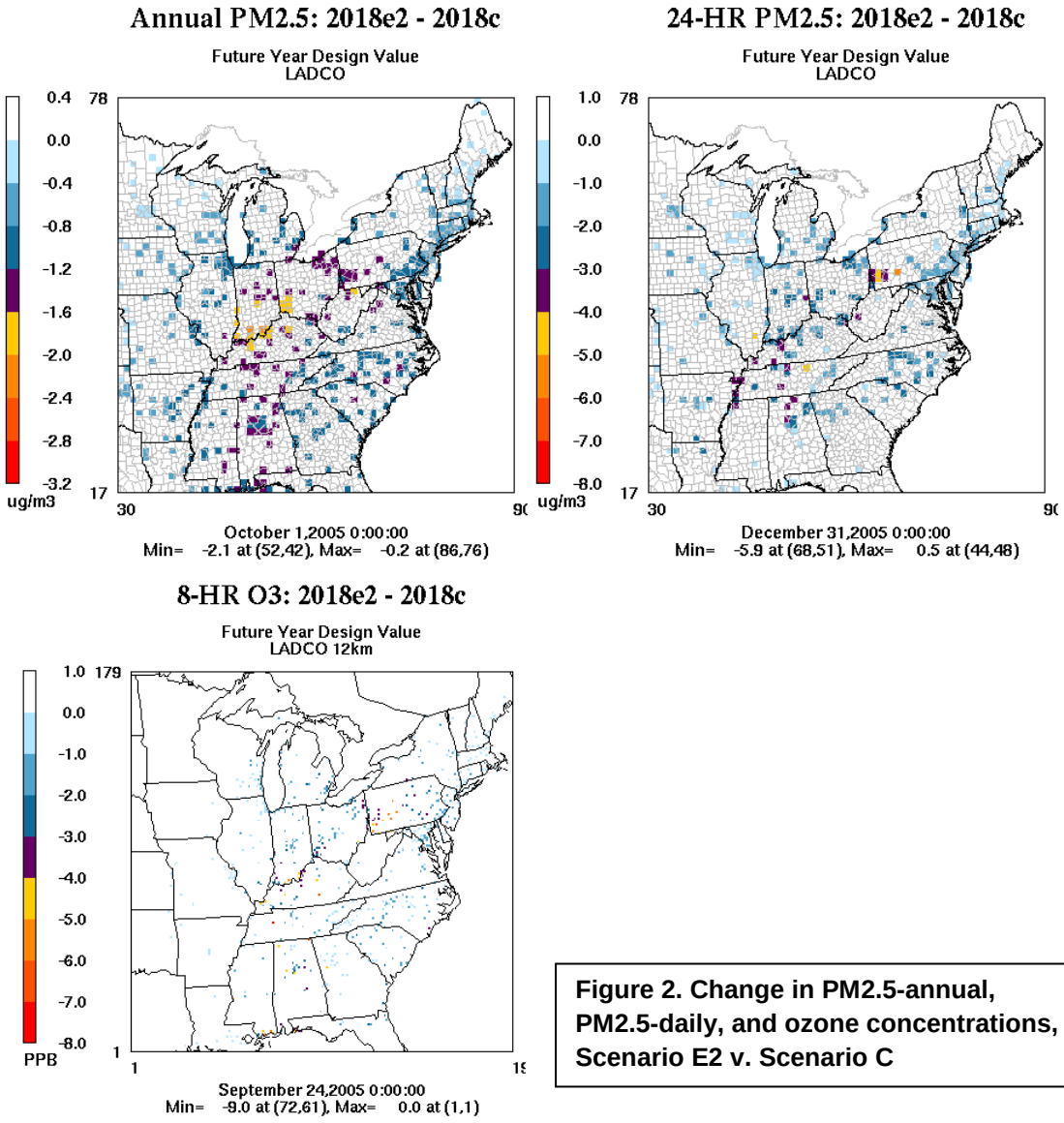

Figure 2. Change in PM2.5-annual, PM2.5-daily, and ozone concentrations, Scenario E2 v. Scenario C

State-led Planning: A major contributing state (i.e., a state which contributes at least 4% to a downwind area of interest) must, in conjunction with other major contributing states, develop, adopt, and implement an appropriate attainment strategy for the area of interest. The selection of 4% or more as the definition of a major contributing state was based on available contribution information, which showed: (1) a 4% threshold is sufficient to capture most of the total impact at key monitoring sites in eastern nonattainment areas, and (2) a 4% threshold results in a manageable number of states, which is important for a successful planning process, yet includes the necessary states specific to each residual nonattainment area. These focused, manageable state-led planning efforts will produce air quality benefits farther downwind as well, assisting farther downwind nonattainment areas in achieving the NAAQS. Specific justification is summarized below.

The regional air quality modeling conducted by the State Collaborative was reviewed to determine state and source region contributions. From a regional perspective, the home region is the dominant contributor – see Figure 3. From an individual state perspective, states with a 4% or more contribution make-up a large portion (70-80%) of the total concentration in the areas of interest – see Table 4.

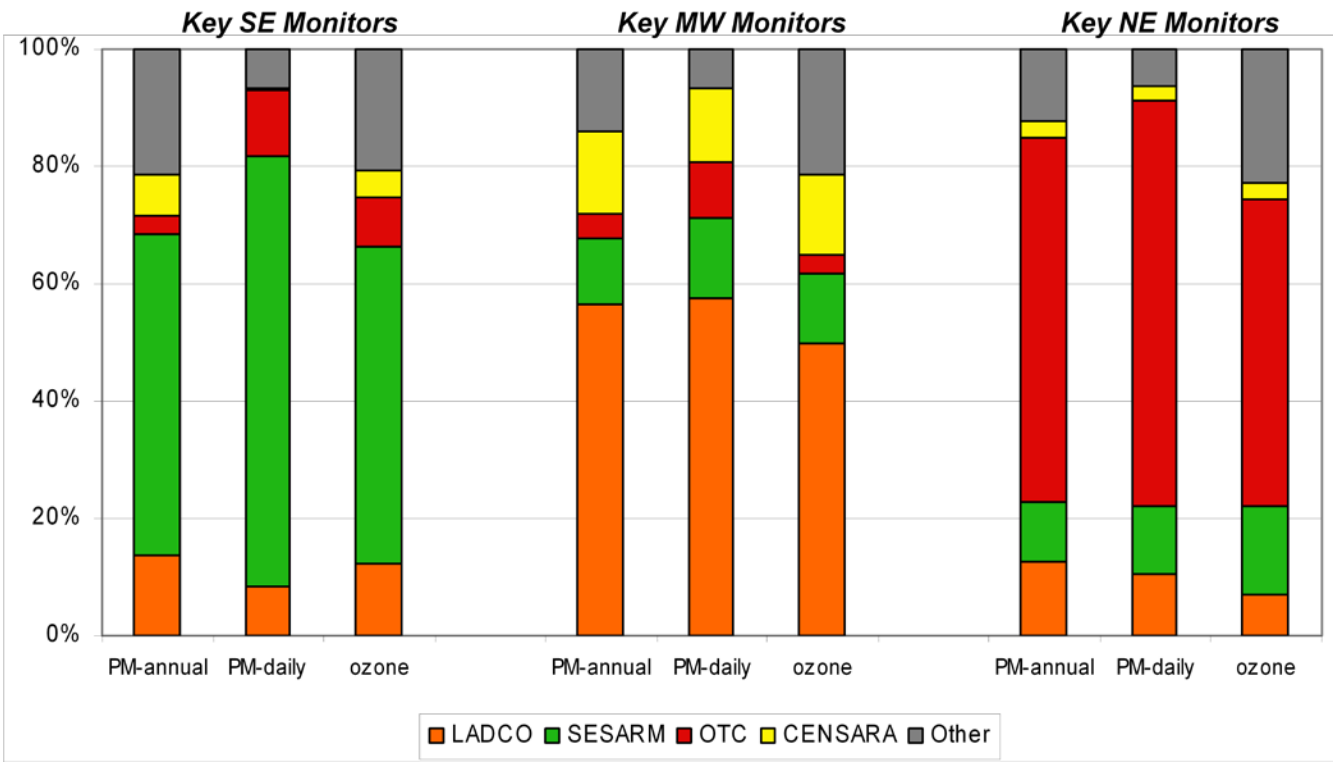

Figure 3. Source region contributions for ozone PM2.5-annual, and PM2.5-daily based on 20-30 select (high concentration) monitors

Table 4. Average (%) state-level contributions for 20-30 select monitors

	In-State	Out-State		Total						Out-of-state Contribution				
				1%	2%	3%	4%	5%		1%	2%	3%	4%	5%
PM2.5-Annual														
2005	40	60		94	86	77	71	67		89	75	58	50	42
2012	43	57		94	85	77	72	68		89	72	58	49	42
PM2.5-Daily														
2005	38	62		95	89	83	78	75		91	82	71	63	57
2012	43	57		95	90	83	78	74		91	81	70	60	52
Ozone														
2005	25	75		93	83	76	69	64		90	77	66	57	50
2012	26	74		92	84	78	71	66		93	78	68	59	52

Additional information on which states are important contributors to nonattainment problems is available from analyses of measurement data:

- Back trajectory analyses were generated by LADCO based on 2003 ozone air quality data for select locations in the eastern half of the U.S. Example results are presented in Figure 4. These contour plots are based on 72-hour, concentration-weighted back trajectories for a 500 m release height and noon start time. Upwind areas most associated with higher concentrations reflect darker red shading. Consistent with the modeling, higher concentrations are associated with the home states and nearby neighboring states (e.g., for Chicago, important upwind areas include IL, IN, and MO; and for Baltimore, MD, PA, VA, WV, and OH). Note, the plots are meant to be more qualitative than quantitative, and should not be over-analyzed to yield individual state contributions.

- Maryland Department of Environment recently presented a conceptual model of ozone formation and transport in the Northeast (Maryland Department of the Environment, 2009, and NESCAUM, 2006). The conceptual model identifies multiple transport features, including long-range transport (from sources to the south and west of the OTR), regional-scale transport within the OTR from channeled flows in nocturnal low-level jets, and local-scale transport along coastal shores due to sea and lake breezes. Evidence of an aloft ozone reservoir is based on aloft aircraft measurements and higher altitude monitoring sites. An educated estimated of the relative impacts for Baltimore suggests 30-40% from westerly transport, 10-20% from southerly nocturnal low-level jets, 10-20% from city-to-city local transport, and 10-20% local. These estimates generally agree with the regional modeling-based source apportionment, which ascribes 30-40% from states to the west (mostly, VA, WV, and PA), 20-30% from MD, 5-10% from states to the south, and 20% from background.

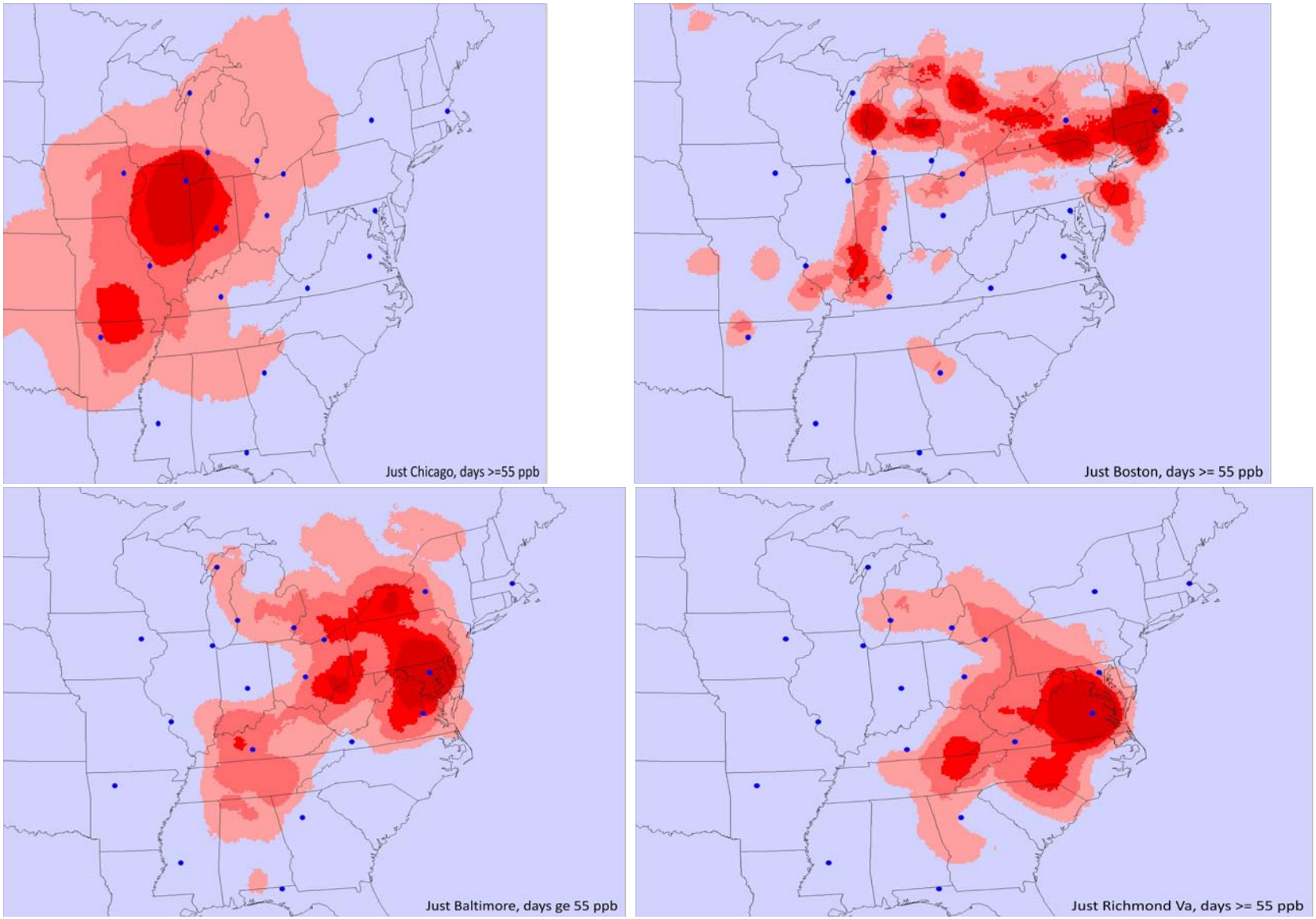

Figure 4. Contour plots of back trajectories for high concentration days for Chicago (upper left), Boston (upper right, Baltimore (lower left), and Richmond (lower right)

Note: the plots are meant to be more qualitative than quantitative and do not reflect specific individual state contributions.

- Preliminary analysis of aircraft data during the August 2003 blackout period in the Northeast was conducted by the University of Maryland (Marufu, et al, 2004). Comparison of aircraft spirals over central PA on August 15, 2003 and August 4, 2002 indicate aloft ozone about 50% lower and surface ozone about 38 ppb lower. The limited nature of this analysis (e.g., comparison of only two days) suggests the need for a more rigorous analysis. LADCO intends to examine further this event by conducting ambient data analyses (e.g., back trajectories) and applying a regional air quality model. Source apportionment methods (trajectory-based and model-based) will be used to determine the relative source sector contributions. The results of this analysis will be provided to EPA later this year. We believe this analysis will provide useful information on the effect of a large reduction in EGU emissions on air quality concentrations, and on the model's ability to simulate transport in the eastern U.S.

- Over a period from 1987 to 2003, LADCO sponsored the collection of aloft (aircraft) data for ozone, ozone precursors, and PM chemical species (2002-2003 only). An overview of the data, along with limited analyses, is presented in "Data Processing and Analysis of Aloft Air Quality Data Collected in the Upper Midwest", prepared for LADCO by Sonoma Technology, Inc.., August 5, 2004. Based on a case study analysis of the August 13-20, 2003, period, which included the blackout event noted above, key findings included: (1) background ozone levels (i.e., air entering the LADCO region) were usually about 60-70 ppb, (2) these background levels were lower than those observed in the 1991 LMOS field program when boundary conditions were about 70-100 ppb during episodes, and (3) local contributions were generally on the order of 20-40 ppb (and as high as 60 ppb). Furthermore the report stated that "it is not clear from this analysis whether the shutdown of power plants had any influence on air quality in the Midwest."

The regional air quality modeling conducted by the State Collaborative was also reviewed to determine which states contribute at different threshold levels – 1%, 2%, 3%, 4%, and 5% of the NAAQS. Tables 5 – 7 summarize the states which contribute to the areas of interest for PM2.5-annual, PM2.5-daily, and ozone. (Note, Table 8 includes a representative set of ozone areas of interest relative to the 75 ppb NAAQS.) The tables show that the number of 4% or more states is generally on the order of 3-4, while the number 1% or more states is 10-15. This shows that a threshold on the order of 4% will provide for a manageable number of states, which is important for a successful planning effort.

Table 5. Areas of interest and contributing states (at different thresholds) for PM2.5-annual

	>0.15 ug/m3	>0.30	>0.45	>0.60	>0.75
Southeast					
* Atlanta, GA	IN, OH, AL, GA. SC, NC, TN, KY	AL, GA, SC, TN	AL, GA	GA	GA
* Macon, GA (M)	IN, OH, AL, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC	GA	GA	GA
Midwest					
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WV, PA, CAN	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Detroit, MI	IL, IN, MI, OH, WI, IA, MN, MO, KY, WV, PA, NY, CAN	IL, IN, MI, OH, WI, PA, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN	MI, OH, CAN
* Granite City, IL	IL, IN, OH, MI, WI, IA, MN, MO, TN, KY	IL, IN, MI, IA, MO	IL, IN, MO	IL, MO	IL, MO
* Cincinnati, OH (M)	IL, IN, MI, OH, WI, IA, MO, TN, KY, WV, PA, CAN	IL, IN, MI, OH, KY	IL, IN, MI, OH, KY	IN,OH, KY	IN, OH, KY
* Chicago, IL (M)	IL, IN, MI. OH, WI, IA, MN, MO, KY, CAN	IL, IN, MI, OH, WI, IA, MO	IL, IN, MI, WI	IL, IN, MI, WI	IL, IN, MI, WI
* Indianapolis, IN (M)	IL, IN, MI. OH, WI, IA, MN, MO, TN, WV, PA, KY, CAN	IL, IN, MI, OH, WI, MO, KY	IL, IN, MI, OH, KY	IL, IN, MI, OH, KY	IL, IN, OH
Northeast					
* Liberty-Clairton, PA	IL, IN, MI, OH, WI, KY, WV, VA, PA, NY,CAN	IN, OH, MI, KY, WV, PA, CAN	MI, OH, WV, PA	OH, WV, PA	OH, WV, PA
* New York, NY	OH, MI, VA, MD, PA, NY, NJ, CT/RI, MA, CAN	PA, NY, NJ, CAN	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

Table 6. Areas of interest and contributing states (at different thresholds) for PM2.5-daily

	>0.35 ug/m3	>0.75	>1.05	>1.5	>1.75
Southeast					
* Birmingham, AL (M)	IN, OH, GA, SC, NC, TN, KY, VA, WV, PA, NY	IN, OH, GA, TN, KY, VA, WV, PA	OH, GA, TN, KY, WV, PA	OH, GA, TN, KY, WV, PA	OH, GA, KY, WV, PA
Midwest					
* Chicago, IL	IL, IN, MI. OH, WI, IA, MO, KY, PA, CAN	IL, IN, MI, OH, WI, IA, MO, KY	IL, IN, MI, OH, WI, MO	IL, IN, MI	IL, IN, MI
* Cleveland, OH	IL, IN, MI, OH, WI, KY, WV, PA, NY, CAN	IN, MI, OH, PA, NY, CAN	IN, MI, OH, PA, CAN	MI, OH, PA, CAN	MI, OH, PA, CAN
* Detroit, MI	IL, IN, MI. OH, WI, IA, MO,TN, KY, WV, PA, NY, CAN	IL, IN, MI, OH, KY, PA, CAN	IL, IN, MI, OH, KY, CAN	IL, IN, MI, OH, CAN	IN, MI, OH, CAN
* Milwaukee, WI	IL, IN, MI, OH, WI, IA, MN, MO, KY, CAN	IL, IN, MI, WI, IA, MN, MO	IL, IN, MI, WI	IL, IN, MI, WI	IL, WI
* Green Bay, WI	IL, IN, MI, OH, WI, IA, MN, MO, KY, CAN	IL, IN, MI, WI, IA, MN, MO	IL, IN, MI, WI, IA, MN, MO	IL, MI, WI, IA	IL, MI, WI, IA
* Granite City, IL (M)	IL, IN, OH, MI. WI, IA, MN, ND, MO, PA, CAN	IL, IN, OH, MI, WI, IA, MN, MO	IL, IN, OH, MI, IA, MO	IL, MO	IL, MO
* Muscatine, IA (M)	IL, IN, OH, MI, WI, IA, MN, ND. WV. PA, CAN	IL, IN, MI, OH, WI, IA, MN, MO	IL, IN, MI, WI, IA, MN, MO	IL, IN, MI, WI, IA, MN	IL, IN, MI, WI, IA, MN
Northeast					
* Baltimore, MD	IN, OH, NC, VA, WV, MD, DE, PA, NY, NJ, KY, CT/RI, MA, CAN	OH, VA, WV, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	VA, MD, PA, NY	VA, MD, PA
* Lancaster, PA	IN, MI, OH, NC, VA, WV, MD, DE, PA, NY, NJ, CT/RI, MA, CAN	OH, VA, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	VA, MD, PA, NY, NJ	MD, PA, NY
* Liberty-Clairton, PA	IL, IN, MI, OH, KY, WV, PA, NY, VA, MD, CAN	IN, MI, OH, KY, WV, PA, NY	OH, KY, WV, PA	OH, WV, PA	OH, WV, PA
* New York, NY	IN, MI, OH, VA, WV, MD, PA, NY, NJ, MA, CT/RI, DE, NC, CAN	OH, VA, MD, PA, NY, NJ, MA, CT/RI	PA, NY, NJ	PA, NY, NJ	PA, NY, NJ

Table 7. Areas of interest and contributing states (at different thresholds) for ozone

	>0.85 ppb	>1.70	>2.55	>3.40	>4.25
Southeast					
* Atlanta, GA	AL, MS, GA, FL, SC, NC, TN, KY, VA	AL, GA, SC, NC, TN	AL, GA, SC, TN	AL, GA	AL, GA
* Charlotte, NC	IN, OH, AL, GA, SC, NC, TN, KY, VA. WV	SC, NC, TN, KY, VA	SC, NC, TN, VA	SC, NC, TN, VA	SC, NC
Midwest					
* Chicago, IL (Kenosha, WI)	IL, IN, OH, MI, WI, MO, KY, WV, CAN	IL, IN, MI, OH, WI, MO, KY, CAN	IL, IN, MI, OH, WI, MO, KY	IL, IN, MI, WI, MO	IL, IN
* Holland, MI	IL, IN, OH, MI, WI, IA, MO, TN, KY, PA, CAN	IL, IN, OH, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, WI, MO	IL, IN, MI, MO
* St. Louis, MO	IL, IN, OH, MI, MO, MS, KY, TN, IA	IL, IN, OH, MO, TN, KY	IL, IN, MO, KY	IL, IN, MO	IL, MO
* Cleveland, OH	IL, IN, OH, MI, MO, TN, KY, VA, WV, PA, NY, CAN	IL, IN, OH, MI, KY, PA, CAN	IL, IN, OH, MI, KY, PA, CAN	IN, OH, MI, KY, PA, CAN	IN, OH, MI, PA
* Cincinnati, OH (Campbell, KY)	IL, IN, MI, OH, MO, TN, KY WV, PA, CAN	IL, IN, OH, MO, TN, KY	IL, IN, OH, TN, KY	OH, KY	OH, KY
* Sheboygan, WI	IL, IN, OH, MI, WI, MO, TN, KY, VA, WV, PA, CAN	IL, IN, OH MI, WI, MO, KY	IL, IN, OH, MI, WI, MO, KY	IL, IN, MI, WI	IL, IN, WI
Northeast					
* Washington, DC	IN, OH, MI, NC, KY, VA, WV, MD, PA, NJ, NY, CAN	OH, NC, VA, WV, MD, PA, NY	OH, VA, WV, MD, PA	OH, VA, MD, PA	VA, MD, PA
* Baltimore, MD	IN, OH, MI, NC, TN, KY, VA, WWV, MO, PA, NJ, NY, CAN	OH, KY, VA, WV, MD, PA, NY	OH, VA, WV, MD, PA	VA, WV, MD, PA	VA, MD, PA
* Philadelphia, PA	IL, IN, OH, MI, NC, KY, VA, WV, MD, DE, PA, NJ, NY, CAN	OH, VA, MD, WV, PA, NJ, NY, CAN	MD, DE, PA, NJ, NY	NY, PA, NJ	NY, PA, NJ
* Springfield, MA	OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, MA, CAN	MD, VA, PA, NJ, NY, CT/RI, MA	VA, PA, NJ, NY, CT/RI, MA	PA, NJ, NY, CT/RI, MA
* Greater Connecticut	OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, MA, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, NC, PA, NJ, NY, CT/RI	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI
* New York, NY (Danbury, CT)	IN, OH, NC, KY, VA, WV, MD, PA, NJ, NY, CT/RI, CAN	OH, NC, VA, MD, PA, NJ, NY, CT/RI, CAN	VA, PA, NJ, NY, CT/RI	VA, PA, NJ, NY, CT/RI	PA, NJ, NY, CT/RI

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Attachment I

State-Level Analysis of Achievable EGU Emission Rates in the LADCO Region

Illinois – see State of Illinois' Multi-Pollutant Standard/Combined Pollutant Standard (Illinois Mercury Rule, 35 Ill. Adm. Code Part 225)

Indiana – copy attached

Michigan

Ohio – copy attached

Wisconsin – copy attached

Indiana Analysis

SO2

1. Incorporated changes/controls that occurred or are projected to occur between the baseline year and the year 2013. Due to the timing of the controls that were installed between the years 2005 and the year 2008, 2005 was chosen the base year for analysis to capture the effect of controls installed. One power plant is projected to switch to IGCC and three coal-fired units are projected to shutdown. During this time, interval scrubbers were installed on several units and the scrubbers on several units were upgraded. Several more controls are projected to be installed.

2. By the year 2015, several pre-2005 with reported efficiencies less than 95% were assumed to be upgraded to 95%.

3. By the year 2017, new scrubbers were installed on units in order of their capacities and emissions. Units >100 MW were considered for installation and an efficiency equal to 95% or a floor rate equal to 0.06 lb/MMBtu was assumed. The projected emission rates are given below:

Year	Emission rate (lb/MMBtu)
2005	1.31
2006	1.27
2007	1.08
2008	0.93
2013	0.67
2015	0.68
2017	0.25

NOx

1. Incorporated changes/controls that occurred or are projected to occur between the baseline year and the year 2013. The year 2008 was chosen as the base year for analysis. One power plant is projected to switch to IGCC and three coal-fired units are projected to shutdown. SNCRs are projected to be installed on three units.

2. In the year 2014, existing post-combustion controls were assumed to begin year round operation. Emission rates equal to 0.25 lb/MMBtu for SNCRs and 0.06 lb/MMBtu were assumed.

3. In the year 2015, low capital cost controls were applied. SNCRs were considered for units <200 MW at an efficiency equal to 35% or at a floor rate equal to 0.25 lb/MMBtu. Controls were installed on units in order of their capacities and emissions.

4. In the year 2017, SCRs on units >200 MW at a control efficiency equal to 90% or at a floor emission rate equal to 0.06 lb/MMBtu were applied. Controls were installed on units in order of their capacities and emissions. The projected emissions are given below:

Year	Emission rate (lb/MMBtu)
2008	0.305
2013	0.297
2014	0.171
2015	0.165
2017	0.114

Ohio Analysis[2]

SO2

- Incorporated reductions in rates based upon in the pipes controls that are locked in by the companies based on company provided schedule.
    - If consent decree required retire, retrofit or repower in the future we assumed a retrofit level of control would be applied.
- Incorporated additional control requirements for units where the company has not indicated future control:
    - Required scrubbers installed by 2017.
    - Required optimization by 2014 if it was to meet 95% or by 2017 if it was to achieve greater than 95% efficiency based on 2008 base year.
- Required continuous operation for all controls upon installation or by 2015-2017 (assessed on unit-by-unit basis).
- Applied rates of 0.20 for scrubbers which would equate to approximately 97+% control for higher sulfur coals or 95% control for blends.
    - This rate was still applied to sources currently controlled whose baseline rates were below 0.20 in 2008 to provide a safety margin so that coal use would not be limited.
    - This rate was also applied to sources currently controlled whose baseline rates were above 0.20 in 2008 but we had reason to believe optimization is realistic. See next bullet for exception.
- Applied rates of 0.25 to known high sulfur units based upon factors such as: company indications of continuing to use high sulfur coals, recently installed scrubbers, company indications of 95% efficiencies during 2007 and 2008, etc.
- Applied rates of 0.30 to two small units currently controlled (120 MW each) with known higher rates.
- Did not require control on the following units based upon size and fuel use characteristics. However, required these sources to maintain use of lower S coal/blends or begin use of lower S coal/blends. This was a unit-by-unit analysis of 2008 base year rates, S content used and company indications of future coal use:
    - Four units at 100 MW and below – no changes.

[2] This identifies the methodology that was used to arrive at interim and final 2017 rates. Use of terminology such as “required” does not imply these exact strategies and cutoffs will be used to implement said rates.

NOx

- Incorporated reductions in rates based upon in the pipes controls that are locked in by the companies based on company provided schedule.
    - If consent decree required retire, retrofit or repower in the future we assumed a retrofit level of control would be applied.
- Incorporated additional control requirements for units where the company has not indicated future control:
    - Required SCR or SNCR installed by 2017.
        - SCR required for sources roughly greater than 250 MW. Assumed a 0.08 rate could be achieved (assessed on unit-by-unit basis).
            - This rate was still applied to sources currently controlled whose baseline rates were below 0.08 in 2008 to provide a safety margin.
            - This rate was also applied to sources currently controlled whose baseline rates were above 0.09 in 2008 but we had reason to believe optimization is realistic.
            - This required some sources to upgrade from SNCR to SCR.
        - SNCR required for sources roughly between 130 and 250 MW. Assumed 50% reduction in rate over base year. Rates ranged from 0.11 to 0.25 (higher end rare).
- Required low NOx burners by 2015 for those missing regardless of size (assumed 30% reduction over base year).
- Required optimization by 2014 of existing controls where it appeared realistic (assessed on unit-by-unit basis).
- Required continuous operation for all controls upon installation or by 2015-2017 (assessed on unit-by-unit basis).
- Did not require SCR or SNCR on units roughly at 150 MW or below (assessed on unit-by-unit basis).

The following rates achieved applying the above, through the requested years, is outlined below:

NOx (annual/ozone)					
Year	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**
2008				0.36/0.19	
2013				0.24/0.17	
2014				0.18/0.16	
2015				0.17/0.16	
2017				0.12/0.115	
SO2					
Year	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**
2008				1.09	
2013				0.75	
2014				0.65	
2015				0.65	
2017				0.256	

The table below summarizes the number of controls assumed over time:

	2008			**2013**			**2014**			**2015**			**2017**		
	#	total MW controlled	% total MW	#	total MW controlled	% total MW	#	total MW controlled	% total MW	#	total MW controlled	% total MW	#	total MW controlled	% total MW
SCR	19	11274	51%	25	13751	63%	26	14422	66%	27	14731	67%	34	17173	78%
SNCR	15	4335	20%	11	2823	13%	11	2823	13%	11	2823	13%	14	2737	12%
FGD	16	10049	46%	25	12636	58%	33	15261	70%	33	15261	70%	56	20933	95%

Wisconsin Analysis

SOx (lbs/mmBtu)	2008	2013	2014	2015	2017	2017
	Existing	In Pipeline	Improve existing controls	Controls without major investment	With available FGD	High Control
State Average (approved CAs)	**0.57**	**0.39**	**0.39**	**0.25**	**0.16**	**0.16**
Large Utilities						
2013 Base (approved CAs)	0.23 - 0.93	0.12 - 0.77	0.12 - 0.77	0.12 - 0.77	0.12 - 0.26	0.12 - 0.26
2013 Base (w/ pending CAs)	0.26 - 0.77	0.12 - 0.59	0.12 - 0.59	0.12 - 0.43	0.06 - 0.16	0.03 - 0.07
Small Utilities						
2013 Base (approved CAs)	0.41 - 2.18	0.00 - 0.53	0.00 - 0.53	0.00 - 0.17	0.00 - 0.17	0.00 - 0.17

notes

1) Dry FGD (95% efficiency) control assumed for many utilities, due to small unit sizes at plant sites and/or timing constraints.

2) This is a "best case" analysis using FGD technology. Alternative controls - such as lime injection or substituting more low-sulfur coal - may be used in practice at some utilities in order to avoid deep controls, but still be below 0.25 #/MMBtu.

NOx (lbs/mmBtu)	2008	2013	2014	2015	2017	2017
	Existing	In Pipeline	Improve existing controls	Controls without major investment	With available SCR	High Control*
State Average (approved CAs)	**0.21**	**0.13**	**0.12**	**0.10**	**0.09**	**0.07**
Large Utilities						
2013 Base (approved CAs)	0.13 - 0.36	0.08 - 0.24	0.08 - 0.24	0.08 - 0.14	0.08 - 0.10	0.06 - 0.09
2013 Base (pending CAs) / Possible	0.13 - 0.36	0.08 - 0.15	0.07 - 0.15	0.07 - 0.13	0.07 - 0.09	0.05 - 0.06
Small Utilities	0.19 - 0.55	0.06 - 0.25	0.06 - 0.25	0.06 - 0.2	0.06 - 0.2	0.06 - 0.2

notes

1) "CA" - Certificate of Authorization
2) Controls without major investment include combustion modifications, LNBs, and SNCR
3) The 2015 control levels reflect the WeEnergies consent decree, NOx RACT, and approved CAs for major controls.
4) The schedule for installing SCRs is built around the schedule for installing dFGDs.
5) Accommodating an SCR installation in the needed timeframe may require altering the schedule for a major outage which occurs every 5 to 10 years. An SCR tie-in usually requires major outage as it impacts existing ductwork in typically restricted space as compared to dFGD.
6) The default control for SCR is 0.06 lbs/mmbtu to reflect average accounting for less efficient operation during winter to prevent ammonium sulfate buildup.
7) "*" - Reflects pushing SCR control to 90% control on a year-round basis
8) "Possible" - This case addresses a potentially accelerated schedule for SCR installations

The State of New Jersey
Department of Environmental Protection

Certification
For Meeting the Infrastructure Requirements in the Clean Air Act

for

35 µg/m^3 24-Hour (2006) Fine Particulate Matter National Ambient Air Quality Standard

Appendix E: New Jersey's Significant Contribution Analysis to Meet Section 110(a)(2)(D)(i)

January 2010

Appendix E: New Jersey's Significant Contribution Analysis to Meet Section 110(a)(2)(D)(i)

A. Interstate Transport of Air Pollution – 42 U.S.C. § 7410(a)(2)(D)(i) (Section 110(a)(2)(D))(i)

i. Section 110(a)(2)(D)(i)

42 U.S.C. § 7410(a)(2)(D) (Section 110(a)(2)(D)) requires states to include provisions prohibiting any source or other type of emissions activity in one state from:

1) Contributing significantly to nonattainment of the National Ambient Air Quality Standard (NAAQS) for areas in another state or interfere with the maintenance of the NAAQS in another state;
2) Interfere with measures required to meet the implementation plan for any other state related to Prevention of Significant Deterioration (PSD); or,
3) Interfere with measures required to meet the implementation plan for any other state related to Regional Haze and Visibility.

In order to address interstate pollution, New Jersey coordinates with the nearby states on regional control measures as part of planning organizations, such as the Ozone Transport Commission (OTC), Northeast States for Coordinated Air Use Management (NESCAUM), Mid-Atlantic/Northeast-Visibility Union (MANE-VU), and Mid-Atlantic Regional Air Management Association (MARAMA). New Jersey will continue to work regionally through these organizations.

To meet the interstate transport provisions for the 1997 8-hour ozone and the 1997 $PM_{2.5}$ NAAQS, the USEPA allowed the states to rely on the Clean Air Interstate Rule (CAIR).[1] The U.S. Court of Appeals determined the CAIR does not meet this obligation and remanded the rule back to the USEPA.[2] As the United States Environmental Protection Agency (USEPA) works to develop a replacement rule for the CAIR, the states in the eastern United States have been working together to develop recommendations to the USEPA regarding the replacement rule, including the issues of upwind transport and addressing Section 110(a)(2)(D)(i). This effort is commonly referred to as the 'State Collaborative' (materials produced from this effort are included in Appendix D). On September 2, 2009, 17 states within the Ozone Transport Commission and the Lake Michigan Area Directors Consortium (LADCO) submitted a letter (see Appendix D) to the USEPA containing recommendations for the USEPA to consider as it develops the CAIR replacement rule. The recommendations follow through on the commitment made by these states in the March 9, 2009 Framework Document, contained in Appendix D, to

[1] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Sections 110(a)(2)(D)(i) for the 8-hour Ozone and $PM_{2.5}$ National Ambient Air Quality Standards. United States Environmental Protection Agency," August 15, 2006.

[2] The Federal CAIR program, as established in the Federal rules, was vacated by the U.S. Court of Appeals for the District of Columbia Circuit on July 11, 2008 (State of North Carolina v. Environmental Protection Agency, supra). On December 23, 2008, the court remanded the CAIR to the USEPA without vacatur of CAIR "so that EPA may remedy CAIR's flaws in accordance with" the court's July 2008 opinion vacating CAIR.

work together to address the transport requirements of Section 110(a)(2)(D) of the Clean Air Act, and to attain the ozone and $PM_{2.5}$ NAAQS. Based on the State Collaborative work and past USEPA practice, New Jersey determines that a state significantly contributes to a downwind state if its contribution is one percent (1%) or greater of the applicable NAAQS. In this case, one percent (1%) of the 24-hour (2006) $PM_{2.5}$ NAAQS is 0.35 $\mu g/m^3$. In developing the CAIR, the USEPA used a similar threshold. New Jersey uses a weight-of-evidence approach combining several analyses in this SIP revision to determine significant contributions.

1) New Jersey's Significant Contributions to Other States

a) Contributing Significantly to a Nonattainment Area or Interference with the Maintenance of the NAAQS in Another State

According to the USEPA's 2009 guidance, a state's conclusion regarding its impact on nonattainment and maintenance of the NAAQS in any other state must be supported by "adequate technical analysis."[3] In order to assess New Jersey's significant contributions to the downwind nonattainment or maintenance areas of the 24-hour $PM_{2.5}$ NAAQS in other states, four main modeling analyses are used: CAIR ($PM_{2.5}$ and ozone), NO_x SIP Call, Regional Haze, and the State Collaborative. New Jersey is using the best data available at this time to determine its impact on other states. An explanation of each analysis and how it demonstrates New Jersey's contributions are provided in this section.

$PM_{2.5}$ CAIR Analysis

In its March 2005 analysis in support of the CAIR,[4] the USEPA used a criterion of 0.2 $\mu g/m^3$ for determining whether sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) emissions in a state make a significant contribution to $PM_{2.5}$ nonattainment in another state. Rounding the value of 0.15, the nearest single digit corresponding to about one percent (1%) of the annual $PM_{2.5}$ NAAQS is 0.2 $\mu g/m^3$.[5] The data used in this analysis were for the annual $PM_{2.5}$ standard. The results of the CAIR analysis demonstrated that New Jersey is not a significant contributor to $PM_{2.5}$ nonattainment, for the 15 $\mu g/m^3$ annual NAAQS, in any other state (because its transported contribution of $PM_{2.5}$ is less than 0.2 $\mu g/m^3$).

In a separate rulemaking on April 28, 2006,[6] the USEPA included Delaware and New Jersey in the CAIR for $PM_{2.5}$, based on its assessment that, when combined, New Jersey and Delaware contribute significantly to a downwind state's nonattainment of the annual 15 $\mu g/m^3$ $PM_{2.5}$ NAAQS. Air quality modeling performed to determine the contribution from the projected 2010 SO_2 and NO_x emissions in Delaware and New Jersey combined to $PM_{2.5}$ nonattainment in

[3] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[4] USEPA. Technical Support Document for the Final Clean Air Interstate Rule Air Quality Modeling, Air Quality Modeling Analyses – VII: Modeling to Assess Interstate $PM_{2.5}$ Contributions. United States Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2005.

[5] 70 Fed. Reg. 25191 (May 12, 2005).

[6] 71 Fed. Reg. 25288 (April 28, 2006).

downwind states, showed that the largest contribution from Delaware and New Jersey was 0.23 $\mu g/m^3$ to $PM_{2.5}$ nonattainment in New York County, New York (Manhattan in New York City).[7] This amount exceeded the USEPA's $PM_{2.5}$ significance criterion of 0.2 $\mu g/m^3$.

Ozone Modeling Analyses

For the purpose here, ozone will be used as a surrogate transported pollutant for $PM_{2.5}$ since NO_x (i.e., nitrates) are precursors to $PM_{2.5}$. The transport of the nitrates is occurring with the transport of ground-level ozone and $PM_{2.5}$. Thus, reducing NO_x in New Jersey will also reduce the formation and transport of $PM_{2.5}$. The results of the 8-hour ozone CAIR and the NO_x SIP Call modeling analyses are applied here to assess New Jersey's $PM_{2.5}$ contribution to the nonattainment and attainment/maintenance of the $PM_{2.5}$ NAAQS in other states.

8-Hour Ozone CAIR

In order to quantify a state's contribution to downwind 8-hour ozone nonattainment to support controls required under the USEPA's CAIR, air quality modeling for ozone was conducted by the USEPA using the Comprehensive Air Quality Model with Extensions (CAMx), version 3.10.[8] CAMx is a non-proprietary computer model that simulates the formation and fate of photochemical oxidants including ozone for an input set of meteorological conditions and emissions. CAMx also contains a source apportionment tool which is designed to attribute ozone concentrations predicted at a given set of receptors to emissions from individual source areas, as specified by the user.

These air quality modeling techniques, i.e., zero-out and source apportionment, were used to assess the impact of each upwind State's entire inventory of NO_x and VOC emissions on downwind nonattainment for 2010 and 2015.[9] The USEPA determined that upwind NO_x emissions contribute significantly to 8-hour ozone nonattainment as of the year 2010. Therefore, the USEPA projected NO_x emissions to the year 2010, assuming certain required controls (but not controls required under CAIR), and then modeled the impact of those projected emissions (termed the base case inventory) on downwind 8-hour ozone nonattainment in that year. Projected 8-hour ozone design values in 2010 and 2015 were estimated by combining the relative change in model predicted ozone from 2001 to the future scenario with an estimate of the base year ambient 8-hour ozone design value.[10] Emissions from an upwind State contributed significantly to 8-hour ozone nonattainment if the maximum contribution was at least 2 parts per billion (ppb), the average contribution was greater than one percent, and certain other numerical criteria were met.[11] The USEPA determined that as of 2010, 25 upwind States and the District of Columbia will have contributions to downwind nonattainment areas that are sufficiently high to meet the air quality factor of the transport test. If the upwind State's impact exceeded these

[7] Revised modeling based on comments received by the USEPA changed the combined contribution of New Jersey and Delaware on downwind fine particulate matter nonattainment to 0.21 $\mu g/m^3$.
[8] USEPA. Technical Support Document for the Final Clean Air Interstate Rule Air Quality Modeling, Air Quality Modeling Analyses – VII: Modeling to Assess Interstate $PM_{2.5}$ Contributions. United States Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2005.
[9] 70 Fed. Reg. 25175 (May 12, 2005).
[10] 70 Fed. Reg. 25243 (May 12, 2005).
[11] 70 Fed. Reg. 25175 (May 12, 2005).

thresholds, then the USEPA conducted a further evaluation to determine if the impact was high enough to meet the air quality portion of the "contribute significantly" standard.[12] In doing so, the USEPA organized the outputs of the two modeling techniques into a set of "metrics." The metrics reflect three key contribution factors:

- The magnitude of the contribution (actual amount of ozone contributed by emissions in the upwind State to nonattainment in the downwind area);
- The frequency of the contribution (how often contributions above certain thresholds occur); and
- The relative amount of the contribution (the total ozone contributed by the upwind State compared to the total amount of nonattainment ozone in the downwind area).

Based upon these criteria, the USEPA concluded that New Jersey significantly contributes to 8-hour ozone nonattainment in four (4) states, as listed in Table E1.[13,14] This table does not include all of the USEPA's criteria to determine significant contributions. The counties listed under "Other Contributions" in Table E1 that show New Jersey's contribution is equal to or greater than one percent to 8-hour ozone nonattainment were determined by the USEPA to not have a significant link to New Jersey. Thus, New Jersey did not include those states in its determination of significant contributions for interstate transport of $PM_{2.5}$.

[12] 70 Fed. Reg. 25191 (May 12, 2005).
[13] 70 Fed. Reg. 25249 (May 12, 2005).
[14] USEPA. Technical Support Document for the Final Clean Air Interstate Rule Air Quality Modeling, Air Quality Modeling Analyses – VII: Modeling to Assess Interstate $PM_{2.5}$ Contributions. United States Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2005.

Table E1: New Jersey's Contributions to Projected 2010 8-Hour Ozone Nonattainment in Downwind Areas as Demonstrated by the 8-Hour Ozone CAIR Modeling Analysis

State	County	2010 8-Hour Ozone Base (ppb)	Percent of 8-Hour Ozone due to Transport	2010 NJ Maximum 8-hr ppb Contribution[1]	Percent NJ Contribution
Significant Contributions					
Connecticut	Fairfield	92	80%	23	25%
	Middlesex	90	93%	22	24%
	New Haven	91	95%	23	25%
New York	Erie	87	37%	5	6%
	Richmond	87	55%	52	60%
	Suffolk	91	52%	39	43%
	Westchester	85	56%	35	41%
Pennsylvania	Bucks	94	35%	27	29%
	Chester	85	39%	15	18%
	Montgomery	88	47%	11	13%
	Philadelphia	90	55%	14	16%
Rhode Island	Kent	86	88%	18	21%
Other Contributions					
Delaware	New Castle	85	37%	3	4%
Georgia	Fulton	86	24%	1	1%
Maryland	Anne Arundel	88	45%	1	1%
	Cecil	89	35%	1	1%
	Harford	93	31%	1	1%
	Kent	86	47%	1	1%
Michigan	Macomb	85	43%	0	0%
Ohio	Geauga	87	47%	0	0%
Texas	Denton	87	N/A	N/A	N/A
	Galveston	85	37%	0	0%
	Harris	97	36%	0	0%
	Jefferson	85	50%	0	0%
	Tarrant	87	N/A	N/A	N/A
Virginia	Arlington	86	39%	0	0%
	Fairfax	85	33%	2	2%
Washington DC	Washington DC	85	38%	1	1%
Wisconsin	Kenosha	91	37%	0	0%
	Ozaukee	86	81%	0	0%
	Sheboygan	88	74%	0	0%

1. The maximum 8-hour ozone ppb contribution was only one metric from the USEPA's modeling analysis. Other criteria were met to make the final determination on significant contributions.
2. Data obtained from the CAIR modeling TSD, Table VI-2. Percent contribution to 8-hour ozone nonattainment due to transport from upwind States.

NO_x SIP Call

In 1998, the USEPA finalized a regulation (known as the NO_x SIP Call) requiring 22 States and the District of Columbia to submit SIPs that address the regional transport of ground-level ozone.[15] The plans required reducing emissions of NO_x (a precursor to ozone formation as well as $PM_{2.5}$), to decrease the transport of ozone across state boundaries in the eastern half of the United States. In the development of the NO_x SIP Call, the USEPA performed a number of air quality analyses to support the multi-factor approach to identify upwind areas that contribute significantly to ozone nonattainment in downwind areas.

For the modeling analyses conducted for the NO_x SIP Call, the USEPA made a determination that "significant contribution" includes both air quality factors relating to amounts of upwind emissions and their ambient impact downwind, as well as cost factors relating to the costs of the upwind emission reductions.[16] Full details on the modeling analyses can be found in the modeling technical support document (TSD).[17] The additional modeling for the assessment of contributions consisted of State-by-State zero-out modeling using UAM-V (Variable Grid Urban Airshed Model) and State-by-State source apportionment modeling using the CAMx (Comprehensive Air Quality Model with Extensions) Anthropogenic Precursor Culpability Assessment (APCA) technique. The modeling results showed that New Jersey contains sources which significantly impact ozone nonattainment in the following downwind states: Connecticut, Maine, Massachusetts, New Hampshire, New York, Pennsylvania, and Rhode Island. The quantitative modeling results are summarized in Table E2.

[15] 63 Fed. Reg. 57356 (October 28, 1998).
[16] 63 Fed. Reg. 57356 (October 28, 1998).
[17] USEPA. Air Quality Modeling Technical Support Document for the Regional NO_x SIP Call. Office of Air and Radiation, United States Environmental Protection Agency, September 23, 1998.

Table E2: New Jersey's Contributions to Ozone Nonattainment in Downwind States According to the NO_x SIP Call Modeling Analyses[1]

Downwind State/Area	Maximum Contribution (ppb)		Highest Daily Average Contribution (ppb)		Frequency of Contribution		Relative Amount (% of total manmade ppb: ≥ 125 ppb (1-hr) ≥ 85 ppb (8-hr))	
	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr
Western Massachusetts (1-hr) Massachusetts (8-hr)	30	39	23	-	10 ppb to 100% of exceedances	10 ppb to 59% of exceedances	16	16
Boston, Massachusetts	42	-	25	-	5 ppb to 52% of exceedances	-	7	-
Greater Connecticut (1-hr) Connecticut (8-hr)	62	54	45	30	10 ppb to 99% of exceedances	10 ppb to 81% of exceedances	26	23
Portland, Maine (1-hr) Maine (8-hr)	9	21	9	10	5 ppb to 39% of exceedances	5 ppb to 48% of exceedances	4	7
Rhode Island	48	36	38	19	10 ppb to 100% of exceedances	10 ppb to 61% of exceedances	30	20 (on the highest day)
New Hampshire	-	26	-	-	-	5 ppb to 45% of exceedances; 10 ppb to 23% of exceedances	-	9
New York	-	64	-	37	-	10 ppb to 81% of exceedances	-	31
Pennsylvania	-	40	-	17	-	2 ppb to 5% of exceedances	-	19 (on the highest day)

1. This table was compiled using Appendices C and D in the United States Environmental Protection Agency's report entitled, "Air Quality Modeling Technical Support Document for the Regional NO_x SIP Call," September 23, 1998.

To summarize the ozone modeling analyses applied to New Jersey's weight-of-evidence approach, ozone is being used as a surrogate transported pollutant for $PM_{2.5}$ since NO_x (i.e., nitrates) are precursors to $PM_{2.5}$. The results of these analyses indicate that New Jersey impacts the air quality in Connecticut, Maine, Massachusetts, New Hampshire, New York, Pennsylvania, and Rhode Island.

Regional Haze Modeling Analysis

Visibility impairment caused by the collection of air pollutants (primarily $PM_{2.5}$) emitted by sources over a broad geographic area is known as regional haze.[18] Particulate matter is the major cause of reduced visibility in many parts of the United States. As part of the regional haze SIP[19] coordination in the Northeastern United States, a regional assessment was conducted to establish

[18] 64 Fed. Reg. 35714 (July 1, 1999).
[19] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

the baseline and natural visibility conditions at Class I[20] areas, to identify the states which contribute to visibility impairment at Class I areas, and to establish the 2018 Reasonable Progress Goal. New Jersey relied upon the contribution assessment work performed for MANE-VU by NESCAUM. NESCAUM used several techniques, rather than rely upon one single method, to assess which states contribute to visibility impairment in MANE-VU Class I areas. These techniques included: evaluating emission inventories, sulfur dioxide emissions divided by distance, emissions times upwind probability, the dispersion model CALPUFF, and the grid model Regulatory Modeling System for Aerosols and Deposition (REMSAD). A summary of those techniques is discussed in New Jersey's regional haze SIP.[21] Since the assessment for the visibility goals used only the Class I areas as the receptors, the analysis was only performed for seven (7) Class I areas in Maine, New Hampshire, New Jersey, Vermont, Virginia, and West Virginia. For example, since Connecticut does not have a Class I area, the impacts from New Jersey and other states were not evaluated.

MANE-VU applied the following three criteria to identify states and regions for the purposes of consultation on regional haze:

1. Any state/region that contributed 0.1 $\mu g/m^3$ sulfate or greater on the 20 percent worst visibility days in the base year (2002),
2. Any state/region that contributed at least 2 percent of total sulfate observed on the 20 percent worst visibility days in 2002, and
3. Any state/region among the top ten contributors on the 20 percent worst visibility days in 2002.

For the purposes of deciding how broadly to consult, the MANE-VU States settled on the second of the three criteria: any state/region that contributed at least 2 percent of total sulfate observed on the 20 percent worst visibility days in 2002.[22] New Jersey did not meet the criteria and it was concluded to not significantly contribute to visibility impairment in any of the Class I areas identified. Table E3 summarizes New Jersey's impact on the annual sulfate concentrations in these areas by analysis.

[20] Class I areas are defined as any national park larger than 6,000 acres in size, national wilderness areas or memorial parks greater than 5,000 acres in size, and all international parks which were in existence on August 7, 1977.

[21] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

[22] Connecticut, Rhode Island, Vermont, and the District of Columbia were not identified as being among the political or regional units contributing at least 2 percent of sulfate at any of the seven Class I areas. However, as participants in MANE-VU, those entities have agreed to pursue adoption of regional control measures aimed at visibility improvement on the haziest days and prevention of visibility degradation on the clearest days. This is why MANE-VU states identified other MANE-VU states that did not contribute the 2 percent as contributing to them as MANE-VU members.

Table E3: New Jersey's Contributions by Percent (%) to the Annual Sulfate Concentration in Class I Areas by Analysis[1]

	Class I Area						
Modeling Analysis	**Acadia, ME**	**Brigantine, NJ**	**Dolly Sods, WV**	**Great Gulf, NH**	**Lye Brook, VT**	**Moosehorn, ME**	**Shenandoah, VA**
REMSAD (%)	1.40	4.04	0.27	0.89	1.44	1.03	0.48
Q/D[2] (%)	0.76	4.22	0.43	3.11	0.75	0.48	1.82
CALPUFF[3] (NWS[4] Observations) (%)	0.98	3.37	0.28	0.63	0.67	0.75	0.52
CALPUFF (MM5[5]) (%)	0.97	3.60	NA	NA	0.91	NA	0.49
Percent time upwind method (%)	1.02	6.01		0.99	1.39	0.78	0.49

1. Full details on the modeling analyses can be found at: MANE-VU. Contributions to Regional Haze in the Northeast and Mid-Atlantic: Mid-Atlantic/Northeast Visibility Union (MANE-VU) Contribution Assessment United States. Prepared by Northeast States for Coordinated Air Use Management (NESCAUM) for the Mid-Atlantic/Northeast Visibility Union (MANE-VU), August 2006.
2. Q/D = Empirical emissions divided by distance approach
3. CALPUFF = Lagrangian dispersion model developed by EarthTech, Inc.
4. NWS = National Weather Service
5. MM5 = Fifth Generation Mesoscale Model

The full details of the modeling analyses listed can be found in the regional contribution assessment report.[23] There is substantial consistency across a variety of analysis methods using techniques based on disparate chemical, meteorological, and physical principles. Taken together, these findings create a strong weight-of-evidence case for the preliminary identification of the most significant contributors to visibility impairment in the MANE-VU Class I areas. These findings are relevant to the 24-hour $PM_{2.5}$ standards because $PM_{2.5}$ is the primary component of regional haze as they suggest that an effective emissions management approach would rely heavily on broad-based regional SO_2 control efforts in the eastern United States aimed at reducing summertime $PM_{2.5}$ concentrations.

The Regional Haze assessment concluded that New Jersey does not significantly contribute to visibility impairment, based on sulfate impacts, to the Class I areas in Maine, New Hampshire, Vermont, West Virginia, and Virginia. Maine, New Hampshire, and Vermont included New Jersey as a contributing state in their Regional Haze SIPs, based on an agreement that all MANE-VU states would be included as impacting MANE-VU Class I areas.

[23] MANE-VU. Contributions to Regional Haze in the Northeast and Mid-Atlantic: Mid-Atlantic/Northeast Visibility Union (MANE-VU) Contribution Assessment United States. Prepared by Northeast States for Coordinated Air Use Management (NESCAUM) for the Mid-Atlantic/Northeast Visibility Union (MANE-VU), August 2006.

State Collaborative Modeling Analysis

The Midwestern, Mid-Atlantic, and Northeastern states agreed to work together to develop a framework to achieve the public health goals of the ozone and particulate matter standards in March 2009 (see Appendix D). Some of the Southeastern states also participated in the technical effort. This became known as the State Collaborative effort. A significant modeling effort was undertaken to support on-going State Collaborative policy discussions, estimate interstate impacts according to 42 U.S.C. § 7410(a)(2)(D)(i) (Section 110(a)(2)(D)(i)), and to assess future control programs for more stringent ozone and particulate matter standards. While this effort was intended to inform the Collaborative process, it was not intended for regulatory or legal purposes. Thus, the results are only meant to provide reasonable estimates of significant contributions and emission reductions (discussed later) that can support state policy making. The weight-of-evidence approach allows for the incorporation of the State Collaborative modeling results to better inform New Jersey's decisions with respect to interstate transport.

The modeling analyses demonstrated that New Jersey significantly contributes to the annual and 24-hour $PM_{2.5}$ levels for 2005 in the following nonattainment areas: Lancaster and York, Pennsylvania; Baltimore, Maryland; Northern New Jersey/New York/Connecticut; New York City, New York; and New Haven, Connecticut (refer to Appendix D). The criteria for significance used was equivalent to one percent (1%) of the standard. Table E4 lists New Jersey's contribution to both the annual and 24-hour $PM_{2.5}$ concentrations to those nonattainment areas.

Table E4: New Jersey's Contributions to Annual and 24-Hour Fine Particulate Matter Nonattainment Demonstrated by the State Collaborative Modeling Analysis for 2005

Nonattainment Area	Lancaster	York	Baltimore	New York-N.New Jersey-Long Island	New York City	New Haven
State(s)	PA	PA	MD	NY-NJ-CT	NY	CT
24-Hour $PM_{2.5}$ Contribution ($\geq$0.35 $\mu g/m^3$)	1.38	1.31	1.48	15.82	5.29	1.94
Annual $PM_{2.5}$ Contribution ($\geq$0.15 $\mu g/m^3$)	0.59	0.43	0.38	6.07	2.22	0.40

Summary of the Modeling Analyses

The four modeling analyses applied in addressing New Jersey's significant contributions to the 24-hour $PM_{2.5}$ NAAQS represent a weight-of-evidence approach to satisfying this requirement. Table E5 provides a summary of the results of the modeling analyses used in this approach.

Table E5: Summary of New Jersey's Contributions to Other States' Fine Particulate Matter Concentrations by Analysis

Analysis	$PM_{2.5}$ CAIR Modeling		8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling
State(s)	NJ Only	NJ+DE	NJ Only	NJ Only	NJ Only	NJ Only
Connecticut			x	x		x
Maine				x		
Maryland						x
Massachusetts				x		
New Hampshire				x		
New York		x	x	x		x
Pennsylvania			x	x		x
Rhode Island			x	x		

1. The regional haze analyses concluded that New Jersey did not significantly impact any of the states with Class I areas analyzed in the study.

Other Factors in Significant Contribution Assessment

New Jersey's weight-of-evidence approach uses the best data available.[24] As better tools become available, to the extent necessary, New Jersey will re-evaluate its determinations. While the methods analyzed did not identify Delaware as a state that New Jersey impacts, the methods did identify all of the states surrounding Delaware. Hence, New Jersey includes Delaware among the other states to which New Jersey significantly contributes.

States listed in Table E5 that are not part of a $PM_{2.5}$ nonattainment area, i.e., attainment/maintenance areas, include Maine, Massachusetts, New Hampshire, and Rhode Island. The ambient air quality data shown in Table E6 shows that although these states continue to meet the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS, there are states that are "close to," i.e., within five (5) percent the standard. The USEPA defined the WOE range for the 65 $\mu g/m^3$ 24-hour (1997) $PM_{2.5}$ NAAQS for attainment modeling purposes as between 62 and 68 $\mu g/m^3$, which is five (5) percent of the standard.[25] Applying this same approach to New Jersey's contribution analysis, Maine and Rhode Island do not have monitors that are demonstrating 24-hour $PM_{2.5}$ concentrations close to the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS.

[24] The modeling analyses presented do not accurately model emissions on high electrical demand days (HEDDs), which are hot, summer days on which the electrical demand is high and supplemented with uncontrolled electrical generating units that produce a significant amount of NO_x.

[25] USEPA. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze. United States Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Analysis Division, Air Quality Modeling Group, Research Triangle Park, NC, EPA-454/B-07-002, April 2007.).

Table E6: 2005-2008 Ambient Air Quality Data for 24-Hour $PM_{2.5}$ in Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont Compared to the 35 µg/m^3 24-Hour (2006) $PM_{2.5}$ NAAQS

			24-Hour $PM_{2.5}$ Monitored Design Values (µg/m^3)[1]				Percent within the 35 µg/m^3 24-Hour $PM_{2.5}$ NAAQS (%)			
State	**Monitor Site**	**AQS Monitor ID**	**2005**	**2006**	**2007**	**2008**	**2005**	**2006**	**2007**	**2008**
ME	Lewiston - CKP	23-001-0011	29	26	24	26	17	26	31	25
	Madawaska - Tang's Palace	23-003-0013	25	25	22	24	29	29	37	31
	Presque Isle - Riverside Street	23-003-1011	24	24	21	20	31	31	40	43
	Portland - Tukey's Bridge	23-005-0015	N/A	N/A	N/A	22	N/A	N/A	N/A	37
	Portland - EMPACT	23-005-0027	31	27	N/A	N/A	11	23	N/A	N/A
	Acadia NP - McFarland Hill	23-009-0103	23	22	22	20	34	37	37	43
	Augusta - Lincoln St School	23-011-0016	28	26	24	26	20	26	31	26
	Rumford - Rumford Avenue Parking Lot	23-017-2001	30	29	25	32	14	17	29	9
MA	Pittsfield	25-003-5001	34	30	30	27	3	14	14	N/A
	Fall River-Globe St	25-005-1004	N/A	N/A	N/A	25	N/A	N/A	N/A	29
	Lynn	25-009-2006	33	26	27	27	6	26	23	N/A
	Haverhill	25-009-5005	N/A	27	27	27	N/A	23	23	N/A
	Lawrence	25-009-6001	N/A	28	28	27	N/A	20	20	N/A
	Chicopee	25-013-0008	N/A	27	28	28	N/A	23	20	20
	Springfield-Liberty P-Lot	25-013-0016	N/A	32	31	31	N/A	9	11	11
	Chelmsford	25-017-0009	N/A	N/A	N/A	25	N/A	N/A	N/A	29
	Brockton	25-023-0004	29	28	29	28	17	20	17	20
	Boston-Kenmore Sq	25-025-0002	N/A	29	30	29	N/A	17	14	18
	Boston-One City Sq	25-025-0027	N/A	30	N/A	28	N/A	14	N/A	21
	Boston-Harrison Ave	25-025-0042	N/A	29	N/A	29	N/A	17	N/A	17
	Boston-North St	25-025-0043	34	31	31	28	3	11	11	20
	Worcester-Washington St	25-027-0016	N/A	30	30	29	N/A	14	14	17
	Worcester-Summer St	25-027-0023	N/A	31	N/A	N/A	N/A	11	N/A	N/A
NH	Laconia-Green St	33-001-2004	20	21	20	18	43	40	43	50
	Keene	33-005-0007	31	31	29	34	11	11	17	3
	Berlin	33-007-0014	27	26	N/A	N/A	23	26	N/A	N/A
	Lebanon	33-009-0010	N/A	N/A	23	21	N/A	N/A	34	39
	Manchester-Pearl St	33-011-0020	29	N/A	N/A	N/A	17	N/A	N/A	N/A
	Nashua-Crown St	33-011-1015	N/A	N/A	27	27	N/A	N/A	23	23
	Peterborough	33-011-5001	26	N/A	N/A	N/A	26	N/A	N/A	N/A
	Pembroke	33-013-1006	N/A	26	25	24	N/A	26	29	31
	Portsmouth-Pierce Island	33-015-0014	N/A	26	25	24	N/A	26	29	31
	Claremont	33-019-0003	N/A	30	26	25	N/A	14	26	28
RI	West Greenwich	44-003-0002	N/A	N/A	N/A	22	N/A	N/A	N/A	36
	Providence-Prairie Ave	44-007-0022	N/A	N/A	29	29	N/A	N/A	17	18
	Providence-Eddy St	44-007-0028	N/A	N/A	N/A	27	N/A	N/A	N/A	22
	East Providence	44-007-1010	N/A	N/A	N/A	27	N/A	N/A	N/A	24

1. The 2005-2007 data are quality-assured. The 2008 data are use for comparison and should not be applied as official numbers.
2. N/A = Data Not Available

Conclusion for New Jersey's Significant Contributions

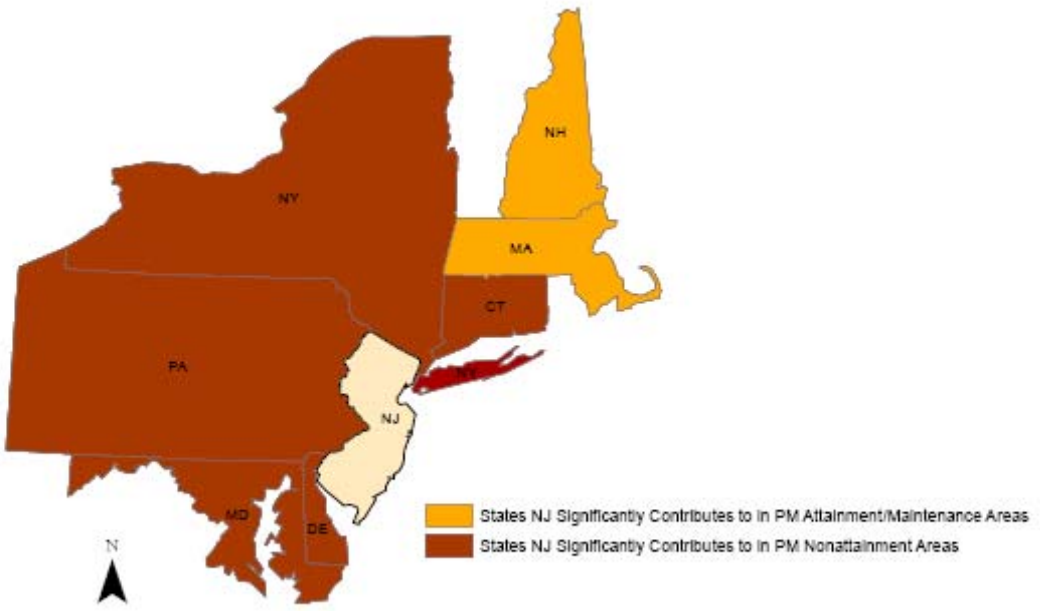
In conclusion, New Jersey determines that with respect to the 35 µg/m^3 24-hour (2006) $PM_{2.5}$ NAAQS that it significantly contributes to Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, and Pennsylvania, as shown in Table E7 and Figure E1.

Table E7: Summary of New Jersey's Significant Contributions to Other States' Fine Particulate Matter Concentrations

Analysis	$PM_{2.5}$ CAIR Modeling		8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling	Significant Contribution? (Y/N)
State(s)	**NJ Only**	**NJ+DE**	**NJ Only**	**NJ Only**	**NJ Only**	**NJ Only**	
Connecticut			x	x		x	Y
Delaware							Y
Maryland						x	Y
Massachusetts				x			Y
New Hampshire				x			Y
New York		x	x	x		x	Y
Pennsylvania			x	x		x	Y

1. The regional haze analyses concluded that New Jersey did not significantly impact any of the other states with Class I areas analyzed in the study.

Figure E1: States to which New Jersey Significantly Contributes with respect to Fine Particulate Concentrations in Other States based upon a Weight-of-Evidence Approach



b) Interference with Measures Required to Meet the Implementation Plan for Any Other State Related to Prevention of Significant Deterioration (PSD)

The previous subsection summarizes the states New Jersey significantly impacts related to attainment and maintenance of the $PM_{2.5}$ NAAQS. 42 U.S.C. § 7410(a)(2)(D)(i)(II) (Section 110(a)(2)(D)(i)(II)) also requires protections to prevent further degradation of attainment and maintenance areas. According to the USEPA's 2009 guidance, "this requirement is satisfied for $PM_{2.5}$ if a state's SIP includes preconstruction review programs for major sources that satisfy the requirements of 40 C.F.R. 51.165(b)(1) and 40 C.F.R. 51.166" (NSR and PSD, respectively).[26] The USEPA guidance also states, "Unless the area has known outstanding permit program deficiencies, it is not necessary, at this time, for states to make a SIP submission containing rule changes specifically to address section 110(a)(2)(D)(i)(II) for the 2006 24-hour $PM_{2.5}$ NAAQS. If this is the case, the state can submit an appropriate certification as described previously in this guidance."[27] In addition, notwithstanding the absence of PSD increments for $PM_{2.5}$, the USEPA believes that states may continue to rely upon their existing PSD and NNSR permitting programs to prevent significant deterioration of air quality within their own boundaries and in adjacent states until such increments are established. New Jersey's existing PSD and NSR programs and subsequent revisions provide and will continue to provide these protections for new or modified sources. The details of these programs are discussed in Section A. New Jersey certifies that it has a PSD program in place.

c) Interference with Measures Required to Meet the Implementation Plan for Any Other State Related to Regional Haze and Visibility

42 U.S.C. § 7410(a)(2)(D)(i)(II) (Section 110(a)(2)(D)(i)(II)) requires protections to protect visibility. According to the USEPA's 2009 guidance, this requirement consists of two phases of visibility protection, i.e., reasonably attributable visibility impairment (RAVI) (Phase 1) and regional haze (Phase 2).[28] RAVI is visibility impairment attributable to a single source/small group of sources and regional haze is impairment from a multitude of sources over a large area. New Jersey's Regional Haze SIP[29] addresses both regional haze and RAVI. The following discussion provides an explanation of how New Jersey is meeting these requirements.

Reasonably Attributable Visibility Impairment (RAVI)

Under the 1980 Federal regulations, currently at 40 C.F.R. 51.300-51.307, New Jersey was included in the 35 states that were required to submit SIPs to address RAVI at 40 C.F.R.

[26] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[27] ibid.

[28] USEPA Memorandum from William T. Harnett, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, "Guidance on SIP Elements Required Under Sections 110(a)(1) and (2) for the 2006 24-Hour Fine Particle ($PM_{2.5}$) National Ambient Air Quality Standards (NAAQS)," September 25, 2009. (see Appendix C).

[29] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

51.300(b)(2). At 40 C.F.R. 52.1606, New Jersey is under a Federal Implementation Plan (FIP) for visibility monitoring (requirement at 40 C.F.R. 51.305 and provisions at 40 C.F.R. 52.26), New Source Review (requirement at 40 C.F.R. 51.307 and provisions at 40 C.F.R. 52.28), and a long-term strategy (provisions at 40 C.F.R. 52.29). New Jersey has addressed these components in its Regional Haze SIP.[30] This document outlines New Jersey's long-term plan (2018) for addressing visibility-impairing air pollution within its borders and from out-of-state sources that impact New Jersey's Federally protected visibility area or Class I area, the Brigantine Wilderness Area. The following section from the Regional Haze SIP addresses the RAVI requirement:

> ***10.2 Other Commitments***
> ***10.2.1 Visibility***
> *New Jersey commits to continue carrying out the required review of proposed sources impact on visibility under 40 C.F.R. § 52.26 and 52.28, by implementing the Prevention of Significant Deterioration (PSD) permit requirements for new or modified major sources of air pollutants located within 100 kilometers of the Class I area, or within a larger radius on a case-by-case basis, in accordance with all applicable Federal rules for review of the impacts on Class I areas.*
>
> *New Jersey's PSD program prevents new and modified sources from significantly impacting visibility. The PSD program includes a requirement that evaluates the new source's visibility impact on any nearby Class I areas (Brigantine in New Jersey's case). In some cases, the Federal Land Manager may exempt smaller, more distant PSD sources from having to do the visibility analysis, but the larger sources with the greatest chance of adversely impacting visibility at Brigantine will have to address the issue. In addition, older sources are expected to shut down with time, and new source emissions are minimized, thereby improving air quality and enhancing visibility at Brigantine.*
>
> *The Federal Land Manager is expected to finalize guidance for determining whether a PSD source addresses visibility impacts in mid 2010. This will be part of a new guidance document known as Federal Land Managers' Air Quality Related Values Work Group 2 (FLAG 2). There will be an equation that adds the total NO_x, SO_2, sulfuric acid mix, and PM10 emissions in tons per year, and then divides by the distance to the Class I area in kilometers (km). If the result is greater than 10, a visibility analysis must be done. The non-PSD sources will be reviewed on a case by case basis depending on the emissions and the distance.*
>
> ***10.2.2 Consultation with Federal Land Managers***
> *New Jersey commits to coordinate on-going consultation with the appropriate Federal Land Manager and the USEPA regarding future progress reports and State plan revisions.*

New Jersey certifies that no source within the State emits pollutants that interfere with RAVI measures included in the applicable implementation plan of another state.

[30] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

Regional Haze

New Jersey is meeting the regional haze requirement through its Regional Haze SIP. The latest revision was submitted to the USEPA on July 29, 2009.[31] As discussed in subsection 1 above, the contribution assessment performed for the Regional Haze SIP concluded that New Jersey does not significantly contribute to visibility impairment, based on sulfate impacts at the Class I areas in Maine, New Hampshire, Vermont, West Virginia, and Virginia.[32] Maine, New Hampshire, and Vermont included New Jersey in their Regional Haze SIPs, based on an agreement that all MANE-VU states would be included as impacting MANE-VU Class I areas.[33,34,35]

d) New Jersey's Remedy to its $PM_{2.5}$ Interstate Contributions

New Jersey has taken a number of recent actions as well as measures that have been in place for many years to address its contribution to downwind areas. Table E8 lists New Jersey's recently adopted control measures that reduce $PM_{2.5}$, SO_2, NO_x, and VOC emissions.[36] Some of these SIP measures are approved by the USEPA, as listed in 40 C.F.R. Part 52, Subpart FF, while other measures are pending approval by the USEPA.

[31] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.
[32] Refer to the "Regional Haze Modeling Analysis" section for more details.
[33] Maine's regional haze SIP is not yet available but electronic communication with Maine supports that New Jersey does not significantly contribute to its Class I Areas.
[34] NHDES. New Hampshire Regional Haze SIP Revision, Final Draft. New Hampshire Department of Environmental Services, November 3, 2008.
[35] VTDEC. Vermont State Implementation Plan (SIP) Revision Regional Haze, Draft. State of Vermont, Department of Environmental Conservation (DEC), January 15, 2009.
[36] Although the USEPA does not consider VOC as a $PM_{2.5}$ precursor for SIP and conformity purposes, New Jersey anticipates a $PM_{2.5}$ benefit from the implementation of these measures.

Table E8: New Jersey's Recently Adopted Control Measures to Reduce Emissions of $PM_{2.5}$ and its Precursors

Measure	Pollutant Reduced			
	$PM_{2.5}$	SO_2	NO_x	VOC*
Boilers Serving Electric Generating Units (EGUs) (Coal)	x	x	x	
Boilers Serving EGUs (Oil and Gas)			x	
CAIR/NO_x Budget		x	x	
Refinery Consent Decrees	x	x	x	x
PSEG-Consent Decree	x	x	x	
Asphalt Production			x	
NO_x Reasonably Available Control Technology) (RACT) Rule (2006)			x	
Industrial/Commercial/Institutional Boilers (2009)			x	
Glass Manufacturing			x	
Municipal Waste Combustor NO_x rule			x	
Case by Case NO_x (Facility-Specific Emission Limits (FSELs)/Alternative Emission Limits (AELs))			x	
High Electrical Demand Day (HEDD)			x	
Sewage sludge incinerators			x	
On-board Diagnostics (OBD) I/M			x	
Diesel Vehicle Idling	x		x	
Diesel Vehicle Inspection and Maintenance (I/M)	x		x	
Diesel Vehicle Retrofit Program	x			
Architectural Coatings 2005				x
Portable Fuel Containers 2005				x
Consumer Products 2005				x
Consumer Products 2009				x
Portable Fuel Containers 2009				x
Adhesives & Sealants				x
Petroleum Storage				x
Case by Case VOC (AELs)				x
Asphalt Paving (cutback and emulsified)				x
Group 1: Printing				x
Energy Master Plan	x	x	x	x
Mercury Rule	x	x	x	

* Although the USEPA does not consider VOC as a $PM_{2.5}$ precursor for SIP and conformity purposes, New Jersey anticipates some $PM_{2.5}$ benefit from the implementation of these measures. New Jersey has not quantified this benefit and is including the VOC measures in this list for informational purposes.

New Jersey is also proposing or evaluating additional measures that would reduce $PM_{2.5}$ emissions. These are summarized in Table E9.

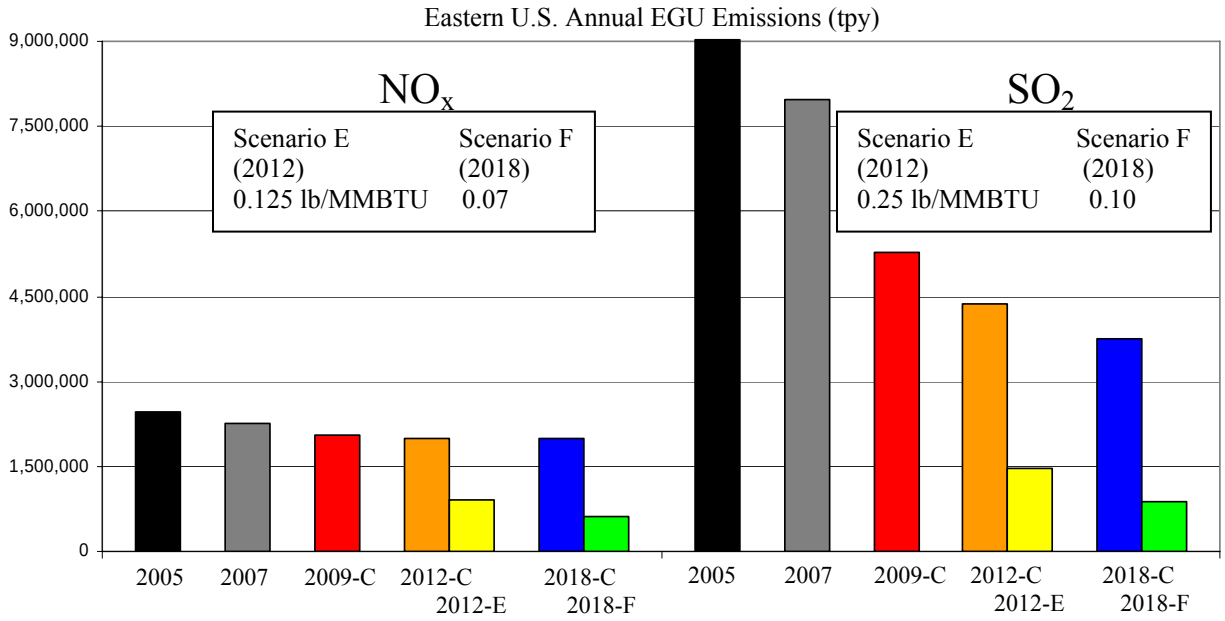
Table E9: Control Measures under Evaluation

Measure	Current Status of Measure
Low sulfur distillate and residual fuel strategies	Proposed 11/16/2009 (41 N.J.R. 4156(a)), Implementation in 2014 with 2016 as Phase 2
Fugitive Dust at Stationary Sources	Analysis underway
Open Burning Permit Revisions	Analysis underway
#6 Fuel Oil-Fired Boilers	To be evaluated
Stationary Diesel Engines	To be evaluated
Residential Wood Burning Strategies	To be evaluated
Greenhouse Gas Reduction Plan	Proposed
Refineries	Analysis underway

As part of its evaluation of potential control measures, New Jersey worked with other states in the OTC and LADCO and reached a consensus through the State Collaborative on recommendations to the USEPA on a framework that the USEPA should follow to develop a replacement rule for the CAIR (see Appendix D). This framework included potential controls not only for national rules involving significantly contributing states that combine statewide emission caps and complementary regional trading programs but support for a Federal program that also requires substantial regional emission reductions from mobile and area sources. Quantitative analyses performed showed that New Jersey could reduce its impact if controls are applied to EGUs. In one of the assessments conducted by the OTC, applying EGU emission control rates of 0.07 pounds per million British Thermal Units (lb/mmBTU) for NO_x and 0.15 lb/mmBTU for SO_2 in New Jersey would reduce emissions by 27 percent (%) (2,483 tons) and 33 percent (%) (6,934 tons) for 2008, respectively (see Appendix D, "OTC CAIR Replacement Rule Recommendation Technical Support Document"). Using that assessment as a guide to determine what EGU emission control rates to recommend, similar rates were modeled for 2012 and 2018, as shown in Figure E2. Figure E3 shows the improvement in daily $PM_{2.5}$ concentrations across the region for 2012. Figure E4 shows that only five (5) counties in the Northeast, including counties in New Jersey, are not attaining the daily $PM_{2.5}$ standard in 2012. Thus, the regional modeling performed shows that an EGU-based strategy would have a positive impact on $PM_{2.5}$ air quality in the region and that while nearby sources have the greatest impact, significant contribution to levels of $PM_{2.5}$ can come from states several hundred miles away. This modeling demonstrates that New Jersey would reduce its daily $PM_{2.5}$ significant contributions through a future EGU-based control strategy prior to the expected attainment date of 2014 for the 35 $\mu g/m^3$ daily $PM_{2.5}$ NAAQS. This control strategy proposal is similar to performance standards adopted by New Jersey on March 20, 2009,[37] which will be effective by December 2012. New Jersey's emission rate for SO_2 is as stringent as modeled. The NO_x emission rates are comparable to the rate modeled, i.e., 0.125 lb/mmBTU, depending upon the averaging times relevant for the model. Thus, the estimated EGU reductions from the rule are anticipated to be similar to the reductions assumed in the modeling scenario described above.

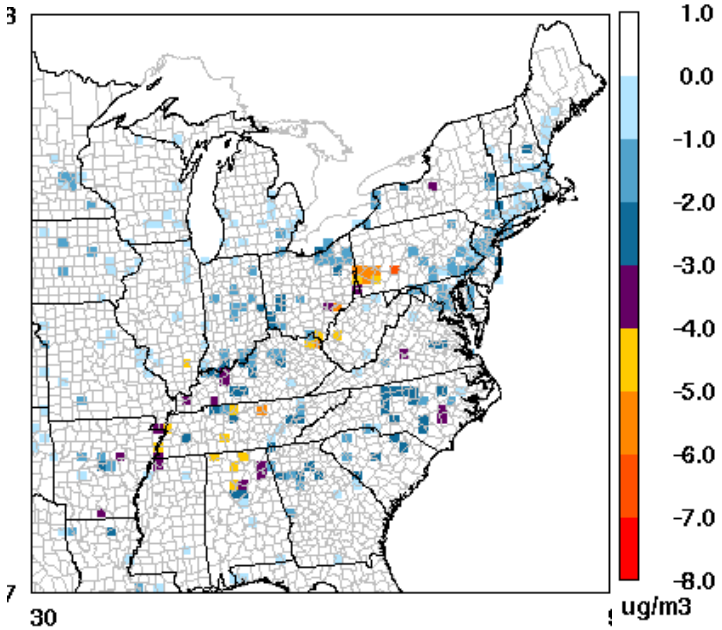
[37] Adopted Rules Published in NJ Register - 41 N.J.R. 1752(a).

Figure E2: Modeled EGU Emission Control Rates by the State Collaborative*



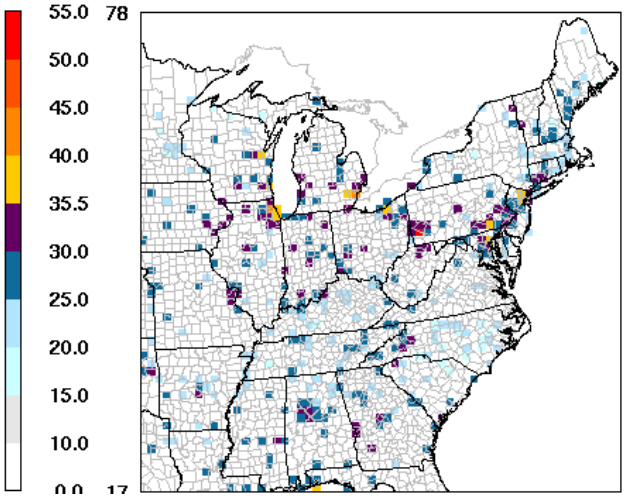
* Refer to Appendix D for more details.

Figure E3: Daily $PM_{2.5}$ Air Quality Improvement for 2012*



*Refer to Appendix D for more details.

Figure E4: Daily $PM_{2.5}$ Concentrations in 2012*



* Refer to Appendix D for more details.

New Jersey is complying with the Federal Clean Air Act's requirements regarding interstate transport as it relates to the $PM_{2.5}$ NAAQS and is doing more to ensure that it is not interfering with the ability of its neighboring states to attain and maintain that standard or visibility goals. While many of New Jersey's existing control measures listed in Tables E8 and E9 are already more stringent than the existing pollution control requirements in many neighboring states, New Jersey will consider any additional measures, which will be implemented by the neighboring upwind and downwind states, such as those modeled by the State Collaborative, if they would provide additional emission reductions.

The control measures implemented in New Jersey address its contributions to the downwind areas, ensuring that its sources' emissions do not interfere with the attainment or maintenance of the 24-hour $PM_{2.5}$ NAAQS or measures that prevent significant deterioration and protect visibility in another state. New Jersey expects the other significantly contributing states to the downwind areas of interest to timely implement reasonable measures, including measures similar to New Jersey's, to address their contributions and to help bring the areas into attainment of the $PM_{2.5}$ NAAQS, preserving the maintenance of the standard, and meeting visibility goals.

2) Other States' Significant Impacts on New Jersey

Applying the same weight-of-evidence approach, New Jersey assessed the significant impact that other states have on New Jersey's $PM_{2.5}$ nonattainment in its thirteen (13) counties designated as not attaining the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS and interfere with the maintenance of attainment in the remaining eight (8) counties. These analyses represent the best available data at the time of this SIP revision.

$PM_{2.5}$ CAIR Analysis

The USEPA's modeling analysis in support of the CAIR indicated that the following states significantly contribute to $PM_{2.5}$ nonattainment in New Jersey's associated $PM_{2.5}$ multi-state nonattainment areas: [38]

- Maryland/Washington, D.C.,
- Michigan,
- New York,
- Ohio,
- Pennsylvania,
- West Virginia, and
- Virginia.

The same analysis indicates that the following upwind states significantly contribute to $PM_{2.5}$ nonattainment in Union County, New Jersey:[39]

- Maryland/Washington, D.C.,
- Michigan,
- New York,
- Ohio,
- Pennsylvania, and
- West Virginia.

Table E10 summarizes the annual average $PM_{2.5}$ significant contributions from the upwind states on Union County's nonattainment for the annual standard.

Table E10: Fine Particulate Matter Significant Contributions to Union County in 2010 According to CAIR Modeling[1]

Upwind State	$PM_{2.5}$ Contribution ($\mu g/m^3$)
Maryland/D.C.	0.25
Michigan	0.20
New York	0.34
Ohio	0.51
Pennsylvania	0.81
West Virginia	0.25

1. Data Source: Appendix H - $PM_{2.5}$ Contributions to Each Nonattainment County in 2010, Technical Support Document for the Final Clean Air Interstate Rule Air Quality Modeling. United States Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2005.

[38] USEPA. Technical Support Document for the Final Clean Air Interstate Rule Air Quality Modeling, Air Quality Modeling Analyses – VII: Modeling to Assess Interstate $PM_{2.5}$ Contributions. United States Environmental Protection Agency Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2005.
[39] Union County was the only New Jersey county identified in nonattainment by the USEPA's CAIR analysis.

Whereas the CAIR modeling analyses addressed the combined significant impacts of Delaware's and New Jersey's emissions on other states, it did not analyze the impacts from other states on Delaware and New Jersey combined.

Ozone Modeling Analysis

As discussed in the previous subsection on New Jersey's significant contributions, ozone will be used as a surrogate transported pollutant for $PM_{2.5}$ since NO_x (i.e., nitrates) are precursors to $PM_{2.5}$.

8-Hour Ozone CAIR

The modeling results from the 8-hour ozone CAIR analysis showed that several upwind states contribute to 8-hour ozone nonattainment in New Jersey counties projected to be in nonattainment in 2010 and 2015. Table E11 lists these counties, the percent of 8-hour ozone due to transport, and the upwind contributing states.

Table E11: Upwind Contributing States to Projected 2010 8-Hour Ozone Nonattainment in New Jersey Counties as Demonstrated by the 8-Hour Ozone CAIR Modeling Analysis

New Jersey County	2010 Base 8-Hour Ozone (ppb)	Percent of 8-Hour Ozone due to Transport	Contributing States[1]
Bergen	86	38%	MD/DC, MI, OH, **PA**, VA, WV
Camden	91	57%	DE, MD/DC, MI, OH, **PA**, VA, WV
Gloucester	91	62%	DE, **MD/DC**, MI, OH, PA, VA, WV
Hunterton	89	26%	DE, MD/DC, OH, **PA**, VA, WV
Mercer	95	36%	DE, MD/DC, MI, NY, OH, **PA**, VA, WV
Middlesex	92	62%	DE, MD/DC, MI, NY, OH, **PA**, VA, WV
Monmouth	86	65%	DE, MD/DC, MI, NY, OH, **PA**, VA, WV
Morris	86	63%	DE, MD/DC, MI, NY, OH, **PA**, VA, WV
Ocean	100	82%	DE, MD/DC, MI, NY, OH, **PA**, VA,WV

1. The most contributing state is noted in **bold** and is underlined.

Based upon this modeling analysis, most of the 8-hour ozone calculated at the New Jersey monitors is due to transport with Pennsylvania as the major contributing state in most cases.

NO_x SIP Call

The modeling results from the NO_x SIP Call analysis showed that several upwind states contain sources which significantly impact ozone nonattainment in New Jersey.[40] The upwind states identified were Delaware, District of Columbia, Illinois, Indiana, Kentucky, Maryland, Michigan, North Carolina, New York, Ohio, Pennsylvania, Virginia, and West Virginia. Tables E12 and E13 summarize the quantitative results from this modeling. Full details on the modeling results are discussed in the USEPA's report entitled, "Air Quality Modeling Technical Support Document for the Regional NO_x SIP Call," September 23, 1998.

[40] 63 Fed. Reg. 57356 (October 28, 1998).

Table E12: Others States' Contributions to 8-hour Ozone Nonattainment in New Jersey According to the NO_x SIP Call Modeling Analyses[1,2]

Upwind State/Area Model Type	Maximum Contribution (ppb)	Highest Daily Average Contribution (ppb)	Frequency of Contribution	Relative Amount (% of total manmade ppb ≥ 85 ppb (8-hr)
Illinois:				
UAM-V	3	-	2 ppb to 3% of exceedances	3
CAMx	8	5	2 ppb to 37% of exceedances 5 ppb to 10% of exceedances	2
Indiana:				
UAM-V	3	-	2 ppb to 4% of exceedances	3
CAMx	8	-	2 ppb to 34% of exceedances	2
Kentucky:				
UAM-V	4	-	2 ppb to 7% of exceedances	3
CAMx	8	7	-	2
Maryland/DC/Delaware:				
CAMx	71	31	10 ppb to 60% of exceedances	20
Michigan:				
UAM-V	7	-	2 ppb to 11% of exceedances	4
CAMx	10	7	2 ppb to 35% of exceedances 5 ppb to 9% of exceedances	2
North Carolina:				
UAM-V	18	-	2 ppb to 9% of exceedances 5 ppb to 3% of exceedances	4
CAMx	25	7	2 ppb to 11% of exceedances 5 ppb to 4% of exceedances	3
New York:				
CAMx	24	22	2 ppb to 7% of exceedances	25 (on that highest day)
Ohio:				
UAM-V	9	-	2 ppb to 38% of exceedances 5 ppb to 5% of exceedances	10
CAMx	17	6	2 ppb to 39% of exceedances 5 ppb to 11% of exceedances	12 (on that highest day)
Pennsylvania:				
CAMx	62	31	10 ppb to 71% of exceedances	26
Virginia:				
UAM-V	32	-	5 ppb to 22% of exceedances	19
CAMx	38	20	10 ppb to 27% of exceedances	9
West Virginia:				
UAM-V	15	-	5 ppb to 37% of exceedances 10 ppb to 11% of exceedances	18
CAMx	16	9	2 ppb to 39% of exceedances 5 ppb to 11% of exceedances	5

1. This table was compiled using Appendix D in the United States Environmental Protection Agency's report entitled, "Air Quality Modeling Technical Support Document for the Regional NO_x SIP Call," September 23, 1998.
2. 8-ozone nonattainment is only presented in this table because New Jersey was not modeled as a separate nonattainment area for 1-hour ozone. It was a part of the Philadelphia and New York City nonattainment areas.

Table E13: Percent Contribution from Upwind States to 8-Hour Nonattainment in New Jersey based upon the NO_x SIP Call Modeling Analyses

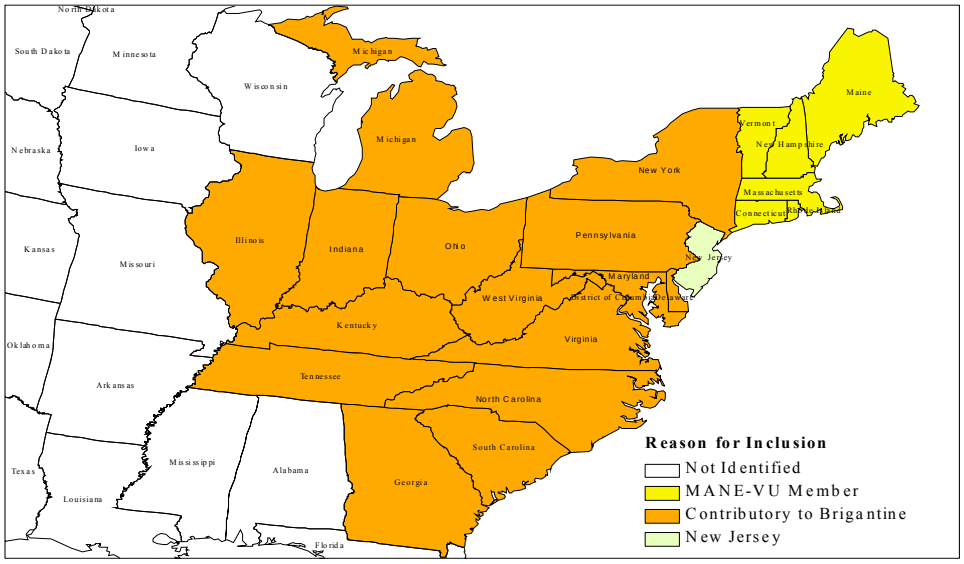
Downwind Area: **New Jersey**	Percent of Total Manmade Emissions Over 4 Episodes[1]	Highest Single-Episode Percent Contribution[2]
Amount due to "Local" Emissions[3]	15	21
Total Amount from all "Upwind" States	85	NA[4]
Contributions from Individual Upwind States		
PA	26	32
MD/DC/DE	20	22
VA	9	11
OH	6	7
WV	5	8
NC	3	4
IL	2	3
IN	2	4
KY	2	4
MI	2	4
AL	1	1
GA	1	1
MO	1	2
NY	1	1
TN	1	2
WI	1	1
Total Amount from All Other States, combined	2	NA

1. These values are based on CAMx Metric 3 calculated across all 4 episodes.
2. These values are based on CAMX Metric 3 calculated for episode individually. These values do not add up to 100 percent.
3. Total contribution from the State listed.
4. Not applicable.

Regional Haze Modeling Analysis

In New Jersey's Regional Haze SIP, states were identified as contributing to visibility impairment to New Jersey's Class I area, based on the MANE-VU assessment discussed previously, which used a combination of several techniques or based on their involvement in the MANE-VU Planning Organization. A summary of the states identified using these methods is shown in Figure E5.

Figure E5: States Identified as Contributing to Visibility Impairment in New Jersey's Class I Area



The regional assessment performed for MANE-VU by NESCAUM, as well as other analyses used in New Jersey's regional haze plan, concluded that sulfates were the predominant pollutant responsible for causing visibility impairment in the Northeastern United States in the period, 2000 - 2004.[41] Sulfur dioxide, the primary precursor for $PM_{2.5}$, is the primary precursor pollutant for sulfate particles. Sulfate particles commonly account for more than 50 percent of particle-related light extinction at northeastern Class I areas on the clearest days and for as much as or more than 80 percent on the haziest days.[42]

The NESCAUM Assessment used the Eulerian grid model, REMSAD, as one of the methods in the assessment. This type of model is likely to yield a more definitive assessment of contribution from different sources. Eulerian or "grid" models strive to provide a comprehensive accounting of the impacts from the emissions by considering the meteorological dynamics, chemical production, transformation, and destruction as well as wet and dry deposition and microphysical processes. With this degree of sophistication also comes attendant uncertainty, thus the

[41] NJDEP. State Implementation Plan (SIP) for Regional Haze, Final. New Jersey Department of Environmental Protection, July 2009.

[42] NESCAUM. Contributions to Regional Haze in the Northeast and Mid-Atlantic: Mid-Atlantic/Northeast Visibility Union (MANE-VU) Contribution Assessment United States. Prepared by Northeast States for Coordinated Air Use Management (NESCAUM) for the Mid-Atlantic/Northeast Visibility Union (MANE-VU), August 2006.

consideration of more than one analysis system. REMSAD was used with a 12 kilometer grid in the eastern United States domain. The air quality was modeled using 22 vertical layers with hourly temporal resolution for the entire calendar year 2002. REMSAD has simplified chemistry but allows for emissions tracking of sulfate, nitrate, and mercury through a tagging feature that calculates the contribution of specific sources to ambient concentrations, visibility impacts, and wet or dry deposition. REMSAD model was used primarily for attribution of sulfate species in the Eastern United States via the species-tagging scheme included in Version 7.10 and newer versions of the model. Sulfate is the focus of the regional haze plan for the first milestone period year (2018) in the MANE-VU Class I states.

The left side of Figure E6 presents the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitored data by species for 2000-2004 (the baseline years), the center provides the REMSAD modeling results for 2002 indicating the contributions of the measured sulfate concentrations by states and regions, and, on the right, three maps indicating meeting the following criteria:

1. States/regions that contributed 0.1 µg/m^3 sulfate or greater on the 20 percent worst visibility days in the base year (2002).
2. States/regions that contributed at least 2 percent of total sulfate observed on 20 percent worst visibility days in 2002.
3. The top ten contributing states on the 20 percent worst visibility days in 2002.

<u>Figure E6</u>: Modeled 2002 Contributions to Sulfate by State and Canada at Brigantine

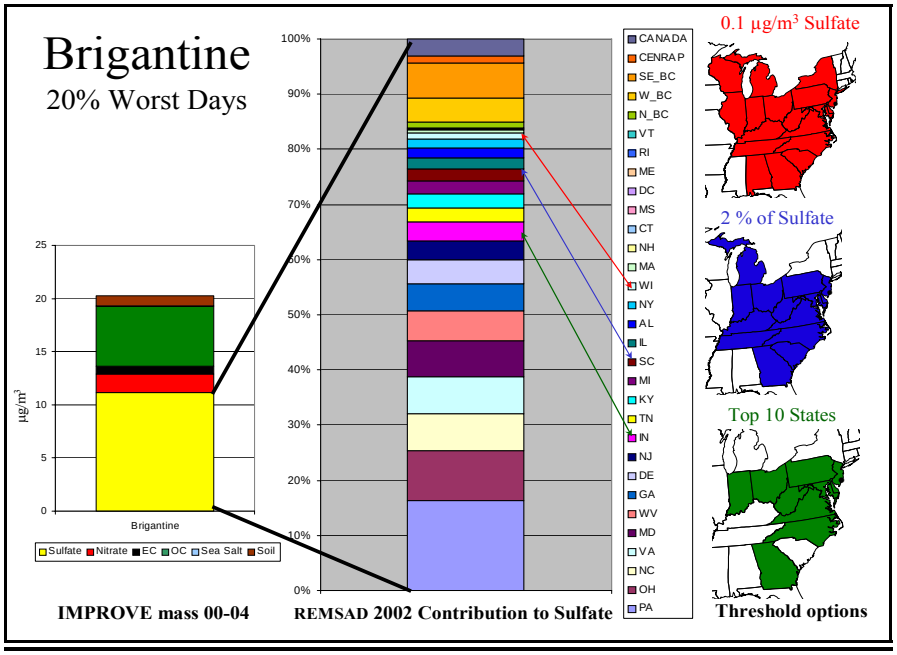
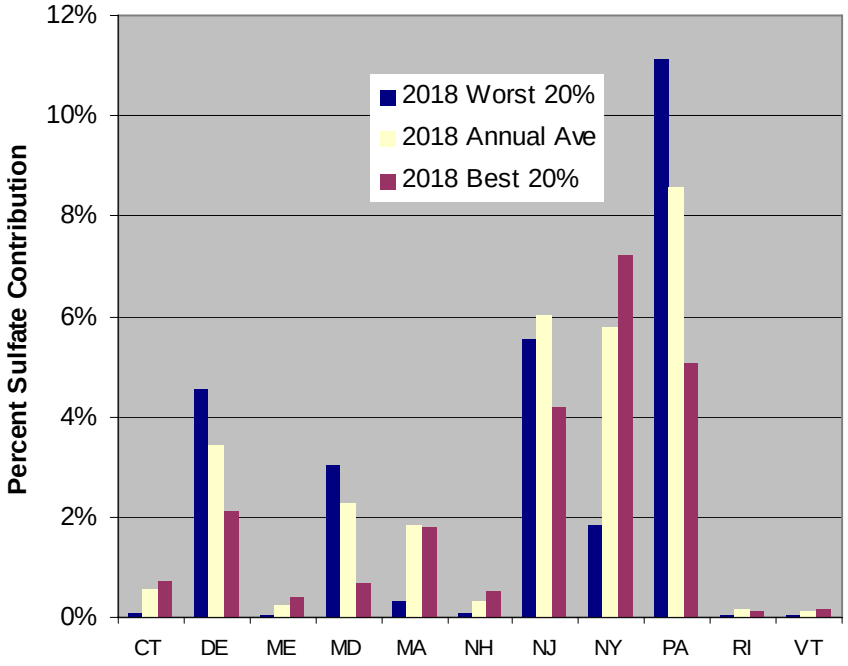


Figure E7 demonstrates the 2018 REMSAD modeled results of sulfate contributions to Brigantine by the MANE-VU states. The graph compares the contributions on the 20 percent best and worst visibility days to the annual average sulfate concentration. The main contributory states besides New Jersey in this comparison are Pennsylvania, New York, and Delaware.

Figure E7: Modeled 2018 Percent Sulfate Contributions by MANE-VU State at Brigantine



For the purposes of deciding how broadly to consult to achieve visibility goals, the MANE-VU States settled on the following criteria: any state/region that contributed at least 2 percent of total sulfate observed on the 20 percent worst visibility days in 2002 was defined as a "contributor" to visibility impairment (see Figure E6). Connecticut, Rhode Island, Vermont, and the District of Columbia were not identified as being among the political or regional units contributing at least 2 percent of sulfate at any of the seven Class I areas. However, as participants in MANE-VU, those entities have agreed to pursue adoption of regional control measures aimed at visibility improvement on the haziest days and prevention of visibility degradation on the clearest days. For the purposes of achieving visibility goals, this is why MANE-VU states identified other MANE-VU states that did not contribute the 2 percent as contributing to them as MANE-VU members but New Jersey did not include these states as significant contributors to the nonattainment or maintenance of the 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ NAAQS, according to 42 U.S.C. § 7410(a)(2)(D)(i) (Section 110(a)(2)(D))(i).

State Collaborative Analysis

The State Collaborative modeling analyses for $PM_{2.5}$ showed significant contributions from other states on $PM_{2.5}$ concentrations in the Northern New Jersey/New York/Connecticut nonattainment area for 2005 (see Appendix D). The criteria for significance used was equivalent to 1 percent of the standard, as discussed above. Table E14 lists both the annual and 24-hour concentrations associated with other states and areas that contribute to the Northern New Jersey/New York/Connecticut nonattainment area. There are 14 geographical areas that contribute to nonattainment for both the 24-hour and annual $PM_{2.5}$ standards.

Table E14: Contributions to Annual and 24-Hour Fine Particulate Matter in the Northern New Jersey/New York/Connecticut Nonattainment Area Demonstrated by the State Collaborative Modeling Analysis for 2005

Contributing Area	24-Hour $PM_{2.5}$ Contribution ($\geq$0.35 $\mu g/m^3$)	Annual $PM_{2.5}$ Contribution ($\geq$0.15 $\mu g/m^3$)
Indiana	0.63	0.19
Ohio	1.31	0.47
Michigan	0.47	0.32
North Carolina	0.78	0.19
Virginia	1.34	0.30
West Virginia	0.61	0.17
Maryland_DC	1.21	0.28
Delaware	0.62	0.25
Pennsylvania	5.43	1.98
New Jersey	15.82	6.07
New York	5.38	2.20
Connecticut_Rhode Island	0.89	0.20
Massachusetts	0.98	0.25
Canada	0.60	0.44
Illinois	0.42	NS[1]
CENRAP[2]_WRAP[3]_South	0.37	NS[1]
Kentucky	0.47	NS[1]

1. NS = Not significant.
2. CENRAP = Central Regional Air Planning Association. CENRAP is an organization of states, tribes, federal agencies. The states included are Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana.
3. WRAP = Western Regional Air Partnership. The WRAP is made up of western states, tribes, and federal agencies. The states are Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

Conclusion for Other States' Significant Impacts on New Jersey

The four modeling analyses applied in addressing other states' significant contributions to New Jersey's 24-hour $PM_{2.5}$ NAAQS represent a weight-of-evidence approach, using the best data available.

The results from the four different analyses summarized in Table E15 show that these states significantly contribute to New Jersey's $PM_{2.5}$ nonattainment in its thirteen (13) counties designated as not attaining the 35 $\mu g/m^3$ 24-hour (2006) $PM_{2.5}$ NAAQS and interfere with the maintenance of attainment in the remaining eight (8) counties.

Table E15: Summary of Significant Contributions from Other States' to New Jersey's Fine Particulate Matter Nonattainment and Maintenance by Analysis

Analysis	$PM_{2.5}$ CAIR Modeling	8-Hour Ozone CAIR Modeling	NO_x SIP Call Modeling	Regional Haze Modeling[1]	State Collaborative Modeling	Significant Contribution? (Y/N)
State(s)/Area(s)	**NJ Only**	**NJ Only**	**NJ Only**	**NJ Only**	**NNJ/NY/CT[2]**	
Canada					x	Y
CENRAP[3]_WRAP[4]_South					x	Y
Connecticut					x (combined with Rhode Island)	Y
Delaware		x	x	x	x	Y
District of Columbia			x			Y
Georgia				x		Y
Illinois			x	x	x	Y
Indiana			x	x	x	Y
Kentucky			x	x	x	Y
Maryland	x (combined with D.C.)	x (combined with D.C.)	x	x	x (combined with D.C.)	Y
Massachusetts					x	Y
Michigan	x	x	x	x	x	Y
New York	x	x	x	x	x	Y
North Carolina			x	x	x	Y
Ohio	x	x	x	x	x	Y
Pennsylvania	x	x	x	x	x	Y
South Carolina				x		Y
Tennessee				x		Y
Virginia	x	x	x	x	x	Y
West Virginia	x	x	x	x	x	Y

1. Contributing states included those with a sulfate contribution >2%; Illinois and New York are also included based upon other modeling techniques (see New Jersey's Regional Haze SIP).
2. Northern New Jersey/New York/Connecticut nonattainment area
3. CENRAP = Central Regional Air Planning Association. CENRAP is an organization of states, tribes, federal agencies. The states included are Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Missouri, Arkansas, and Louisiana.
4. WRAP = Western Regional Air Partnership. The WRAP is made up of western states, tribes, and federal agencies. The states are Alaska, Arizona, California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

New Jersey requests that the USEPA, when it evaluates the SIPs from these states, ensure that they are not hindering the attainment and maintenance of the $PM_{2.5}$ NAAQS in New Jersey or in the multi-state nonattainment areas. With regard to regional haze, New Jersey expects that the USEPA and the Federal Land Managers (FLMs) will monitor and ensure the emission reductions from the contributing states to achieve the 2018 reasonable progress goals set for the Brigantine Wilderness Area. As discussed in detail in Appendix D, New Jersey requests that the USEPA consider recommendations made by the State Collaborative and the OTC as the USEPA develops a replacement rule for the CAIR.