BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	**)**	
	)	
SECTION 27 PROPOSED RULES FOR	**)**	
NITROGEN OXIDE (NO_x) EMISSIONS	**)**	**R07-19**
FROM STATIONARY RECIPROCATING	**)**	**(Rulemaking – Air)**
INTERNAL COMBUSTION ENGINES AND	**)**	
TURBINES: AMENDMENTS TO 35 ILL.	**)**	
ADM. CODE PARTS 211 AND 217	**)**	

NOTICE

TO:

John Therriault, Assistant Clerk
Illinois Pollution Control Board
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601

SEE ATTACHED SERVICE LIST

PLEASE TAKE NOTICE that I have today filed with the Office of the Pollution Control Board the attached MOTION TO PROCEED WITH AMENDED PROPOSAL AND WITHDRAW TESTIMONY of the Illinois Environmental Protection Agency a copy of which is herewith served upon you.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

By: /s/
Rachel L. Doctors
Assistant Counsel
Division of Legal Counsel

DATED: December 20, 2007
P.O. Box 19276
Springfield, Illinois 62794-9276
217.782-5544
217.782.9143 (TDD)

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	**)**	
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SECTION 27 PROPOSED RULES FOR	**)**	
NITROGEN OXIDE (NO_x) EMISSIONS	**)**	**R07-19**
FROM STATIONARY RECIPROCATING	**)**	**(Rulemaking – Air)**
INTERNAL COMBUSTION ENGINES AND	**)**	
TURBINES: AMENDMENTS TO 35 ILL.	**)**	
ADM. CODE SECTION 201.146	**)**	
AND PART 217	**)**	

MOTION TO PROCEED WITH AMENDED PROPOSAL AND WITHDRAW TESTIMONY

NOW COMES the Illinois Environmental Protection Agency ("Illinois EPA"), by one of its attorneys and, pursuant to 35 Ill. Adm. Code 101.502 and 102.402, moves, with the clarifications explained below, that the Hearing Officer proceed with scheduling hearings on the above rulemaking. Proceeding with R07-19 will, in part, satisfy Illinois' obligation to meet the Clean Air Act's ("CAA") requirement under the 8-hour National Ambient Air Quality Standard ("NAAQS") for nitrogen oxides ("NO_x") reasonably available control technology ("RACT") and would further improve air quality with respect to particulate mater by reducing the precursors for fine particulate ("$PM_{2.5}$"). The Illinois EPA also moves that testimony submitted prior to the Illinois Pollution Control Board's ("Board") split of the original docket be withdrawn. In support of its Motion, the Illinois EPA respectfully states as follows:

1. On March 29, 2007, the Illinois EPA filed a proposal to control NO_x from engines and turbines statewide. Its proposal included statewide NO_x emissions control requirements based on the capacity of the engine or turbine, as well as any engine that had been identified by the United States Environmental Protection Agency ("USEPA") as a large engine under the NO_x State Implementation Plan ("SIP") Call.

2. On May 17, 2007, the Board bifurcated the proceeding into two dockets: R07-18 (NO_x SIP Call engines) and R07-19 (engines and turbines statewide). The entire original proposal, R07-18, went to First Notice on May 4, 2007. 31 Ill. Reg. 6597. On June 8, 2007, the new docket for engines and turbines statewide, R07-19, went to First Notice. 31 Ill. Reg. 7702.

3. On August 23, 2007, the Illinois EPA filed a Motion requesting that R07-19 be held until new modeling based on a revised emissions inventory was completed and the results of such modeling were shared with the interested parties to this rulemaking. This Motion was granted on August 27, 2007.

4. On September 20, 2007, the Board fully adopted R07-18. The present rulemaking docket would amend 35 Ill. Adm. Code 217, Subpart Q, but would not change the substantive elements as they apply to NO_x SIP Call engines.

5. On October 4, 2007, the Illinois EPA shared the new modeling results with interested parties. Based on the results of the new modeling, and in light of the adoption of docket R07-18, the Illinois EPA has determined that proceeding with this rulemaking in the context of the present docket would best serve all parties in terms of expeditiously achieving a final rulemaking to address sources that remain of concern. Therefore, the Illinois EPA's plan is to continue controlling NO_x emissions from engines listed in Appendix G (as adopted in R07-18), and to propose to control NO_x emissions from engines and turbines located at 100 ton per year sources ("RACT units") in either the greater Chicago nonattainment or Metro-East/St. Louis nonattainment areas based on the originally proposed capacity thresholds.[1]

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[1] The greater Chicago nonattainment area, for purposes of the 8-hour ozone and $PM_{2.5}$ NAAQS, consists of the following counties and partial counties: Cook, DuPage, Grundy (Aux Sable and Goose Lake Townships only), Kane, Kendall (Oswego Township only), Lake, McHenry, and Will. The Metro-East/St. Louis 8-hour ozone nonattainment area consists of the following counties: Jersey, Madison, Monroe, and St. Clair. For purses of $PM_{2.5}$, the Metro-East/St. Louis nonattainment area consists of the following counties and partial counties: Madison, Monroe, Randolph (Baldwin Township only) and St. Clair. For the purposes of this proposal, a combined 8-hour

6. The attached draft of the proposed regulations (Att. A) differs from the version published on May 4, 2007, as follows:

a) Control requirements are limited to engines or turbines located at a 100 ton per year source in the Greater Chicago or Metro-East/St. Louis areas with a capacity of 500 bhp or 3.5 MW, respectively;

b) A new compliance date of May 1, 2010, for RACT units has been added;

c) The exemption for Subpart W units is being deleted because the requirements for the Clean Air Interstate Rule that replaces those requirements is not equivalent to RACT;

d) Two additions to the emissions averaging plan compliance option have been added. First, sources that contain RACT units in addition to engines and turbines may include the engines and turbines in an emissions averaging plan adopted to address these other types of RACT units. Second, owners or operators with affected engines and turbines located at more than one source within a given nonattainment area may develop a companywide emissions averaging plan for the given nonattainment area;

e) A clarification has been made that testing and monitoring do not apply to low usage units; and

f) The definition for emergency/standby unit is being amended to allow for 50 hours of nonemergency use. This change is consistent with a similar definition that applies to maximum achievable control technology units.

7. The Illinois EPA is filing an amended Technical Support Document ("TSD") that reflects changes in the items listed below and is requesting that the TSD filed with the original proposal (R07-18) be withdrawn from the docket. While the Illinois EPA is not filing an amended Statement of Reasons, it requests that where the items listed below are discussed in that document, and differ from the discussion in the amended TSD, the facts in the amended TSD should be the facts relied upon.

a) Geographic scope of the amended proposal is now limited to the greater Chicago and Metro-East/St. Louis areas;

$PM_{2.5}$ nonattainment area is being proposed for applicability of Jersey, Madison, Monroe, Randolph (Baldwin Township only) and St. Clair Counties.

b) A smaller emissions inventory is now included;

c) Fewer emissions reductions and lower costs are projected, as fewer units are subject to control requirements;

d) RACT is not necessarily required for $PM_{2.5}$ nonattainment areas; and

e) USEPA adopted final guidance for implementing the $PM_{2.5}$ NAAQS. This replaces ref. 29 in the original TSD, and is numbered 5 in the amended TSD. (Att. F).

8. The purpose of this motion is to provide the Board and all interested parties with all requisite revised or substituted language to adapt docket R07-19 as was "created" by the Board to fit the Illinois EPA's current approach. Attached to this motion are amended regulatory language based on Subpart Q as adopted in R07-18 (Att. A), an amended TSD (Att. B), economic and budgetary forms for Parts 201, 211, and 217 (Atts. C, D and E), and a new TSD reference 5 (an update of old Ref. 29) (Att. F). The amended language includes the clarifications discussed in paragraph 6 above. Attachment A was shared with interested parties on December 2, 2007.

9. The compliance date and averaging provisions are consistent with the Illinois EPA's plans with respect to control of other NO_x RACT sources. Illinois is required under the CAA to implement NO_x RACT for 8-hour ozone in 2009. The Illinois EPA is proposing to give sources more time to implement this requirement, as the rule is not yet adopted.

10. The Illinois EPA requests that a conference call be held with the interested parties and the Hearing Officer to determine convenient hearing dates for R07-19.

11. The Illinois EPA requests that all the testimony submitted in support of the original proposal (R07-18) on May 11, 2007, and subsequently included by the Board on the docket for this rulemaking, be withdrawn as the basis and scope of this regulatory proposal is significantly narrower with the adoption of R07-18 and the limited geographic applicability. The

Illinois EPA only plans to have two witnesses testify at hearing in this rulemaking proceeding. The Illinois EPA suggests that it be allowed to submit prefiled testimony 14 days before a scheduled hearing. The Illinois EPA's witnesses, Yoginder Mahajan and Robert Kaleel, would be available for direct testimony and questioning.

WHERFORE, for the reasons stated above, the Illinois EPA respectfully requests that the Hearing Officer grant the Illinois EPA's Motion to Proceed with an Amended Proposal and Withdraw Testimony.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: ___/s/_____
Rachel L. Doctors
Assistant Counsel
Air Regulatory Unit
Division of Legal Counsel

DATED: December 20, 2007

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

STATE OF ILLINOIS	**)**	
	)	**SS**
COUNTY OF SANGAMON	**)**	
	)	

CERTIFICATE OF SERVICE

I, the undersigned, an attorney, state that I have served electronically the attached MOTION TO PROCEED WITH AMENDED PROPOSAL AND WITHDRAW TESTIMONY of the Illinois Environmental Protection Agency upon the following persons:

John Therriault, Assistant Clerk
Illinois Pollution Control Board
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601

SEE ATTACHED SERVICE LIST

and by electronic service from Springfield, Illinois on December 20, 2007.

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

___/s/_____
Rachel L. Doctors
Assistant Counsel
Air Regulatory Unit
Division of Legal Counsel

Dated: December 20, 2007

1021 North Grand Avenue East
Springfield, Illinois 62794-9276
(217) 782-5544
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R07-19 Service List

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R07-19

SUBPART Q: STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES AND TURBINES

Section 217.386 Applicability

a) The provisions of this Subpart shall apply to all:

1) ~~A stationary~~ Stationary reciprocating internal combustion engines ~~engine~~ listed in Appendix G of this Part ~~is subject to the requirements of this Subpart Q~~.

2) Stationary reciprocating internal combustion engines and turbines located at a source that emits or has the potential it emit NO_x in an amount equal to or greater than 100 tons per year and is in either the area composed of the Chicago area counties of Cook, DuPage, Kane, Lake, McHenry, and Will, the Townships of Aux Sable and Goose Lake in Grundy County, and the Township of Oswego in Kendall County, or in the area composed of the Metro-East counties of Jersey, Madison, Monroe, and St. Clair, and the Township of Baldwin in Randolph County, where:

A) The engine at nameplate capacity is rated at equal to or greater than 500 bhp output; or

B) The turbine is rated at equal to or greater than 3.5 MW (4,694 bhp) output at 14.7 psia, 59ºF and 60 percent relative humidity.

b) Notwithstanding subsection (a) of this Section, an affected unit is not subject to the requirements of this Subpart Q if the engine or turbine is or has been:

1) Used as an emergency or standby unit as defined by 35 Ill. Adm. Code 211.1920;

2) Used for research or for the purposes of performance verification or testing;

3) Used to control emissions from landfills, where at least 50 percent of the heat input is gas collected from a landfill;

4) Used for agricultural purposes including the raising of crops or livestock that are produced on site, but not for associated businesses like packing operations, sale of equipment or repair; or

5) An engine with nameplate capacity rated at less than 1,500 bhp (1,118kW) output, mounted on a chassis or skids, designed to be moveable, and moved to a different source at least once every 12 months;

c) If an exempt unit ceases to fulfill the criteria specified in subsection (b) of this Section, the owner or operator must notify the Agency in writing within 30 days after becoming aware that the exemption no longer applies and comply with the control requirements of this Subpart Q.

d) The requirements of this Subpart Q will continue to apply to any engine or turbine that has ever been subject to the control requirements of Section 217.388, even if the affected unit or source ceases to fulfill the rating requirements of subsection (a) of this Section or becomes eligible for an exemption pursuant to subsection (b) of this Section.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 217.388 Control and Maintenance Requirements

On and after the applicable compliance date in Section 217.392, an owner or operator of an affected unit must inspect and maintain affected units as required by subsection (c) of this Section and comply with either the applicable emissions concentration as set forth in subsection (a) of this Section, or the requirements for an emissions averaging plan as specified in subsection (b) of this Section, or the requirements for operation as a low usage unit as specified in subsection (d) of this Section.

a) The owner or operator ~~must~~ limits the discharge from an affected unit into the atmosphere of any gases that contain NO_x to no more than:

1) 150 ppmv (corrected to 15 percent O_2 on a dry basis) for spark-ignited rich-burn engines;

2) 210 ppmv (corrected to 15 percent O_2 on a dry basis) for spark-ignited lean-burn engines, except for existing spark-ignited Worthington engines that are not listed in Appendix G;

3) 365 ppmv (corrected to 15 percent O_2 on a dry basis) for existing spark-ignited Worthington engines that are not listed in Appendix G;

4) 660 ppmv (corrected to 15 percent O_2 on a dry basis) for diesel engines;

5) 42 ppmv (corrected to 15 percent O_2 on a dry basis) for gaseous fuel-fired turbines; and

6) 96 ppmv (corrected to 15 percent O_2 on a dry basis) for liquid fuel-fired turbines.

b) The owner or operator ~~must~~ complies~~y~~ with an emissions averaging plan as

provided for in either subsection (b)(1) or (b)(2) of this Section:

1) For any affected unit identified by Section 217.386: The ~~the~~ requirements of the applicable emissions averaging plan as set forth in Section 217.390; or

2) For units identified in Section 217.386(a)(2): The requirements of an emissions averaging plan adopted pursuant to any other Subpart of this Part. For such affected engines and turbines the applicable requirements of this Subpart apply, including but not limited to, calculation of NO_x allowable and actual emissions rates, compliance dates, monitoring, testing, reporting, and recordkeeping.

c) The owner or operator operates the affected unit as a low usage unit pursuant to subsection (c)(1) or (c)(2) of this Section. Low usage units are not subject to the requirements of this Subpart Q except for the requirements to inspect and maintain the unit pursuant to subsection (d) of this Section, and retain records pursuant to Sections 217.396(b) and (d). Either the limitation in subsection (c)(1) or (c)(2) may be utilized at a source, but not both:

1) The potential to emit (PTE) is no more than 100 TPY NO_x aggregated from all engines and turbines located at the source that are not otherwise exempt pursuant to Section 217.386(b), and not complying with the requirements of subsection (a) or (b) of this Section, and the NO_x PTE limit is contained in a federally enforceable permit; or

2) The aggregate bhp-hrs/MW-hrs from all affected units located at the source that are not exempt pursuant to Section 217.386(b), and not complying with the requirements of subsection (a) or (b) of this Section, are less than or equal to the bhp-hrs and MW-hrs operation limit listed in subsection (c)(2)(A) and (c)(2)(B) of this Section. For units that drive a natural gas compressor station but that are not located at a natural gas compressor station or storage facility, the operation limits of subsection (c)(2)(A) and (c)(2)(B) of this Section must be contained in a federally enforceable permit. The operation limits are:

A) 8 mm bhp-hrs or less on an annual basis for engines; and

B) 20,000 MW-hrs or less on an annual basis for turbines.

d) The owner or operator ~~must~~ inspects and performs periodic maintenance on the affected unit, in accordance with a Maintenance Plan that documents:

1) For a unit not located at natural gas transmission compressor station or storage facility either:

A) The manufacturer's recommended inspection and maintenance of the applicable air pollution control equipment, monitoring device, and affected unit; or

B) If the original equipment manual is not available or substantial modifications have been made that require an alternative procedure for the applicable air pollution control device, monitoring device, or affected unit, the owner or operator must establish a plan for inspection and maintenance in accordance with what is customary for the type of air pollution control equipment, monitoring device, and affected unit.

2) For a unit located at a natural gas compressor station or storage facility, the operator's maintenance procedures for the applicable air pollution control device, monitoring device, and affected unit.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 217.390 Emissions Averaging Plans

a) An owner or operator of certain affected units may comply through an emissions averaging plan.

1) The unit or units that commenced operation before January 1, 2002, may be included in only one~~an~~ emissions averaging plan, as follows:

A) The ~~the~~units:

i) Listed in Appendix G and located at a single source or at multiple sources in Illinois, so long as the units are owned by the same company or parent company where the parent company has working control through stock ownership of its subsidiary corporations. ~~A unit may be listed in only one emissions averaging plan~~; or

ii) Identified in Section 217.386(b)(2), and located at a single source or at multiple sources in either the Chicago area counties or Metro-East area counties, so long as the units are owned by the same company or parent company where the parent company has working control through stock ownership of its subsidiary corporations.

B) Units that have a compliance date later than the control period for which the averaging plan is being used for compliance; and

C) Units which the owner or operator may claim as exempt pursuant to Section 217.386(b) but does not claim as exempt. For as long as such unit is included in an emissions averaging plan, it will be treated as an affected unit and subject to the applicable emission concentration, limits, testing, monitoring, recordkeeping and reporting requirements.

2) The following types of units may not be included in an emissions averaging plan:

A) Units ~~units~~ that commence operation after January 1, 2002, unless the unit replaces an engine or turbine that commenced operation on or before January 1, 2002, or it replaces an engine or turbine that replaced a unit that commenced operation on or before January 1, 2002. The new unit must be used for the same purpose as the replacement unit. The owner or operator of a unit that is shutdown and replaced must comply with the provisions of Section 217.396(c)(3) before the replacement unit may be included in an emissions averaging plan.

B) Units which the owner or operator is claiming are exempt pursuant to Section 217.386(b) or as low usage units pursuant to Section 217.388(c).

b) An owner or operator must submit an emissions averaging plan to the Agency by the applicable compliance date set forth in Section 217.392. The plan must include, but is not limited to:

1) The list of affected units included in the plan by unit identification number and permit number.

2) A sample calculation demonstrating compliance using the methodology provided in subsection (f) of this Section for both the ozone season and calendar year.

c) An owner or operator may amend an emissions averaging plan only once per calendar year. An amended plan must be submitted to the Agency by May 1 of the applicable calendar year. If an amended plan is not received by the Agency by May 1 of the applicable calendar year, the previous year's plan will be the applicable emissions averaging plan.

d) Notwithstanding subsection (c) of this Section, an owner or operator, and the buyer, if applicable:~~, must~~

1) Must submit an updated emissions averaging plan or plans to the Agency within 60 days, if a unit that is listed in an emissions averaging plan is sold or taken out of service.

2) May amend its emissions averaging plan to include another unit within 30 days of discovering that the unit no longer qualifies as an exempt unit pursuant to Section 217.386(b) or as a low usage unit pursuant to Section 217.388(c).

e) An owner or operator must:

1) Demonstrate compliance for both the ozone season (May 1 through September 30) and the calendar year (January 1 through December 31) by using the methodology and the units listed in the most recent emissions averaging plan submitted to the Agency pursuant to subsection (b), (c), or (d) of this Section; the higher of the monitoring or test data determined pursuant to Section 217.394; and the actual hours of operation for the applicable control period;

2) Notify the Agency by October 31 following the ozone season, if compliance cannot be demonstrated for that ozone season; and

3) Submit to the Agency by January 31 following each calendar year, a compliance report containing the information required by Section 217.396(c)(4).

f) The total mass of actual NO_x emissions from the units listed in the emissions averaging plan must be equal to or less than the total mass of allowable NO_x emissions for those units for both the ozone season and calendar year. The following equation must be used to determine compliance:

$N_{act} \leq N_{all}$

Where:

$N_{act} = \sum_{i=1}^{n} EM_{act(i)}$

$N_{all} = \sum_{i=1}^{n} EM_{all(i)}$

N_{act} = Total sum of the actual NO_x mass emissions from units included in the averaging plan for each fuel used (lbs per ozone season and calendar year).

N_{all} = Total sum of the allowable NO_x mass emissions from units included in the averaging plan for each fuel used (lbs per ozone season and calendar year).

$EM_{all(i)}$ = Total mass of allowable NO_x emissions in lbs for a unit as determined in subsection (g)(2) or (h)(2) of this Section.

$EM_{act(i)}$ = Total mass of actual NO_x emissions in lbs for a unit as determined in subsection (g)(1) or (h)(1) of this Section.

i = Subscript denoting an individual unit and fuel used.

n = Number of different units in the averaging plan.

g) For each unit in the averaging plan, and each fuel used by a unit, determine actual and allowable NO_x emissions using the following equations, except as provided for in subsection (h) of this Section:

1) Actual emissions must be determined as follows:

$$EM_{act(i)} = E_{act(i)} \times H_i$$

$$E_{act(i)} = \frac{\sum_{j=1}^{m} C_{d(act(j))} x F_d x \left(\frac{20.9}{20.9 - \%O_{2d(j)}} \right)}{m}$$

2) Allowable emissions must be determined as follows:

$$EM_{all(i)} = E_{all(i)} \times H_i$$

$$E_{all(i)} = \frac{\sum_{j=1}^{m} C_{d(all)} x F_d x \left(\frac{20.9}{20.9 - \%O_{2d(j)}} \right)}{m}$$

Where:

$EM_{act(i)}$ = Total mass of actual NO_x emissions in lbs for a unit, except as provided for in subsections (g)(3) and (g)(5) of this Section.

$EM_{all(i)}$ = Total mass of allowable NO_x emissions in lbs for a unit, except as provided for in subsection (g)(3) of this Section.

E_{act} = Actual NO_x emission rate (lbs/mmBtu) calculated according to the above equation.

E_{all} = Allowable NO_x emission rate (lbs/mmBtu) calculated according to the above equation.

H = Heat input (mmBtu/ozone season or mmBtu/year) calculated from fuel flow meter and the heating value of the fuel used.

$C_{d(act)}$ = Actual concentration of NO_x in lb/dscf (ppmv x 1.194×10^{-7}) on a dry basis for the fuel used. Actual concentration is determined on each of the most recent test

run or monitoring pass performed pursuant to Section 217.394, whichever is higher.

$C_{d(all)}$ = Allowable concentration of NO_x in lb/dscf (allowable emission limit in ppmv specified in Section 217.388(a), except as provided for in subsection (g)(4), (g)(5), or (g)(6) of this Section, if applicable, (multiplied by 1.194×10^{-7}) on a dry basis for the fuel used.

F_d = The ratio of the gas volume of the products of combustion to the heat content of the fuel (dscf/mmBtu) as given in the table of F Factors included in 40 CFR 60, Appendix A, Method 19 or as determined using 40 CFR 60, Appendix A, Method 19.

$\%O_{2d}$ = Concentration of oxygen in effluent gas stream measured on a dry basis during each of the applicable test or monitoring runs used for determining emissions, as represented by a whole number percent, e.g., for $18.7\%O_{2d}$, 18.7 would be used.

i = Subscript denoting an individual unit and the fuel used.

j = Subscript denoting each test run or monitoring pass for an affected unit for a given fuel.

m = The number of test runs or monitoring passes for an affected unit using a given fuel.

3) For a replacement unit that is electric-powered, the allowable NO_x emissions from the affected unit that was replaced should be used in the averaging calculations and the actual NO_x emissions for the electric-powered replacement unit ($EM_{(i)act\ elec}$) are zero. Allowable NO_x emissions for the electric-powered replacement are calculated using the actual total bhp-hrs generated by the electric-powered replacement unit on an ozone season and on an annual basis multiplied by the allowable NO_x emission rate in lb/bhp-hr of the replaced unit. The allowable mass of NO_x emissions from an electric-powered replacement unit ($EM_{(i)all\ elec}$) must be determined by multiplying the nameplate capacity of the unit by the hours operated during the ozone season or annually and the allowable NO_x emission rate of the replaced unit ($E_{all\ rep}$) in lb/mmBtu converted to lb/bhp-hr. For this calculation the following equation should be used:

$$EM_{all\ elec(i)} = bhp \times OP \times F \times E_{all\ rep(i)}$$

Where:

$EM_{all\ elec(i)}$ = Mass of allowable NO_x emissions from the electric-powered replacement unit in pounds per ozone season or calendar year.

bhp = Nameplate capacity of the electric-powered

replacement unit in brake-horsepower.

OP = Operating hours during the ozone season or calendar year.

F = Conversion factor of 0.0077 mmBtu/bhp-hr.

$E_{all\ rep(i)}$ = Allowable NO_X emission rate (lbs/mmBtu) of the replaced unit.

i = Subscript denoting an individual electric unit and the fuel used.

4) For a replacement unit that is not electric, the allowable NO_x emissions rate used in the above equations set forth in subsection (g)(2) of this Section must be the higher of the actual NO_x emissions as determined by testing or monitoring data or the applicable uncontrolled NO_x emissions factor from Compilation of Air pollutant emission Factors: AP-42, Volume I: Stationary Point and Area Sources, as incorporated by reference in Section 217.104 for the unit that was replaced.

5) For a unit that is replaced with purchased power, the allowable NO_x emissions rate used in the above equations set forth in subsection (g)(2) of this Section must be the emissions concentration as set forth in Section 217.388(a) or subsection (g)(6) of this Section, when applicable, for the type of unit that was replaced. For owners or operators replacing units with purchased power, the annual hours of operations that must be used are the calendar year hours of operation for the unit that was shutdown averaged over the three-year period prior to the shutdown. The actual NO_x emissions for the units replaced by purchased power ($EM_{(i)act}$) are zero. These units may be included in any emissions averaging plan for no more than five years beginning with the calendar year that the replaced unit is shut down.

6) For units that have a later compliance date~~non-Appendix G units used in an emissions averaging plan~~, allowable emissions rate used in the above equations set forth in subsection (g)(2) of this Section must be:

A) Prior to the applicable compliance date pursuant to Section 217.392, the higher of the actual NO_x emissions as determined by testing or monitoring data, or the applicable uncontrolled NO_x emissions factor from Compilation of Air Pollutant Emission Factors: AP-42, Volume I: Stationary Point and Areas Sources, as incorporated by reference in Section 217.104); or

B) On and after the unit's applicable compliance date pursuant to section 217.392, the applicable emissions concentration for that type of unit pursuant to Section 217.388(a).

h) For units that use CEMS the data must show that the total mass of actual NO_x emissions determined pursuant to subsection (h)(1) of this Section is less than or equal to the allowable NO_x emissions calculated in accordance with the equations in subsections (f) and (h)(2) of this Section for both the ozone season and calendar year. The equations in subsection (g) of this Section will not apply.

1) The total mass of actual NO_x emissions in lbs for a unit (EM_{act}) must be the sum of the total mass of actual NO_x emissions from each affected unit using CEMS data collected in accordance with 40 CFR 60 or 75, or alternate methodology that has been approved by the Agency or USEPA and included in a federally enforceable permit.

2) The allowable NO_x emissions must be determined as follows:

$$EM_{(all_{(i)})} = \sum_{i=1}^{m} (Cd_i * flow_i * 1.194x10^{-7})$$

Where:

$EM_{all(i)}$ = Total mass of allowable NO_x emissions in lbs for a unit.
$Flow_i$ = Stack flow (dscf/hr) for a given stack.
Cd_i = Allowable concentration of NO_x (ppmv) specified in Section 217.388(a) of this subpart for a given stack. (1.194×10^{-7}) converts to lb/dscf).
j = subscript denoting each hour operation of a given unit.
m = Total number of hours of operation of a unit.
i = Subscript denoting an individual unit and the fuel used.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 217.392 Compliance

a) On and after January 1, 2008, an owner or operator of an affected engine listed in Appendix G may not operate the affected engine unless the requirements of this Subpart Q are met.

b) On and after May 1, 2010, an owner or operator of a unit identified by Section 217.386(b)(2), and that is not listed in Appendix G, may not operate the affected unit unless the requirements of this Subpart Q are met or the affected unit is exempt pursuant to Section 217.386(b).

c) Owners and operators of an affected unit may use NO_x allowances to meet the compliance requirements in Section 217.388 as specified below. A NO_x allowance is defined as an allowance used to meet the requirements of a NO_x

trading program administered by USEPA where one allowance is equal to one ton of NO_x emissions.

1) NO_x allowances may be used only under the following circumstances:

A) An anomalous or unforeseen operating scenario inconsistent with historical operations for a particular ozone season or calendar year that causes an exceedance of an emissions or operation hour limitation;

B) To achieve compliance no more than two events in any rolling five-year period; and

C) For a unit that is not listed in Appendix G.

2) The owner or operator of the affected unit must surrender to the Agency a NO_x allowance for each ton or portion of a ton of NO_x by which actual emissions exceed allowed emissions. Where a low usage limitation under Section 217.388(c)(2) has been exceeded, the owner or operator of the affected unit must calculate the NO_x emissions resulting from the number of hours that exceeded the operating hour low usage limit and surrender to the Agency one NO_x allowance for each ton or portion of a ton of NO_x that was calculated. For noncompliance with a seasonal limit in Section 217.388(b), only a NO_x ozone season allowance must be used. For noncompliance with the emissions concentration limits in Section 217.388(a), low usage limitations in Section 217.388(c) or an annual limitation in an emissions averaging plan in Section 217.388(b), only a NO_x annual allowance may be used.

3) The owner operator must submit a report documenting the circumstances that required the use of NO_x allowances and identify what actions will be taken in subsequent years to address these circumstances and must transfer the NO_x allowances to the Agency's federal NO_x retirement account. The report and the transfer of allowances must be submitted by October 31 for exceedances during the ozone season and March 1 for exceedances of the emissions concentration limits, the annual emissions averaging plan limits, or low usage limitations. The report must contain the NATS serial numbers of the NO_x allowances.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

Section 217.394 Testing and Monitoring

a) An owner or operator must conduct an initial performance test pursuant to subsection (c)(1) or (c)(2) of this Section as follows:

1) By January 1, 2008, for affected engines listed in Appendix G. Performance tests must be conducted on units listed in Appendix G, even if the unit is included in an emissions averaging plan pursuant to Section 217.388(b).

2) By the applicable compliance date as set forth in Section 217.392, or within~~Within~~ the first 876 hours of operation per calendar year, which ever is later:

   A)~~. Performance tests must be conducted on~~ For affected units not listed in Appendix G that operate more than 876 hours per calendar year; and

   B) For units that are not affected units that are included in an emissions averaging plan and operate more than 876 hours per calendar year.

3) Once within the five-year period after the applicable compliance date as set forth in Section 217.392:

   A) For affected units that operate fewer than 876 hours per calendar year; and~~. Performance tests must be conducted on~~

   B) For units that are not affected units that are included in an emissions averaging plan and that operate fewer than 876 hours per calendar year.

b) An owner or operator of an engine or turbine must conduct subsequent performance tests pursuant to subsection (c)(1), ~~or~~ (c)(2), or (c)(3) of this Section as follows:

1) For affected engines listed in Appendix G and all units included in an emissions averaging plan, once every five years. Testing must be performed in the calendar year by May 1 or within 60 days after starting operation, whichever is later;

2) If the monitored data shows that the unit is not in compliance with the applicable emissions concentration or emissions averaging plan, the owner or operator must report the deviation to the Agency in writing within 30 days and conduct a performance test pursuant to subsection (c) of this Section within 90 days of the determination of noncompliance; and

3) When in the opinion of the Agency or USEPA, it is necessary to conduct testing to demonstrate compliance with Section 217.388, the owner or

operator of a unit must, at his or her own expense, conduct the test in accordance with the applicable test methods and procedures specified in this Section within 90 days after receipt of a notice to test from the Agency or USEPA.

c) Testing Procedures:

1) For an engine: The owner or operator must conduct a performance test using Method 7 or 7E of 40 CFR 60, appendix A, as incorporated by reference in Section 217.104. Each compliance test must consist of three separate runs, each lasting a minimum of 60 minutes. NO_x emissions must be measured while the affected unit is operating at peak load. If the unit combusts more than one type of fuel (gaseous or liquid) including backup fuels, a separate performance test is required for each fuel.

2) For a turbine ~~included in an emissions averaging plan~~: The owner or operator must conduct a performance test using the applicable procedures and methods in 40 CFR 60.4400, as incorporated by reference in Section 217.104.

d) Monitoring: Except for those years in which a performance test is conducted pursuant to subsection (a) or (b) of this Section, the owner or operator of an affected unit or a unit included in an emissions averaging plan must monitor NO_x concentrations annually, once between January 1 and May 1 or within the first 876 hours of operation per calendar year, whichever is later. If annual operation is less than 876 hours per calendar year, each affected unit must be monitored at least once every five years. Monitoring must be performed as follows:

1) A portable NO_x monitor utilizing method ASTM D6522-00, as incorporated by reference in Section 217.104, or a method approved by the Agency must be used. If the engine or turbine combusts both liquid and gaseous fuels as primary or backup fuels, separate monitoring is required for each fuel.

2) NO_x and O_2 concentrations measurements must be taken three times for a duration of at least 20 minutes. Monitoring must be done at highest achievable load. The concentrations from the three monitoring runs must be averaged to determine whether the affected unit is in compliance with the applicable emissions concentration or emissions averaging plan as specified in Section 217.388.

e) Instead of complying with the requirements of subsections (a), (b), (c) and (d) of this Section, an owner or operator may install and operate a CEMS on an affected unit that meets the applicable requirements of 40 CFR 60, subpart A, and appendix B, incorporated by reference in Section 217.104, and complies with the

quality assurance procedures specified in 40 CFR 60, appendix F, or 40 CFR 75 as incorporated by reference in Section 217.104, or an alternate procedure as approved by the Agency or USEPA in a federally enforceable permit. The CEMS must be used to demonstrate compliance with the applicable emissions concentration or emissions averaging plan only on an ozone season and annual basis.

f) The testing and monitoring requirements of this Section do not apply to affected units in compliance with the requirements of the low usage limitations pursuant to Section 217.388(c) or low usage units using NO_x allowances to comply with the requirements of this Subpart pursuant to Section 217.392(c). Notwithstanding the above circumstances, when in the opinion of the Agency or USEPA, it is necessary to conduct testing to demonstrate compliance with Section 217.388, the owner or operator of a unit must, at his or her own expense, conduct the test in accordance with the applicable test methods and procedures specified in this Section within 90 days after receipt of a notice to test from the Agency or USEPA.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Section 217.396 Recordkeeping and Reporting

a) Recordkeeping. The owner or operator of a unit included in an emissions averaging plan or an affected unit that is not exempt pursuant to Section 217.386(b) and is not subject to a the low usage exemption of Section 217.388(c) ~~of an Appendix G unit or a unit included in an emissions averaging plan~~ must maintain records that demonstrate compliance with the requirements of this Subpart Q which include, but are not limited to:

1) Identification, type (e.g., lean-burn, gas-fired), and location of each unit.

2) Calendar date of the record.

3) The number of hours the unit operated on a monthly basis, and during each ozone season.

4) Type and quantity of the fuel used on a daily basis.

5) The results of all monitoring performed on the unit and reported deviations.

6) The results of all tests performed on the unit.

7) The plan for performing inspection and maintenance of the units, air pollution control equipment, and the applicable monitoring device

pursuant to Section 217.388(d)~~(c)~~.

8) A log of inspections and maintenance performed on the unit's air emissions, monitoring device, and air pollution control device. These records must include, at a minimum, date, load levels and any manual adjustments along with the reason for the adjustment (e.g., air to fuel ratio, timing or other settings).

9) If complying with the emissions averaging plan provisions of Sections 217.388(b) and 217.390 copies of the calculations used to demonstrate compliance with the ozone season and annual control period limits, noncompliance reports for the ozone season, and ozone and annual control period compliance reports submitted to the Agency.

10) Identification of time periods for which operating conditions and pollutant data were not obtained by either the CEMS or alternate monitoring procedures including the reasons for not obtaining sufficient data and a description of corrective actions taken.

11) Any NO_x allowance reconciliation reports submitted pursuant to Section 217.392(c)(3).

b) The owner or operator of an affected unit or unit included in an emissions averaging plan must maintain the records required by subsections~~subsection~~ (a) or (d) of this Section, as applicable, for a period of five-years at the source at which the unit is located. The records must be made available to the Agency and USEPA upon request.

c) Reporting Requirements

1) The owner or operator must notify the Agency in writing 30 days and five days prior to testing pursuant to Section 217.394(a) and (b) and:

A) If after the 30-days notice for an initially scheduled test is sent, there is a delay (e.g., due to operational problems) in conducting the performance test as scheduled, the owner or operator of the unit must notify the Agency as soon as possible of the delay in the original test date, either by providing at least seven days prior notice of the rescheduled date of the performance test, or by arranging a new test date with the Agency by mutual agreement;

B) Provide a testing protocol to the Agency 60 days prior to testing; and

C) Not later than 30 days after the completion of the test, submit the

results of the test to the Agency.

2) Pursuant to the requirements for monitoring in Section 217.394(d), the owner or operator of the unit must report to the Agency any monitored exceedances of the applicable NO_x concentration from Section 217.388(a) or (b) within 30 days after performing the monitoring.

3) Within 90 days after permanently shutting down an affected unit or a unit included in an emissions averaging plan, the owner or operator of the unit must withdraw or amend the applicable permit to reflect that the unit is no longer in service.

4) If demonstrating compliance through an emissions averaging plan:

A) By October 31 following the applicable ozone season, the owner or operator must notify the Agency if he or she cannot demonstrate compliance for that ozone season; and

B) By January 31~~30~~ following the applicable calendar year, the owner or operator must submit to the Agency a report that demonstrates the following:

i) For all units that are part of the emissions averaging plan, the total mass of allowable NO_x emissions for the ozone season and for the annual control period;

ii) The total mass of actual NO_x emissions for the ozone season and annual control period for each unit included in the averaging plan;

iii) The calculations that demonstrate that the total mass of actual NO_x emissions are less than the total mass of allowable NO_x emissions using equations in Sections 217.390(f) and (g); and

iv) The information required to determine the total mass of actual NO_x emissions and the calculations performed in subsection (c~~d~~)(4)(B)(iii) of this Section.

5) If operating a CEMS, the owner or operator must submit an excess emissions and monitoring systems performance report in accordance with the requirements of 40 CFR 60.7(c) and 60.13, or 40 CFR 75 incorporated by reference in Section 217.104, or an alternate procedure approved by the Agency or USEPA and included in a federally enforceable permit.

6) If using NO_x allowances to comply with the requirements of Section 217.388, reconciliation reports as required by Section 217.392(c)(3).

d) The owner or operator of an affected unit that is complying with the low usage provisions of Section 217.388(c) must:

1) For each unit complying with Section 217.388(c)(1), maintain a record of the NO_x emissions for each calendar year;

2) For each unit complying with Section 217.388(c)(2), maintain a record of bhp or MW hours operated each calendar year; and

3) For each unit utilizing NO_x allowances for compliance pursuant to Section 217.392(c)(3), maintain and submit any NO_x allowance reconciliation reports.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

Part 211:

Section 211.1920 Emergency or Standby Unit

"Emergency or Standby Unit" means, for a stationary gas turbine or a stationary reciprocating internal combustion engine, a unit that:

a) Supplies power for the source at which it is located but operates only when the normal supply of power has been rendered unavailable by circumstances beyond the control of the owner or operator of the source and only as necessary to assure the availability of the engine or turbine. An emergency or standby unit may not be operated to supplement a primary power source when the load capacity or rating of the primary power source has been reached or exceeded.

b) Operates exclusively for firefighting or flood control or both.

c) Operates in response to and during the existence of any officially declared disaster or state of emergency.

d) Operates for the purpose of testing, repair or routine maintenance to verify its readiness for emergency or standby use.

e) Notwithstanding any other subsection in this Section, emergency or standby units may operate an additional 50 hours per year in non-emergency situations.

The term does not include equipment used for purposes other than emergencies, as described above, such as to supply power during high electric demand days.

(Source: Amended at ___ Ill. Reg. _____, effective _____)

35 Ill. Adm. Code 201.146

Use the language as it appeared in the first notice as set forth in the Ill. Reg. dated May 4, 2007.

AMENDED

TECHNICAL SUPPORT DOCUMENT FOR CONTROLLING NO_x EMISSIONS FROM STATIONARY RECIPROCATING INTERNAL COMBUSTION ENGINES AND TURBINES R07-19

AQPSTR 07-05

December 20, 2007

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY PLANNING SECTION
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BUREAU OF AIR
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List of Acronyms

A/F	air-to-fuel
ACT	Alternative Control Techniques document
ALAPCO	Association of Local Air Pollution Control Officials
BART	Best Available Retrofit Technology
bhp	brake horsepower
Board	Illinois Pollution Control Board
BOOS	burner out of service
Btu	British Thermal Unit
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CO	carbon monoxide
CO_2	carbon dioxide
CPI	Consumer Price Index
CT	combustion tuning
EE	energy efficiency
EGU	electric generating unit
FIP	Federal Implementation Plan
HC	hydrocarbons
Illinois EPA	Illinois Environmental Protection Agency
ITR	ignition timing retard
Lb	pound
LADCO	Lake Michigan Air Directors' Consortium
LEC	low emission combustion
mmBtu	million British Thermal Units
MW	megawatt
NAA	nonattainment area
NAAQS	National Ambient Air Quality Standards
NO_x	nitrogen oxide
O_2	oxygen
O_3	ozone
$PM_{2.5}$	fine particulate matter
ppm	parts per million
ppmv	parts per million by volume
PSC	prestratified charge
PTE	potential to emit
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
RIA	Regulatory Impact Analysis
RICE	stationary reciprocating internal combustion engine
SCR	selective catalytic reduction
SI	spark-ignited
SIP	State Implementation Plan
SNCR	selective non-catalytic reduction
SO_2	sulfur dioxide
STAPPA	State and Territorial Air Pollution Program

TSD	Technical Support Document
TPY	tons per year
VOM	volatile organic material
ug/m^3	microgram per cubic meter
U.S. EPA	United States Environmental Protection Agency

Executive Summary

This technical support document (TSD) presents the rationale, documentation, and methodology developed by the Illinois Environmental Protection Agency (Illinois EPA) in support of its proposal to amend regulations controlling nitrogen oxide (NO_x) emissions from stationary reciprocating internal combustion engines (RICE) and and propose regulations controlling NO_x emissions from turbines. Reciprocating internal combustion engines and turbines are a significant source category of NO_x emissions in Illinois and a contributor to fine particulate matter ($PM_{2.5}$) and ozone levels in areas of Illinois that are designated as nonattainment areas (NAAs) for these pollutants. This proposal is intended to address the requirement for NO_x Reasonably Available Control Technology (RACT) for these source categories in Illinois' 8-hour ozone and $PM_{2.5}$ nonattainment areas (NAAs). The Illinois EPA intends to address RACT requirements for other source categories in a separate rulemaking. This proposal will also address, in part, federal requirements to achieve emission reductions needed to ensure Reasonable Further Progress (RFP) toward attainment of the NAAQS.

The Illinois EPA is proposing to control NO_x emissions from sources located in the NAAs that have a potential to emit (PTE) of 100 tons per year (TPY) of NO_x, aggregated from all the affected units at the sources. Regulations to control NO_x emissions from RICE down to 500 brake-horsepower (bhp) and turbines down to 3.5 megawatts (MW) are included in this proposal. The proposed regulation does not apply to emergency standby engines; engines used in research and testing for the purposes of performance verification of engines; engines/turbines used for agricultural purpose; and certain portable engines. The Illinois EPA, in consultation with the affected sources, is proposing a low-usage limit of 8 million bhp-hour/year, aggregated from all affected engines at a source, and 20,000 MW-hour/year, aggregated from all affected turbines at a source.

The NO_x control levels proposed in this submittal are considered reasonable, attainable, and cost-effective. The NO_x emissions levels are prescribed in parts per million by volume (ppmv) corrected to 15 percent oxygen (O_2) on a dry basis. The NO_x limits for engines are 150 ppmv for spark-ignited rich-burn; 210 ppmv for spark-ignited lean-burn; 365 ppmv for Worthington

engines; and 660 ppmv for diesel engines. For turbines, the NO_x limits are 42 ppmv for gas-fired, and 96 ppmv for liquid-fired turbines. An owner or operator may comply with the control requirements by averaging the emissions of affected units. Compliance with the emission limits will be determined on both an ozone season (May 1 to September 30) and an annual (January 1 to December 31) basis each year.

The Illinois EPA relied on the cost data and cost effectiveness estimates contained in the U.S. EPA's alternative control technology (ACT) guidance documents prepared by the U.S EPA for RICE and turbines. The proposed regulation amends 35 Ill. Adm. Code Subpart Q and will potentially affect a total of 63 RICE and 58 turbines in Illinois not previously affected by Subpart Q. When fully implemented, NO_x emissions will be reduced statewide by approximately 2,155 TPY and 1,020 tons per ozone control season.

1.0 Introduction

This TSD presents the rationale, documentation, and methodology developed by the Illinois EPA to support its proposed regulation to control NO_x emissions from RICE and turbines. RICE and turbines are significant sources of NO_x emissions in Illinois. Based on the Illinois EPA's 2002 base year emissions inventory, out of 277,899 TPY of NO_x emissions from point sources in Illinois, approximately 23,347 TPY of NO_xwere emitted from RICE and turbines. This represents approximately 8.4 percent of Illinois' total point source NO_x emissions.

The Illinois EPA has the responsibility under the CAA to develop a State Implementation Plan (SIP) which provides for Reasonably Available Control Technology (RACT) for NO_x in moderate 8-hour ozone and $PM_{2.5}$ NAAs. This proposal is intended to address the requirement for RACT for NO_x for these source categories. The Illinois EPA intends to address RACT requirements for other source categories in a separate rulemaking. This proposal will also address, in part, federal requirements to achieve emission reductions needed to meet the RFP requirements for the 8-hour ozone standard.

A brief summary of the various sections in this TSD is as follows:

Section 2 provides background information on ozone and particulate matter air quality and the effects of these pollutants on human health. The regulatory requirements that are being addressed by this proposal are also described in Section 2.

Section 3 contains descriptions of the various types of internal combustion engines and turbines and how NO_x emissions are generated by these processes. Also presented in this Section are the estimated uncontrolled levels of NO_x emissions from RICE and turbines in Illinois.

Section 4 identifies control techniques available to reduce NO_x emissions from RICE and turbines.

General cost information on various control technologies is discussed in Section 5. This Section provides cost information for the various control technologies that are available to control NO_x emissions from stationary RICE and turbines, described in terms of cost effectiveness of controls (i.e., dollars per ton of NO_x emission reduced) to comply with the proposed regulation.

Existing and proposed regulations are discussed in Section 6. This Section summarizes the existing Illinois NO_x regulations, and other states' NO_x regulations for RICE and turbines, and concludes with an explanation of the proposed regulations.

Sources in Illinois that are potentially affected by the proposed regulations are listed in Section 7. Also described in this Section is the methodology that the Illinois EPA used to identify sources that may potentially be affected by the proposed regulations.

Section 8 provides an estimate of emissions reductions that will be achieved by implementing the Illinois EPA's proposal and explains the methodology used by the Illinois EPA to estimate NO_x emissions reductions from this proposal.

Finally, a summary of this TSD is provided in Section 9.

2.0 Background

2.1 National Ambient Air Quality Standards for Ozone and Fine Particulates

The U.S. EPA revised the NAAQS for particulate matter and ozone in 1997.[1, 2] The revised standards for particulate matter recognized that the smallest particles, those less than equal to 2.5 microns in diameter, have adverse health effects in the humans. In response to the establishment of the NAAQS for $PM_{2.5}$, U.S. EPA designated two areas in Illinois as NAAs: the Chicago area (consisting of Cook, DuPage, Kane, Lake, McHenry, and Will counties, and the townships of Oswego, in Kendall County, and Aux Sable and Goose Lake, in Grundy County), and the Metro-East St. Louis area (consisting of Madison, Monroe, and St. Clair counties, and Baldwin Township in Randolph County). Figure 2-1 shows the $PM_{2.5}$ NAAs for Illinois and nearby states. These designations became effective on April 5, 2005 (70 *FR* 943).[3]

The revised NAAQS for ozone replaced the previous 1-hour averaging time with an 8-hour averaging time, and reduced the applicable ambient concentration threshold from 0.12 parts per million (ppm) to 0.08 ppm. U.S. EPA designated certain areas in Illinois and other states as nonattainment for this air quality standard. Figure 2-2 shows the 8-hour ozone NAAs for the states in the central United States. These designations became effective on June 15, 2004 (69 *FR* 23858).[4] Geographically, the ozone NAAs in Illinois are roughly the same areas that were designated as nonattainment for $PM_{2.5.}$ The exception is in the Metro-East area. The 8-hour ozone NAA includes Jersey County and does not include Baldwin Township in Randolph County, while the $PM_{2.5}$ NAA does not include Jersey County but does include Baldwin Township.

Fine particles and ozone are associated with thousands of premature deaths and illnesses each year in the United States. In revising the NAAQS for particulate matter, U.S. EPA found that fine particles aggravate respiratory, lung, and cardiovascular diseases, decrease lung function, and increase asthma attacks, heart attacks, and cardiac arrhythmia. As a consequence of exposure to $PM_{2.5}$, hospital admissions and emergency room visits increase as does absenteeism from school and work. Older adults, people with heart and lung disease, and children are the segments of society that are particularly sensitive to fine particle exposure. Attainment of the

$PM_{2.5}$ standard will prolong thousands of lives in Illinois and other states. Additional information on the health effects of fine particles can be found on U.S. EPA's website at http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html.

Figure 2-1

$PM_{2.5}$ Nonattainment Areas

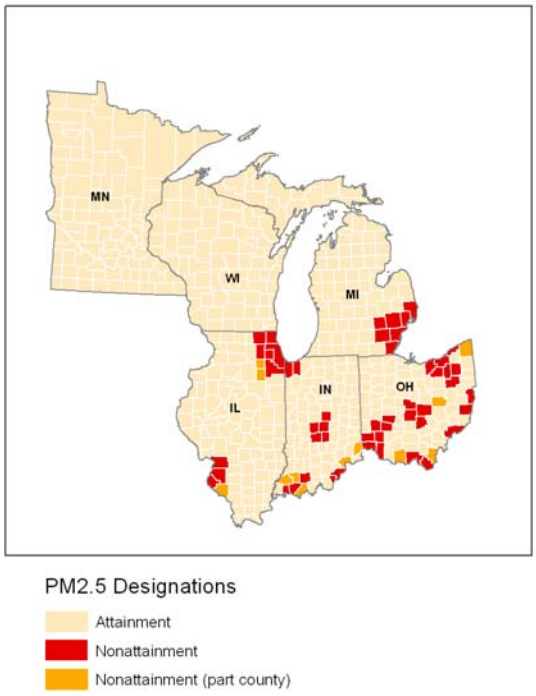
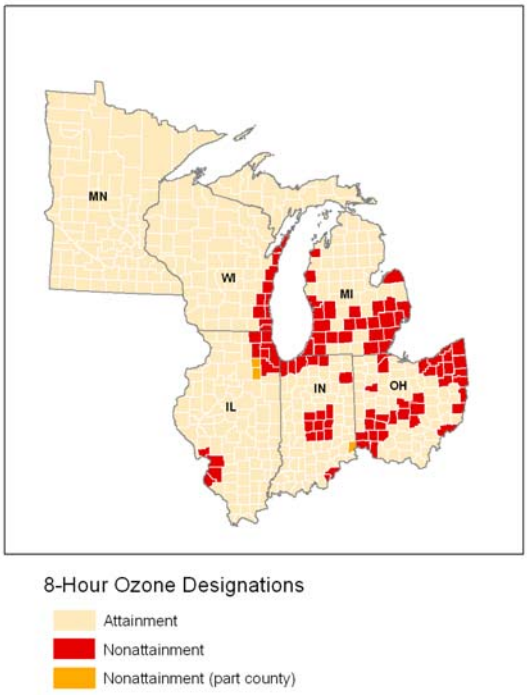


Figure 2-2

8-Hour Ozone Nonattainment Areas



U.S. EPA's revised NAAQS for ozone was intended to provide increased protection to the public, especially children and other at-risk populations, against a wide range of ozone-induced health effects. In setting the 8-hour ozone standard, U.S. EPA found that exposures to ozone of one to three hours in length had been found to irritate the respiratory system, causing coughing, throat irritation, and chest pain. Ozone exposure can limit lung function and breathing capacity, resulting in rapid and shallow breathing, thereby lowering or curtailing a person's normal activity level. As with $PM_{2.5}$ exposure, ozone exposure increases asthma attacks for people with

respiratory disorders. Longer-term ozone exposure may result in damage to the lung tissue and lining from inflammation, which can produce permanent and irreversible changes in lung function. Children and adults who are active outdoors are particularly susceptible to ozone, as are people with asthma and respiratory diseases. Ozone also affects sensitive ecosystems and vegetation, resulting in reduced crop yields, reduced growth and lowered pest resistance, and a lowered ability for plants and trees to survive. Additional information on the health effects to humans and vegetation from exposure to ozone is found on U.S. EPA's website: http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_index.html

U.S. EPA has long recognized the relationship between emissions of NO_x and adverse regional air quality issues and federal efforts to reduce emissions of NO_x were initiated in 1990. The CAA placed several new requirements to reduce NO_x emissions. The federal programs that affect NO_x emissions sources are discussed in the following subsections.

2.2 Reasonably Available Control Technology (RACT)

Pursuant to Sections 172, 182(b) and (f) of the CAA, RACT is required for all existing major sources of the applicable criteria pollutant and its precursors located in NAAs. This rulemaking addresses NO_x as a precursor to ozone and $PM_{2.5}$. U.S. EPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological feasibility and economic reasonableness (70 *Fed. Reg.* 71612).[5] The major source threshold for moderate NAAs is defined as 100 TPY. A source generally consists of several units that emit pollutants. The sum of emissions from all units at the source determines if a unit is major and thus subject to RACT requirements. This rulemaking addresses two RACT categories, engines and turbines. Additional RACT categories will be addressed in subsequent rulemakings.

RACT is not a new requirement under the CAA, but one that had previously been waived with respect to Illinois' two ozone NAAs. For the implementation of the 1-hour ozone NAAQS, Illinois requested and received a waiver under Section 182(f) of the CAA from the requirement to implement NO_x RACT for major sources located in ozone NAAs. With respect to the 8-hour ozone NAAQS, the Illinois EPA will not pursue the NO_x waiver because the local-scale, NO_x

disbenefit (i.e., the scavenging of ambient ozone by local nitrogen oxide emissions) is not as important for the longer 8-hour averaging time. Also, the level of the 8-hour ozone standard is closer to regional background levels in the Midwest, which argues for the application of controls on a regional basis. The Illinois EPA therefore intends to submit a SIP revision to implement NO_x RACT requirements per Sections 182(b)(2) and 182(f) of the CAA. Pursuant to 40 CFR 51.912, the State is required to submit a RACT SIP no later than 27 months (September 2006) after designation of NAAs that provides for implementation of the measures no later than the first ozone season that occurs 30 months after the RACT SIP is due (2009 ozone season). (70 *FR* 71611, 71701)[5]

U.S. EPA finalized its implementation guidance for the $PM_{2.5}$ NAAQS on April 25, 2007.[6] This guidance document addresses RACT requirements for $PM_{2.5}$ and its precursors, including NO_x. Based on U.S. EPA's implementation guidance, Illinois' SIP must include a demonstration that all Reasonably Available Control Measures (RACM), which includes RACT, have been adopted as necessary to demonstrate attainment as expeditiously as practicable and to meet any RFP requirements. In determining RACM, the state must adopt technically and economically feasible measures if collectively the measures would advance the attainment date by one year. Therefore, for $PM_{2.5}$, RACT is part of RACM, unlike ozone, and is not an independent requirement. In the case of electric generating units (EGUs) regulated under the Clean Air Interstate Rule (CAIR), however, U.S. EPA's guidance does require that EGUs with existing controls must operate those controls year-round to satisfy RACT.

Since affected emission units, engines and turbines, under this proposal must comply with seasonal emission limitations to satisfy RACT for ozone, it is appropriate to also require that these limitations continue on an annual basis to improve $PM_{2.5}$ air quality. Continuing controls on an annual basis will not, in most cases, cause significant additional costs to affected sources, and is consistent with the regulations previously adopted for engines under Subpart Q.

2.3 Reasonable Further Progress (RFP)

For an area classified as an ozone NAA under Subpart 2 of Part D of the CAA, and the requirements of Section 182, a state is required to submit a SIP revision that includes measures

that ensure RFP towards the emissions reductions targets needed for attainment (40 CFR 51.910). To meet RFP requirements of Section 172(c)(2) of CAA, the state is required to submit no later than 3 years (June 2007) following designation for the 8-hour NAAQS, a SIP providing for RFP from the baseline year (2002) within 6 years after the baseline year (2008). The state may use either NO_x for VOM emission reductions (or both) to achieve the RFP reduction requirement. Use of NO_x emissions reductions must meet the criteria in Section 182(c)(2)(C) of the CAA. For each subsequent 3-year period out to the attainment date, the RFP SIP must provide for an additional increment of progress.

3.0 Process Description and Sources of Emissions

3.1 Stationary Reciprocating Internal Combustion Engines (RICE)

"Controlling Nitrogen Oxides Under the Clean Air Act: A Menu of Options,"[7] a document published in July 1994 by the State and Territorial Air Pollution Program Administrators (STAPPA)/Association of Local Air Pollution Control Official (ALAPCO), summarizes how RICE operate and how they generate NO_x emissions. RICE are the stationary relatives of motor vehicle engines, using the combustion of fuel in cylinders to drive pistons with crankshafts, which convert the linear piston motion to rotary motion. Ignition of the fuel in reciprocating engines may be initiated by a spark or by the heat generated in the compression stroke of a piston. Spark ignited ("SI") engines typically burn gasoline or, in large engines, natural gas, while compression ignition engines burn diesel oil or a dual-fuel (diesel oil-natural gas) mixture.

Reciprocating engines have either four-stroke or two-stroke operating cycles. A typical automotive engine uses a four-stroke cycle of intake, compression, power, and exhaust. Two-stroke engines complete the power cycle in a single engine revolution compared to two revolutions for four-stroke engines.

A final classification of reciprocating engines that influence the choice of NOx control alternatives is based on the engine air-to-fuel ratio and the exhaust oxygen content. Rich-burn engines, which include four-stroke spark ignition engines, typically operate with an air-to-fuel ratio near stoichiometric and exhaust oxygen concentrations of one percent or less. Lean-burn engines, which include two-stroke spark ignition and all compression ignition engines, have a lean air-to-fuel ratio and typical exhaust oxygen concentrations of greater than one percent.

Reciprocating engines are used throughout the United States to drive compressors, pumps, electric generators and other equipment. One prominent use of large engines is to drive natural gas pipeline compressor stations. Except for three engines compressing ammonia at a chemical plant, all engines affected by the NO_x SIP Call-Phase 2 rule in Illinois are used to compress natural gas at natural gas pipeline stations. All currently operating RICE that are large enough to

be affected by the Illinois EPA proposal are either rich-burn or lean-burn engines that burn natural gas exclusively.

RICE are significant sources of NO_x because they burn large amounts of fuel at high temperatures and pressures, which cause the nitrogen and oxygen in the air that sustains the combustion to unite and form the various oxides of nitrogen that constitute NO_x. Thermal NO_x is the predominant mechanism by which NO_x is formed in RICE. Reducing combustion temperatures and pressures are therefore effective in reducing NOx emissions from reciprocating engines. Although in theory additional NO_x could be formed from nitrogen found in the fuel, virtually all RICE burn fuels containing little if any nitrogen. Therefore, fuel NO_x formation is minimal in RICE.

3.2 Stationary Turbines

The same STAPPA/ALAPCO document,[7] referenced to previously in Section 3.1 also provides a description and sources of NO_x emissions from turbines. A gas turbine is an internal combustion engine that operates with rotary rather than reciprocating motion. There are three basic phases in the operation of a turbine: compression, combustion, and conversion to power. Ambient air is drawn in and compressed up to 30 times ambient pressure and directed to the combustor section where fuel is introduced, ignited, and burned. Hot combustion gases are then diluted with additional air from the compressor and directed to the turbine section at temperatures up to 2,350°F. Energy from the hot expanding exhaust gases are then recovered in the form of a shaft horsepower, of which 50 percent is needed to drive the internal compressor, and the balance of recovered shaft energy is available to drive external load units.

The heat content of gases exiting the turbine can either be discarded without heat recovery (simple cycle); used with a heat exchanger to preheat combustion air entering the combustor (regenerative cycle); used with or without supplementary firing, in a heat recovery steam generator to raise process steam temperature (cogeneration); or used with or without supplementary firing to raise steam temperature for a steam turbine Rankine cycle (combined cycle or repowering). The majority of turbines used in large stationary installations are either

peaking simple cycle, two-shaft or base load, combined cycle turbines. Smaller turbines are used to compress gas in natural gas pipelines or to generate electricity.

The principle type of NO_x formed in a turbine firing natural gas or distillate oil is thermal NOx. Most thermal NO_x is formed in high temperature stoichiometric flame pockets downstream of fuel injectors where combustion air has mixed sufficiently with the fuel to produce the peak temperature fuel/air interface. The maximum thermal NO_x production occurs at a slightly lean-fuel mixture because of excess oxygen available for reaction. The control of stoichiometry is critical in achieving reduction in thermal NO_x. The thermal NO_x generation also decreases rapidly as the temperature drops below the adiabatic temperature (for a given stoichiometry). Maximum reduction in thermal NO_x generation can thus be achieved by control of both the combustion temperature and the stoichiometry.

Table 3-1 describes the uncontrolled NO_x emissions in parts per million by volume (ppmv) corrected to 15 percent oxygen (O_2) from various types of RICE and turbines.

Table 3-1

Uncontrolled NO_x Emissions from RICE and Turbines[7,8]

Type of Unit	Uncontrolled NO_x Emissions (ppm@ 15% O_2)	
	Range	Average
Rich-Burn SI Engines	880 – 1090	1060
Lean-Burn SI Engines	580 – 1360	1230
Diesel Engines	820 – 950	880
Dual-Fuel Engines	360 – 780	620
Natural Gas-fired Combustion Turbine	99 – 430	264
Distillate Oil fired Combustion Turbine	150 – 680	415

4.0 Technical Feasibility of Controls

For reciprocating engines and turbines both combustion controls and post-combustion catalytic reduction technologies can be applied to reduce NO_x emissions. Combustion controls for reciprocating engines, include air/fuel ratio adjustments, low emission combustion, and prestratified charge. These controls function by modifying the combustion zone air/fuel ratio, thus influencing oxygen availability and peak flame temperature. Ignition timing retard lowers the peak flame temperature by delaying the onset of combustion. For turbines water/steam injection and dry low-NO_x combustors are the combustion control technologies used to reduce NO_x emissions. The two post-combustion control strategies that destroy NO_x for RICE and turbines are selective catalytic reduction and non-selective catalytic reduction. U.S. EPA's Alternative Control Techniques Document--NO_x Emissions from Stationary Reciprocating Internal Combustion Engines[8], and NO_x Emissions from Stationary Gas Turbines,[9] provide additional details on these NO_x control techniques.

4.1 Air/Fuel Ratio Adjustment

Lowering the air-to-fuel (A/F) ratio in rich-burn engines limits oxygen availability in the cylinder, thus decreasing NO_x emissions both by lowering peak flame temperature and by producing a reducing atmosphere. It is generally applicable to rich-burn engines and, in addition to simple adjustment of the A/F ratio, requires the installation of a feedback controller so that changes in load and other operating conditions may be followed. Additional modification of turbocharged engines may be necessary.

Air/fuel ratio adjustment is a well-demonstrated alternative in rich-burn engines and typically yields 10-40 percent reductions in NO_x emissions. This range is broad in part because a wide range of existing air/fuel ratios translates into variable scope for emissions reductions using this technique.

In lean-burn engines, increasing the A/F ratio decreases NO_x emissions. Extra air dilutes the combustion gases, thus lowering peak flame temperature and reducing thermal NO_x formation. In order to avoid an engine's capacity being derated, air flow to the engine must be increased at

constant fuel flow, with the result that installation of a turbocharger (or modification of an existing one) is necessary to implement this technique. An automatic A/F controller also will be required for variable load operation.

Air/fuel ratio adjustment is generally applicable to lean-burn engines, although space constraints may limit the extent to which turbocharger capacity may be increased. This control method is most effective on fuel injected engines, in that carbureted engines do not have the same A/F in each cylinder, thereby limiting changes in this ratio.

Reductions in lean-burn engine NO_x emissions of 5-30 percent are possible by modifying the A/F ratio. Achievable emissions reductions are limited by combustion instability and lean misfire that occur as the lean flammability limit is approached, and by decreased engine efficiency.

Air/fuel ratio adjustment is not applicable to compression ignition engines.

4.2 Ignition Timing Retard

Ignition timing retard (ITR) lowers NO_x emissions by moving the ignition event to later in the power stroke when the piston has begun to move downward. Because the combustion chamber volume is not at its minimum, the peak flame temperature will be reduced, thus reducing thermal NO_x formation.

ITR is applicable to all engines. It is implemented in spark ignition engines by changing the timing of the spark, and in compression ignition engines by changing the timing of the fuel injection. While timing adjustments are straightforward, replacement of the ignition system with an electronic ignition control or injecting timing system will provide better performance with varying engine load and conditions.

Emissions reductions attainable using ITR are variable, depending upon the engine design and operating conditions, and particularly on the air/fuel ratio. Reductions also are restricted by limitations on the extent to which ignition may be delayed, in that excess retard results in engine

misfire. Retard also normally results in decreased fuel efficiency. For spark ignition engines, achievable emissions reductions vary from 0-40 percent, and for compression ignition engines, from 20-30 percent.

ITR results in increased exhaust temperatures, which may result in reduced exhaust valve and turbocharger life. On diesel engines, it also may result in black smoke.

4.3 Prestratified Charge

Prestratified charge (PSC) is a technology for injecting fuel and air into the intake manifold in distinct "slugs," which become separate fuel and air layers upon intake into the cylinders. This control alternative thus creates a fuel-rich, easily ignitable mixture around the spark plug and an overall fuel-lean mixture in the piston. Combustion occurs at a lower temperature, thereby producing much less thermal NO_x, but without misfire even as the low flammability limit is approached.

PSC is applicable to carbureted, spark ignition four-stroke engines. Engines, which are fuel-injected or blower-scavenged, cannot use this technique. Kits for retrofitting prestratified charge are available for most engines and require installation of new intake manifolds, air hoses and filters, control valves, and a control system. Controlled emissions normally are less than 2 g/bhp-hr (140 ppm) on natural-gas-fueled engines, corresponding to emissions reductions of 80-95 percent.

4.4 Low Emission Combustion

Low emission combustion (LEC) is the combustion of a very fuel-lean mixture. Under these conditions, NO_x emissions, as well as carbon monoxide (CO) and hydrocarbons (HC), are severely reduced.

Implementation of LEC requires considerable engine modification. Rich-burn engines must be entirely rebuilt, with addition or replacement of the turbocharger and installation of new air intake and filtration, carburetor and exhaust systems. The difficulty of burning very lean mixtures results in the need to modify the combustion chamber, which implies replacing pistons,

cylinder heads, the ignition system and the intake manifold. While small cylinder designs that promote air-fuel mixing are available, precombustion chambers must be installed on larger engines. The chambers have 5-10 percent of the cylinder volume and allow ignition of a fuel-rich mixture that ignites the lean mixture in the cylinder.

The applicability of LEC is somewhat limited. Conversion kits are not available for all engines and refitted engines may have degraded load-following capabilities. Achievable controlled emissions are 1-2 g/bhp-hr (70-140 ppm) for rich-burn engines, which corresponds to an emissions reduction of 70-90 percent, and 1.5-3 g/bhp-hr (105-210 ppm) for lean-burn spark ignition engines, or an emissions reduction of about 80-93 percent.

LEC is not effective for diesel engines, but does work for dual-fuel engines, allowing a reduction in the fraction of diesel oil pilot fuel to 1 percent of the total, and limiting emissions to 1-2 g/bhp-hr (70-140 ppm), a decrease in emissions of 60-80 percent. Some reductions in exhaust opacity have been claimed when LEC is implemented on dual-fuel engines.

4.5 Water/Steam Injection

Water/steam injection lowers peak flame temperatures by providing an inert diluent, thus limiting thermal NO_x formation. Water may be injected directly into the turbine combustor, or may be converted to steam using turbine exhaust waste heat (with a heat recovery steam generator), and then injected into the combustor.

More steam than water must be used to achieve a comparable NO_x reduction. However, the use of steam results in a lower energy penalty than the use of water and may even provide NO_x reductions with no energy penalty if the waste heat used to generate steam would otherwise not be recovered.

Wet injection is applicable to most, if not all, turbines, and has been applied to a large number of turbines in the United States. Required equipment, in addition to water/steam injection nozzles, includes a water treatment system, pumps or a steam generator, metering valves, and controls and piping. Untreated water will lead to deposits on turbine blades, lowering efficiency and

perhaps damaging the turbine. Most turbine manufacturers sell water and steam injection systems.

Controlled NO_x emissions are a function of the amount of water injected and of the fuel/nitrogen content as wet injection limits only thermal NO_x formation. For natural gas, controlled emissions levels of 25-75 ppm are attained with water-to-fuel ratios of about 0.5 – 1.5 lb steam /lb fuel. (Approximately 1-2 lb steam/lb fuel is needed for equivalent control, given the lower heat capacity of steam relative to that of water.) For distillate oil, controlled emissions of 42-110 ppm are attained with similar water-to-fuel ratios. These controlled emissions levels correspond to 60-90 percent emissions reductions.

The need to increase water-to-fuel ratios for increased emission reductions limits NO_x control capabilities. High water-to-fuel ratios result in increased hydrocarbon and greatly increased CO emissions. Further, because heating injected water consumes energy, turbine fuel efficiency may decrease. Wet injection may increase required turbine maintenance as a result of pressure oscillations or erosion caused by contaminates in the feed water.

Finally, the water treatment plant creates wastewater. This wastewater is enriched approximately three-fold by the dissolved minerals and pollutants that were in the raw water.

4.6 Dry Low-NOx Combustors

Dry low-NO_x combustors encompass several different technologies. Lean premixed combustion is the commercially available technology that affords the largest NO_x reductions. It functions by providing a large amount of excess air to the combustion chamber, lowering peak temperatures by dilution. Air and fuel are premixed in lean premixed combustors to avoid the creation of local fuel-rich, and therefore high-temperature, regions.

While retrofit low-NO_x combustors are not available for all turbine models, they have been installed on many turbines in the United States. Lean premixed combustor retrofits face varying difficulties. Because lean premixed combustors reduce thermal NO_x generation only, they are less effective on oil-fired than on gas-fired turbines. Except in the case of silo combustors,

which are external to the turbine body, the retrofits may require some modification of the combustor section of the turbine. Water/steam injection provides comparable reductions on oil-fired turbines without retrofit of low-NO_x combustors.

Controlled emissions levels achievable on gas-fired turbines are on the order of 25-42 ppm. On some larger turbines, manufacturers are guaranteeing emissions of 9 ppm, and more will approach this limit with improvements in technology. These figures correspond to NO_x emissions reductions of 60-95 percent. Maximum reductions are attained only at high turbine loads. Given reduced fuel requirements at low loads, premixing would yield air/fuel mixtures near the lean flammability limit, with resulting flame instability and high CO emissions. Thus, lean premixed combustors use diffusion flames at low loads.

4.7 Non-Selective Catalytic Reduction (NSCR)

Non-selective catalytic reduction (NSCR) uses the three-way catalysts found in automotive applications to promote the reduction of NO_x to nitrogen and water. Exhaust CO and HC are simultaneously oxidized to carbon dioxide and water in this process.

NSCR is applicable only to rich-burn engines with exhaust oxygen concentrations below about 1 percent. Lean-burn engine exhaust will contain insufficient CO and HC for the reduction of the NO_x present. NSCR retrofits, in addition to the catalyst and catalyst housing, require installation of an oxygen sensor and feedback controller to maintain an appropriate A/F ratio under variable load conditions. Controlled emissions achievable with NSCR are below 1 g/bhp-hr (70 ppm), corresponding to emissions reductions greater than 90 percent. NSCR controls are not feasible for turbines.[7]

4.8 Selective Catalytic Reduction

The catalyzed reduction of NO_x with injected ammonia, referred to as selective catalytic reduction (SCR), has been implemented on a number of gas, diesel, and dual-fuel engines in the United States. and abroad. SCR is applicable only to lean-burn engines with greater than about one percent exhaust oxygen, as oxygen is a reagent in the selective reduction reaction.

Retrofitting SCR involves installation of the reactor and catalyst, appropriate ductwork, an ammonia storage and distribution system, and a control system for variable load operation. Achievable emissions reductions are limited only by the amount of catalyst used, and typically are on the order of 90 percent, yielding controlled emissions below two g/bhp-hr (140 ppm). Achievable NO_x emissions reductions using SCR exceed 90 percent, which corresponds to controlled emissions below 10 ppm and 25 ppm for many gas-fired and oil-fired turbines.

4.9 Technical Feasibility of Controls Summary

In summary, there are a number of techniques and control options available for reducing emissions of NO_x from RICE and turbines. The degree to which these various methods reduce NO_x emissions depends upon the type of engine and the fuel used in the engine. In their publication "Controlling Nitrogen Oxides Under the Clean Air Act,"[7] STAPPA/ALAPCO summarizes the potential emissions reductions from RICE and turbines. Tables 4-1 and 4-2 describe the NO_x emissions reductions potential of the various control strategies for reciprocating engines and turbines.

Table 4-1
Potential Emissions Reductions from Reciprocating I. C. Engines[7]

Control	NO_x Reduction Potential (%)			
	Rich-Burn Gas SI	**Lean-Burn Gas SI**	**Diesel**	**Dual Fuel**
Air/Fuel Ratio Adjustment	10 – 40	5 - 30	N/A	N/A
Ignition Timing Retard	0 – 40	0 - 20	20 - 30	20 – 30
Prestratified Charge	80 – 90	N/A	N/A	N/A
Low Emission Combustion	70 – 90	80 - 93	N/A	60 – 80
Non-selective Catalytic Reduction	90 – 98	N/A	N/A	N/A
Selective Catalytic Reduction	N/A	90	80 - 90	80 – 90

Table 4-2
Potential Emissions Reductions from Turbines[7]

Control	Emissions Reduction Potential (%)
Water/Steam Injection	70 - 90
Low-NOx Combustors	60 – 90
Selective Catalytic Reduction	90

5.0 Cost Effectiveness of Controls

The U.S. EPA has prepared a number of estimates of the cost effectiveness of controlling NO_x emissions from RICE. The most recent and significant estimates are contained in federal ACT documents for RICE and turbines.[8,9] The Illinois EPA relied on these documents to estimate the cost effectiveness of controlling Illinois NO_x sources potentially affected by this proposed rulemaking.

5.1 Cost Effectiveness of Controls on RICE

The Illinois EPA relied on U.S. EPA's cost estimates from the ACT document for RICE.[8] To estimate cost effectiveness of controls, U.S. EPA considers total capital costs and total annual costs. The total capital cost is the sum of the purchased equipment costs, direct installation costs, indirect installation costs, and contingency costs. Annual costs consist of the direct operating costs of materials and labor for maintenance, operation, utilities, material replacement and disposal, and indirect operating charges including plant overhead, general administration, and capital recovery charges. Cost effectiveness, in dollars/ton of NO_x removed, is calculated for each control technique by dividing the total annual cost by the annual tons of NO_x removed.

U.S. EPA's ACT document describes the costs of various NO_x controls applicable to RICE. Depending on the type, size, and operating hours of the engine, the cost effectiveness of each control varies from a few hundred to several thousands dollars per ton of NO_x removed. The cost information in the ACT document is reported in 1993 dollars. The Illinois EPA used Consumer Price Index (CPI) conversion factor of 0.765 for 1993 to arrive at 2004 dollars. Table 5-1 summarizes the cost effectiveness of various control options for engines equal to or greater than 500 bhp.

Based on the ACT, there are a number of control options available which achieve the control levels proposed in this rulemaking. The cost effectiveness ranges from $163 to $5,961 per ton of NO_x removed on an annual basis.

Table 5-1

Cost Effectiveness for Retrofit of Various NO_x Controls Systems[8]

Type of Control	Engine Size (bhp)	Total Capital Cost (Thousands of 2004 dollars)	Cost Effectiveness (2004 dollars/ ton of NO_x removed)
Automatic A/F Control to Rich-Burn SI Engine	500 – 8000	14.9-32.0	567-1,080
Electronic Ignition to Rich-Burn SI Engine	500 – 8000	15.9-32.0	469-987
A/F + Electronic Ignition to Rich-Burn SI Engine	500 – 8000	30.8-63.9	540-1,065
Prestratified Charge to Rich-Burn SI Engine	500 – 8000	66.0-113.5	163-1,712
Prestratified Charge with Turbocharger to Rich-Burn SI Engine	500 – 8000	146.4-279.7	204-2,026
NSCR to Rich-Burn Engine SI Engine	500 – 8000	35.4-330.7	319-1,647
Low Emission Combustion to Medium Speed Rich-Burn or Lean-Burn SI Engine	500 – 8000	15.6-1,947.7	464-629
Low Emission Combustion to Low Speed Rich-Burn or Lean-Burn SI Engine	500 – 8000	639.2-4,052.3	991-2,575
Automatic A/F control to Lean-Burn SI Engine	550 - 11000	98.8-169.9	427-2,000
Electronic Ignition to Lean-Burn SI Engine	550 - 11000	15.9-32.0	652-1,556
A/F + Electronic Ignition to Lean-Burn SI Engine	550 - 11000	112.4-197.4	477-1,961
SCR to Lean-Burn SI engine	550 - 11000	457.5-1,451.0	641-3,542
Electronic Injection to Diesel Engine	500 – 8000	15.9-101.8	482-1,012
SCR to Diesel Engine	500 – 8000	308.5-1,264.1	899-4,536
Electronic Injection to Dual-Fuel Engine	700 – 8000	15.9-32.0	627-1,288
SCR to Dual-Fuel Engine	700 – 8000	333.3-1,264.1	1,165-4,745
Low-Emission Combustion to Dual-Fuel Engine	700 – 8000	941.2-5,228.8	2,928-5,961

Another reference document that the Illinois EPA relied upon in the development of this regulatory proposal is "Stationary Reciprocating Internal Combustion Engines .[10] It discusses the uncontrolled and controlled levels of NO_x emissions from RICE and the cost effectiveness of LEC. U.S. EPA obtained information on LEC costs from several sources. The total capital cost, annual operating cost, and cost effectiveness projections in Table 5-2 are based on actual costs for several LEC retrofits obtained from one engine manufacturer and one third party LEC vendor. Other inputs include uncontrolled NO_x emissions of 16.8 g/bhp-hr, controlled emissions of 2.0 g/bhp-hr, and capacity utilization of 7,000 operating hours per year (prorated for the five months of the ozone season). In most respects, the analysis was conducted according to the

methodology of the 1993 ACT document. The cost data was reported in 1990 dollars and the Illinois EPA adjusted the cost data to 2004 dollars based on the CPI.

Table 5-2

Costs and Cost Effectiveness of LEC Controls in 2004 Dollars[10]

Engine Size, (bhp)	Total Capital	Annual Cost	NO_x Reduction (tons)		Cost Effectiveness ($/ton NO_x)	
			Annual	O_3 Season	Annual	O_3 Season
80	$231,000	$59,100	9	4	7,730	18,510
240	242,000	61,400	27	11	2,680	6,430
500	259,000	65,200	57	24	1,360	3,270
1,000	293,000	72,400	114	48	750	1,820
2,000	359,000	86,900	228	95	450	1,090
4,000	493,000	116,000	457	190	300	730
6,000	627,000	146,000	685	285	250	610
8,000	760,000	175,000	914	381	230	550

5.2 Cost Effectiveness of Controls on Turbines

The Illinois EPA relied on cost data contained in U.S. EPA's ACT [9] for determining cost effectiveness estimates for control of turbines. A compilation of control costs complied by STAPPA/ALAPCO[7] is also summarized here. U.S. EPA's ACT document describes in detail the capital cost and cost effectiveness of various controls for turbines based on 1990 dollars. The 1990 dollar estimates have been adjusted to 2004 dollars throughout this discussion as described in Section 5.1. The cost effectiveness of two types of controls for smaller turbines of 3.3 MW varies from $2,645 per ton of NO_x on an annual basis removed for steam injection to $3,005 per ton of NO_x removed for water injection control. For dry low-NO_x combustion, cost effectiveness was $1,532 per ton of NO_x removed for a four MW gas-fired turbine.

STAPPA/ALAPCO prepared a document which summarizes the cost of controlling various sizes of turbines based on the cost information contained in the ACT for the turbines. The cost information in the STAPPA/ALAPCO document[7] is reported in 1993 dollars. Table 5-3 shows the cost effectiveness of controlling 5 to 25 MW turbines operating 8,000 hours annually.

Table 5-3
Cost Effectiveness for Various NO_x Controls Systems for Turbines[7]

Type of Control	Turbine Size (MW)	Total Capital Cost (thousands of 2004 dollars)	Cost Effectiveness (2004 dollars/ ton of NO_x removed)
Water Injection for Gas-Fired	5 – 25	711-1,490	902-2,327
Water Injection for Oil-Fired	5 – 25	745-1,582	732-1,699
Steam Injection for Gas-Fired	5 – 25	928-2,105	993-2,614
Steam Injection for Oil-Fired	5 – 25	974-2,261	680-1,699
Low-NOx Combustor for Gas-Fired	5 – 25	630-1,438	314-1,046
SCR for Gas-Fired	5 – 25	748-2,013	1,606-3,203
SCR for Oil-Fired	5 – 25	748-2,018	1,072-2,039

The Illinois EPA believes that the impacted sources will meet the proposed limits by installing combustion controls. Rich burn engines will install NSCR and lean burn engines will install LEC technologies to comply the regulations. The Illinois EPA believes that retrofit costs of controlling sources at proposed levels will be $319 to $2,575 per ton of NO_x reduced for RICE and $314 to $3,005 per ton of NO_x reduced for turbines in 2004 dollars.

It should be recognized that reducing NO_x emissions by combustion controls on RICE and turbines may increase carbon monoxide emissions in some cases. The Illinois EPA believes that the increases in CO emissions are not significant from an air quality perspective, but may be high enough to trigger Prevention of Significant Deterioration (PSD) permitting requirements in some cases.

6.0 Existing and Proposed Regulations

6.1 Existing Illinois Regulations

In Part 217 of 35 Ill. Adm. Code, Illinois provides NO_x limitations for certain fuel combustion emission units, such as boilers and certain process emission units which use or produce nitric acid. On July 20, 2007, the Board adopted 35 Ill. Adm. Code 217, Subpart Q, "Stationary Reciprocating Internal Combustion Engines and Turbines," in which it regulated the NOx emissions from 28 large RICE engines identified by U.S. EPA under the NOx SIP Call Phase II (R07-18). New Subpart Q contained provisions for NOx concentration levels, emissions averaging plans, monitoring, testing, compliance, dates, recordkeeping, and reporting. Larger non-EGU turbines greater than or equal to 250 mmBtu/hr capacities are regulated under 35 Il. Adm. Code 217, Subpart U, which is the NO_x SIP Call trading program for such units. The owner or operator of any new RICE and turbines is subject to new source review requirements and must meet any applicable New Source Performance Standards (NSPS) set by U.S. EPA. Currently, there are no regulations to control NO_x emissions from smaller turbines less than 250 mmBtu/hr capacities, nor are there regulations to control NOx emissions from reciprocating engines not subject to the new Subpart Q.

6.2 Other States' Regulations

Tables 6-1 and 6-2 contain summaries of the NO_x control requirements in other states. Several states have promulgated rules limiting NO_x emissions from RICE. According to the STAPPA/ALAPCO document[7], Connecticut, Louisiana, New Jersey, New York, Rhode Island, and Texas have established NOx limits based on the RACT requirements for NAAs. Typical NO_x RACT limits are 1.5 – 3.0 g/bhp-hr (105-210 ppm) for gas-fired rich- and lean-burn engines, and 8-9 g/bhp-hr (584-660) for oil-fired lean-burn engines. In California, NO_x emissions limits for RICE are based on the BART NO_x limits. NO_x limits in California's Ventura Bay Area County Air Quality Management Districts (AQMD), Santa Barbara County AQMD, and South Coast AQMD are more stringent than RACT, and are set at 0.6 - 1.9 g/bhp-hr (42 - 133 ppm) for lean-burn engines, 0.4 – 0.8 g/bhp-hr (28 - 70 ppm) for rich-burn engines, and 1.1 - 8.4 g/bhp-hr (80-613 ppm) for diesel engines. The size cut-off for engines to apply controls varies from 50 bhp to 500 bhp in the states mentioned above.

Table 6-1

NOx Control Requirements for RICE in Other States

State	Engine Size Controlled (HP)	Control Level (g/hp-hr)		
		Gas-fired Rich Burn	Gas-fired Lean Burn	Compression Ignited Liquid Fired
Texas[11]	500 and greater	2 g/hp-hr (146 PPM) under all operating conditions	2 g/hp-hr (146 PPM)* at full load, 5 g/hp-hr (365 PPM) at 80-100% load for new SI or CI dual fuel engines manufactured after June 18, 1992; 5 g/hp-hr for older units at all loads, 8 g/hp-hr (584 PPM) at 80-100% load	11 g/hp-hr (803 ppm)
Indiana[12]	NO_x SIP Call	NO_x SIP Call	NO_x SIP Call	NO_x SIP Call
Connecticut[13]	≥ 3 MMBtu/hr (1175 HP)	2.5 g/hp-hr (183 PPM)	_	8 g/hp-hr (584 ppm)
Alabama[14]	NO_x SIP Call	NO_x SIP Call	NO_x SIP Call	NO_x SIP Call
New York[15]	200 HP in Severe Ozone Area and 400 HP in rest of State	2 g/hp-hr (146 PPM) through March 31, 2005 & 1.5 g/hp-hr (110 PPM) after April 1, 2005	3 g/hp-hr (220 PPM) through March 31, 2005 & 1.5 g/hp-hr (110 PPM) after April 1, 2005	9 g/hp-hr (657 ppm) through March 31, 2005 & 2.3 g/hp-hr (168 ppm) after April 1, 2005
New Jersey[16]	≥ 500 HP	1.5 g/hp-hr (110 PPM)	2.5 g/hp-hr (182 ppm)	8 g/hp-hr (584 ppm)
Pennsylvania[17]	153 ton NOx/Season	1.5 g/hp-hr (110 PPM) for ≥2,400 HP	3 g/hp-hr (220 PPM) for ≥ 2,400 HP	2.3 g/hp-hr (168 ppm) for ≥4,400 HP
Maryland[18]	N.G. Pipeline engines > 15% capacity factor	Limits of 300 lb/hr for a facility with 5 or less engines, and 566 lb/hr for a facility with more than 5 engines		
Antelope Valley Air Quality Management District(AVAQMD)[19]	50 HP stationary and 100 HP for portable	Electric motor, 36 ppm for stationary and 80 ppm for portable		Up to 770 ppm for ≥100 HP but less than 400 HP; 535 ppm for ≥ 400HP
San Joanquin Valley Unified Air Pollution Control District (SJVUAPCD)[20]	50 HP	50 ppm or 90% red. For waste gas/field gas engine and 25 ppm or 96% red. for others	75 ppm or 85% red for two stroke gaseous fuel < 100HP engine and 65 ppm for other	65ppm or 90% reduction
El Dorado County Air Pollution Control District (EDCAPCD)[21]	50 HP	25 ppm to 50 ppm based on compliance dates	65 ppm to 125 ppm based on compliance date	600 ppm to 700 ppm based on compliance date
IEPA Proposed	500 HP	150 ppm	210 ppm except 365 for Worthington engines	660 ppm

Note: 1) NO_x SIP Call requires 82 to 90 percent control on large engines that emitted one ton of NOx in any 1995 ozone season day.[22]

2) 1 g/hp-hr = 73 ppm conversion factor was used to convert g/hp-hr to ppmv at 15 percent O_2 on a dry basis.

Table 6-2

NO_x Control Requirements for Turbines in Other States

State	Turbine Size Controlled (HP)	Control Level
Texas[11]	≥ 500 HP (0.37 MW)	3 g/hp-hr (0.82 lb/mmBtu) (220 ppm)
Indiana[12]	250 mmBtu/hr (≈ 25 MW)	Budget allowances under NOx Emissions Trading Program
Connecticut[13]	Up to 100 mmBtu/hr (≈ 10 MW)	55 ppm for Gas-fired, 75 ppm for Oil-fired
	< 100 mmBtu/hr	0.9 lb/mmBtu (224 to 245 ppm)
New York[15]	≥ 10 mmBtu/hr (≈ 1 MW)	RACT, For Simple Cycle 50 ppm for gas, 100 ppm for oil; for combined cycle 42 ppm for gas and 65 ppm for oil
New Jersey[16]	≥ 30 mmBtu/hr (≈ 3 MW)	For simple cycle gas-fired 0.2 lb/mmBtu (50 PPM), for oil-fired 0.4 lb/mmBtu (109 ppm); for combined cycle gas-fired 0.15 lb/mmBtu (37 ppm), and for oil-fired 0.35 lb/mmBtu (95 ppm)
Maryland[18]	≥ Capacity factor 15%	42 ppm for gas burning and 65 ppm for oil burning
South Coast Air Quality Management District (SCAQMD)[23]	≥ 0.3 MW	9 ppm to 25 ppm depending on the size and type
IEPA Proposed	≥ 3.5 MW	42 ppm for gas-fired and 96 ppm for oil-fired

6.3 Proposed Illinois Regulations

The Illinois EPA considered other states NO_x regulations, STAPPA/ALAPCO recommendations, and U.S. EPA guidance documents in its proposal to establish reasonable levels of NO_x controls for reciprocating engines and turbines in Illinois. Size thresholds for the units affected by the proposed regulation are based on their PTE for NO_x on an annual basis. The Illinois EPA is proposing to control NO_x emissions from sources in the nonattainment area for 8-hr ozone NAAQS that have a PTE of 100 TPY or more of NO_x aggregated from all the affected units at the source. The proposed regulation applies to RICE of 500 bhp capacities and above, and to stationary turbines of capacities equal to or greater than 3.5 MW located at these 100 TPY sources. The proposed amendments do not apply to emergency standby engines; engines used in research and testing for the purposes of performance verification and testing of engines;

engines/turbines used for agricultural purpose; and certain portable engines. Sources can avoid the proposed control requirement by staying below source-wide NO_x emissions of 100 TPY from all affected units or if the total operating rate for all affected engines is less than eight million bhp per year and all affected turbines is less than 20 thousand MW-hr per year.

The Illinois EPA relied upon the U.S. EPA's ACT [8,9], and STAPPA/ALAPCO guidance documents[7] to propose levels of controls for various types of units. All of the proposed controls levels are based on the retrofit techniques available for each category of affected unit. From review of the ACT and guidance documents and the comments received from the affected sources during outreach, the Illinois EPA determined that LEC controls on Worthington engines can achieve NO_x emissions of 308-420 ppmv as compared to other spark-ignited lean burn engine that can achieve NO_x emissions below 210 ppmv. Therefore, an average limit of 365 ppmv is proposed for Worthington engines. Although, post-combustion controls, such as SCR, are available and can achieve the greatest reductions, the proposed control levels do not require SCR as a compliance method.

Section 182(f) of the CAA introduced the requirement for existing major stationary sources of NO_x in NAAs to install and operate RACT to control NO_x emissions. The NO_x control levels proposed in this submittal are considered reasonable, attainable, and cost-effective. The NO_x emissions levels are prescribed in ppmv corrected to 15 percent O_2 on a dry basis. The NO_x limits for engines are 150 ppmv for spark-ignited rich-burn, 210 ppmv for spark-ignited lean-burn, 365 ppmv for Worthington engines and 660 ppmv for diesel engines and for turbines the NOx limits are 42 ppmv for gas-fired and 96 ppmv for liquid-fired. An owner or operator may comply with the control requirements by averaging the emissions of affected units that commenced operation on or before January 1, 2002, unless the unit is a replacement unit, in which case such a unit may be included even if it commenced operation after January 1, 2002. Compliance with the emission limits will be determined on both an ozone season (May 1, to September 30) and an annual (January 1 to December 31) basis each year. For units included in an averaging plan, and units using Continuous Emissions Monitoring Systems (CEMS), compliance with the emission limits must be demonstrated each year. For all other units,

compliance will be demonstrated on a periodic basis using stack tests and portable monitoring systems.

The Illinois EPA believes that most engines and turbines can reasonably achieve the proposed NO_x emission limitations. However, some engines or turbines may have difficulty in achieving the proposed limits. Therefore, The Illinois EPA is also proposing a NO_x emissions averaging option to assist sources in complying with the regulations. To take advantage of this flexible approach, a company must submit an emissions averaging plan which lists all of its units that will be included under this option. The total sum of the *actual* NO_x emissions from each engine or turbine in an averaging plan (based on stack tests results and annually monitored data) must be less than the total sum of the *allowable* NO_x emissions from those engine and turbines in the averaging plan based on the respective control level proposed. If sources, which are using an averaging plan, replace their fuel combusting units with electric motors, the allowable NO_x emissions from the affected units that were replaced should be used in the averaging calculations and the actual NO_x emissions for the electric motors are considered zero. The allowable NO_x emissions from the electric motor is determined by multiplying the total bhp-hrs generated by the motor (bhp rate of motor x operating hours) by the allowable NO_x emission rate of the replaced unit in lbs/mmBtu and converting the pounds of NO_x emissions using the factor of 0.00077 mmBtu/bhp-hr. The conversion factor was derived by using a standard conversion factor of one bhp-hr equals to 2545.1 Btu and engine thermal efficiency of 33%.

For a replacement unit which is not electric, the allowable NO_x emission rate to be used in the averaging plan prior to its compliance date will be the higher of the applicable uncontrolled NO_x emission rate from the U.S. EPA's AP-42 document or the actual NO_x emission rate as determined by testing or monitoring. On and after the applicable compliance date for the replacement unit, the allowable NO_x emission rate will be the allowable applicable NO_x emission concentration limit specified in the proposed rule.

For a unit that is replaced with purchased power, the allowable NO_x emission rate will be the applicable NO_x emissions concentration specified in the proposed rule. The actual hours of operation to be used will be the annual hours of operation for the replaced unit averaged over the

three-year period prior to the date of purchasing power. Purchased power units may be included in an emission averaging plan for no more than five years.

Tables 6-3 and 6-4 provide examples of how the proposed emissions averaging plan will work. Table 6-3 shows an example plan which includes four engines and one turbine. In this example, actual NO_x emissions of 812,965 pounds are greater than the allowable NO_x emissions of 804,666 pounds; therefore, the source is not in compliance with the proposed rule. Table 6-4 shows that by adjusting the operating hours of each engine and turbine, the actual NO_x emissions of 783,316 pounds, therefore the company achieves compliance without any penalty in fuel consumption and total bhp-hrs in a year.

Table 6-3
Example of Averaging Plan-Case 1

Engines	Rated bhp	Allow. NO_x Limit (ppm)	Actual NO_x Limit (ppm)	Fuel Use (mmBtu/yr)	Hours of Oper.	Bhpbhp-hrs x10^3	Allow. NO_x (lb)	Actual NO_x (lb)
Engine 1	3,000	150	175	127,500	5,000	15,000	70,456	82,199
Engine 2	3,500	210	220	148,750	5,000	17,500	115,078	120,558
Engine 3	4,000	660	700	170,000	5,000	20,000	436,121	462,553
Engine 4	4,500	210	150	191,250	5,000	22,500	147,958	105,684
Turbine 5	5,361	42	50	227,843	5,000	26,805	35,253	41,968
Total				865,343	25,000	101,805	804,866	812,962

Table 6-4
Example of Averaging Plan-Case 2

Engines	Rated bhp	Allow. NO_x Limit (ppm)	Actual NO_x Limit (ppm)	Fuel Use (mmBtu/yr)	Hours of Oper.	Bhp-hrs x10^3	Allow. NO_x (lb)	Actual NO_x (lb)
Engine 1	3,000	150	175	114,750	4,500	15,000	63,410	73,979
Engine 2	3,500	210	220	133,875	4,500	17,500	103,570	108,502
Engine 3	4,000	660	700	156,400	4,600	20,000	401,231	425,548
Engine 4	4,500	210	150	232,475	6,078	22,500	179,851	128,465
Turbine 5	5,361	42	50	227,843	5,000	26,805	35,253	41,968
Total				865,343	24,678	101,805	783,316	778,463

An owner or operator of any affected engine or turbine located in Cook, DuPage, Grundy, Kane, Kendall, Lake, McHenry, Will, Jersey, Madison, Monroe, Randolph, or St. Clair counties (NAA

counties) are required to comply with the rule by May 1, 2010. This compliance date, although later than the date required by U.S. EPA for NO_x RACT, was chosen to allow companies the ability to schedule equipment installations in a timely manner after promulgation of this proposed rule.

The proposed regulations provides for the limited use of CAIR NO_x allowances to comply with the emission limitations. The use of CAIR NO_x allowances are limited to documented unforeseen or anomalous operating scenarios inconsistent with historical operations for a particular ozone season or calendar year. This compliance option cannot be used more than twice in any five-year rolling period. The owner or operator shall surrender one NO_x allowance for each ton or portion of a ton of NO_x emissions on an annual basis by which actual emissions exceed allowed emissions.

An owner or operator of an engine or a turbine subject to the proposed control limits shall perform a compliance performance test once every five years to demonstrate compliance with the rule. All affected units must be tested once every five years thereafter. Section 217.394 of the proposal provides methods and procedures for testing and monitoring of the performance of an affected unit. The test methods provided are approved by U.S. EPA as set forth in 40 CFR 60.

7.0 Potentially Affected Sources

To determine potentially affected engines and turbines, the Illinois EPA reviewed its 2004 inventory of RICE and turbines. The Illinois EPA identified a total of 541 RICE and 220 turbines located in the NAAs that have the potential to be affected by the proposed regulations. Some of these units will be regulated under the new Subpart Q. A list of potentially impacted sources is included in Attachment A of this TSD.

Current Illinois regulations do not require sources to obtain permits to operate RICE with a capacity of less than 1,500 bhp. Therefore, the Illinois NOx inventory does not include all the engines from 500 to 1,500 bhp that may be affected by this proposal. To identify potentially affected sources and to estimate NO_x emissions reductions from sources, with smaller engines, the, the Illinois EPA, with the assistance of the Department of Commerce and Economic Opportunity (DCEO), conducted a statewide survey of industries and businesses and mailed 10,025 survey forms to determine how many engines in the 500 to 1,500 bhp size range are in Illinois. Out of 10,025 surveys, only 458 were returned and, of those, only 8 reported having RICE in the range of 500 to 1,500 bhp. Assuming the same proportion of affected engines per number of responses applies to those that did not respond to the survey, the Illinois EPA estimates that there are approximately 175 units that have the potential to be affected by the proposed rule. The Illinois EPA further assumed that many of these units would qualify for exemptions and therefore, only approximately 8 engines would be impacted by this proposal. Table 7-1 summarizes the number of impacted sources estimated by the Illinois EPA that are less than 1,500 bhp.

Table 7-1

Number of Affected Sources

Unit Type	Potentially Affected	Impacted
Illinois EPA Permitted IC Engines	541	55
Turbines	220	58
IC Engines ≥ 500 bhp & < 1,500 bhp	79	8
Total	840	121

8.0 NO_x Emissions Reductions

As described in Section 7 the Illinois EPA estimated that the total 2004 NO_x emissions from the 55 RICE and 58 turbines potentially affected by this proposal to be 2,514 TPY and 1,235 tons per ozone season. The Illinois EPA applied an 82 percent control level to gas-fired engines, 25 percent control efficiency to diesel engines, and 60 percent control efficiency to turbines to estimate NO_x emissions reductions from the proposed rule. No control was applied to a turbine which is subject to NSPS for NO_x emissions. The proposed rule will achieve estimated NO_x emissions reductions from affected sources of 1,669 TPY and 814 tons per ozone season from RICE in the Illinois EPA's inventory and turbines greater than 3.5 MW as shown in Table 8-1.

Table 8-1

Estimated NO_x Emissions Reductions from Affected RICE

Year	Uncontrolled NO_x		NO_x Emissions Reductions	
	(TPY)	(tons/season)	(TPY)	(tons/season)
Illinois EPA Permitted RICE	1,198	528	983	433
Turbines	1,316	706	686	381
Small units	593	247	486	203
Total	3,107	1,481	2,155	1,017

To estimate NO_x emissions reductions from the smaller RICE, between 500 bhp and 1,500 bhp, the Illinois EPA assumed the average capacity of the impacted RICE to be 1,000 bhp and the estimated operating schedule to be 4,000 hours per year. At a NO_x emission rate of 16.8 g/bhp-hr, the estimated 2004 NOx emissions were determined to be 593 tons NO_x per year and 247 tons per ozone season.. At a control efficiency of 82 percent, the NOx reduction from these engines will be 486 TPY and 203 tons per ozone season. Table 8-1 shows the estimated NO_x emissions reductions from "small units" with their corresponding total NO_x emissions reductions. As shown in Table 8-1, this proposal will provide NO_x emissions reductions of 2,155 TPY and 1,017 tons per ozone season when fully implemented in 2010.

9.0 Summary

This TSD presents the rationale, the documentation, and the methodology used by the Illinois EPA in the development of its proposed regulation to control NO_x emissions from reciprocating internal combustion engines and turbines. NO_x emissions are a contributor to fine particulate matter and ozone levels in areas of Illinois that are designated as nonattainment areas for these pollutants. The proposed regulation is being submitted to the Illinois Pollution Control Board to satisfy the requirements of the CAA to implement RACT on these source categories. Illinois EPA is in the process of developing regulations to control other NO_x source categories, as needed, to satisfy the CAA requirement for NO_x RACT.

The Illinois EPA is proposing to control NO_x emissions from sources in the NAA that have a PTE of 100 TPY or more of NO_x aggregated from all the affected units at the source. The proposed regulation applies to RICE of 500 bhp capacities and above, and to stationary turbines of capacities equal to or greater than 3.5 MW. The proposed regulation does not apply to emergency standby engines; engines used in research and testing for the purposes of performance verification and testing of engines; engines/turbines used for agricultural purposes; and certain portable engines. Sources can avoid the proposed control requirement by staying below source-wide NO_x emission levels of 100 TPY from all affected units or by operating all affected engines less than eight million bhp-hr/year and all affected turbines less than 20,000 MW-hr/year.

All affected engines and turbines are required to comply with the rule by May 1, 2010. From outreach discussions, this approach was recommended to help alleviate anticipated equipment and material delays, as well as demands on technical staffing needed for installation and testing of new controls, without sacrificing critical emission reductions.

The Illinois EPA proposal includes a NO_x emissions averaging option to assist sources in complying with the regulations. To take advantage of this flexible approach, a company must submit an averaging plan which lists all of its units that will be included under this option. The total sum of the actual NO_x emissions from each engine or turbine in an averaging plan (based on

stack tests results and annually monitored data) must be less than the total sum of the allowable NO_x emissions from those engine and turbines in the averaging plan based on the respective control level proposed.

The proposed regulation will impact approximately 63 RICE and 58 turbines in Illinois when fully implemented in 2010. When fully implemented, the proposed rule will reduce the NO_x emissions from RICE by approximately 1,469 TPY and 636 tons per ozone control season at a cost effectiveness of $319 to $2,575 per ton of NO_x (in 2004 dollars). Emissions from gas turbines will be reduced by approximately 686 TPY and 381 tons per ozone season at a cost effectiveness of $314 to $3,005 per ton of NO_x (in 2004 dollars).

10.0 References

1. National Ambient Air Quality Standards for Ozone, 62 *FR* 38855, July 18, 1997, (Ozone Standards).

2. National Ambient Air Quality Standards for Particulate Matter, 62 *FR* 38652, July 18, 1997, ($PM_{2.5}$ Standards).

3. Air Quality Designations and Classifications for fine Particles ($PM_{2.5}$) National Ambient Air Quality Standards, 70 *FR* 943, January 5, 2005.

4. 8-hour Ozone National Ambient Air Quality Standards, 69 *FR* 23858, April 30, 2004.

5. Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard, 70 *FR* 71612, November 29, 2005.

6. Clean Air Fine Particle Implementation; Final Rule, 40 C*FR Part 51*, April 25, 2007
.
7. Controlling Nitrogen Oxides Under the Clean Air Act: A Menu of Options, July 1994, State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials.

8. Alternative Control Techniques Document--NOx Emissions from Stationary Reciprocating Internal Combustion Engines EPA-453/R-93-032, July 1993, U.S. EPA, OAQPS, RTP, NC 27711.

9. Alternative Control Techniques Document – NOx Emissions from Stationary Gas Turbines, EPA-453/R-93-007, January 1993, U.S. EPA, OAQPS, Research Triangle Park, NC 27711

10. Stationary Reciprocating Internal Combustion Engines, Updated Information on NOx Emissions and Control Techniques, Revised Final Report, EPA Contract No. 68-D-026, Work Assignment No. 2-28,EC/R Project No. ISD-228, September 1, 2000
.
11. Texas Administrative Code. Title 30, Rule 106.512: Stationary Engines and Turbines

12. Indiana Department of Environmental Management, Office of Air Quality, Section 9.326 IAC 10-5. Rule 5 Nitrogen Oxide Reduction Program for Internal Combustion Engines (ICE).

13. Document Prepared by the State of Connecticut, Department of Environmental Protection. Sec. 22a-174-22 Control of Nitrogen Oxides Emissions
.
14. Alabama Department of Environmental Management. Air Division, Chapter 335-3-8, Nitrogen Oxides Emissions.

15. New York State, Department of Environmental Conservation Rule and Regulations, Subpart 227.2, Reasonable Available Control Technology (RACT) for Oxides of Nitrogen (NOx).

16. New Jersey State Department of Environmental Protection, New Jersey Administrative Code Title 7, Chapter 27, Subchapter 19: Control and Prohibition of Air Pollution from Oxides of Nitrogen.

17. Pennsylvania Department of Environmental Protection, Air Quality Regulations, Small Source of NOx Cement Kilns and Large Internal Combustion Engines, 25 PA Code CHS 121,129 and 145.

18. Code of Maryland Regulations. Title 26 Department of the Environment. Subtitle 11 Air Quality, Chapter 09: Control of Fuel-Burning Equipment, Stationary Internal Combustion Engines, and Certain Fuel-Burning Installation.

19. Antelope Valley Air Quality Management District. Rule 1110.2: Emissions from Stationary, Non-Road & Portable Internal Combustion Engines.

20. San Joaquin Valley Unified Air Pollution Control District Rule 4702: Internal Combustion Engines – Phase 2.

21. El Dorado County Air Pollution Control District Rule 233: Stationary Internal Combustion Engines.

22. Interstate Ozone Transport: Response to Court Decisions on the NOx SIP Call, NOx SIP Call Technical Amendments, and Section 126 Rules; Final Rule. 69 FR 21603, April 21, 2004.

23. South Coast Air Quality Management District, Rule 1134 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines.

Attachment A

List of Impacted RICE and Turbines

List of Impacted RICE

Id Number	Plant Name	Emission Point	No. of Units
031600ATR	International Malting Company - United States	0011	2
031600ATR	International Malting Company - United States	0014	2
031600ATR	International Malting Company - United States	0012	2
031600CEV	University of Illinois At Chicago	0009	1
031600CEV	University of Illinois At Chicago	0010	1
031600CEV	University of Illinois At Chicago	0011	2
043065ADG	Nicor Gas	0003	4
097200ABC	Bio Energy (Illinois) LLC	0001	1
097200ABC	Bio Energy (Illinois) LLC	0002	1
097200ABC	Bio Energy (Illinois) LLC	0003	1
097200ABC	Bio Energy (Illinois) LLC	0004	1
097200ABC	Bio Energy (Illinois) LLC	0005	1
097811AAC	Naval Training Center	0050	2
097811AAC	Naval Training Center	0095	5
097811AAC	Naval Training Center	0055	6
097811AAC	Naval Training Center	0097	2
097811AAC	Naval Training Center	0108	2
097811AAC	Naval Training Center	0107	2
097811AAC	Naval Training Center	0106	2
097811AAC	Naval Training Center	0049	1
111816AAA	ANR Pipeline Co	0010	1
111816AAA	ANR Pipeline Co	0022	1
111816AAA	ANR Pipeline Co	0024	1
111816AAA	ANR Pipeline Co	0025	1
111816AAA	ANR Pipeline Co	0030	1
111816AAA	ANR Pipeline Co	0029	1
163050AAD	Milam Recycling and Disposal Facility	0012	3
197800ABU	Trunkline Gas Co	0001	5
Total RICE			**55**

List of Impacted Turbines

Id Number	Plant Name	Emission Point	No. of Units
031003ADA	Alsip Paper Condominium Assn	0002	1
197817AAA	Natural Gas Pipeline Co of America	0016	9
197817AAA	Natural Gas Pipeline Co of America	0020	10
031600AMJ	Midwest Generation LLC	0003	11
031600GKE	Calumet Peaking Facility	0001	8
097200ABB	Zion Energy Center	0001	3
197800AAA	Exxon Mobil	0043	1
197808AAG	Elwood Energy Facility	0007	3
197899AAC	PPL University Park LLC	0001	1
197899AAC	PPL University Park LLC	0002	1
197899AAC	PPL University Park LLC	0003	1
197899AAC	PPL University Park LLC	0004	1
197899AAC	PPL University Park LLC	0005	1
197899AAC	PPL University Park LLC	0006	1
197899AAC	PPL University Park LLC	0007	1
197899AAC	PPL University Park LLC	0008	1
197899AAC	PPL University Park LLC	0009	1
197899AAC	PPL University Park LLC	0010	1
197899AAC	PPL University Park LLC	0011	1
197899AAC	PPL University Park LLC	0012	1
Total Turbines			**58**

Agency Analysis of Economic and Budgetary Effects of Proposed Rulemaking

Agency: Illinois Pollution Control Board

Part/Title: Permits And General Provisions (35 Ill. Adm. Code Part 201.146)

Illinois Register Citation: _____

Please attempt to provide as dollar-specific responses as possible and feel free to add any relevant explanation.

1. Anticipated effect on State expenditures and revenues.

   (a) Current cost to the agency for this program/activity. **$0 per year** (approximately)

   (b) If this rulemaking will result in an increase or decrease in cost, specify the fiscal year in which this change will first occur and the dollar amount of the effect.
   2010, the annual cost increase of approx. $50,000 per year

   (c) Indicate the funding source, including Fund and appropriation lines, for this program/activity. **Clean Air Act Permit Program Fund (CAAPP)**

   (d) If an increase or decrease in the costs of another State agency is anticipated, specify the fiscal year in which this change will first occur and the estimated dollar amount of the effect. **N/A**

   (e) Will this rulemaking have any effect on State revenues or expenditures not already indicated above? **No**

2. Economic effect on persons affected by the rulemaking:

   (a) Indicate the economic effect and specify the persons affected:

   Positive ___ Negative ____ No effect _**X**__

   Persons affected: __owners and operators of certain stationary internal combustion engines and turbines__ ____

   Dollar amount per person: _**0**_

   Total statewide cost: ___**0**___ _____

(b) If an economic effect is predicted, please briefly describe how the effect will occur. **_N/A__ ____**

(c) Will the rulemaking have an indirect effect that may result in increased administrative costs? **No** Will there be any change in requirements such as filing, documentation, reporting or completion of forms?

The rulemaking should have no indirect effect that may result in increased administrative costs.

Agency Analysis of Economic and Budgetary Effects of Proposed Rulemaking

Agency: Illinois Pollution Control Board

Part/Title: Definitions and General Provisions (35 Ill. Adm. Code Part 211)

Illinois Register Citation: _____

Please attempt to provide as dollar-specific responses as possible and feel free to add any relevant explanation.

1. Anticipated effect on State expenditures and revenues.

   (a) Current cost to the agency for this program/activity. **$ 0 per year** (approximately)

   (b) If this rulemaking will result in an increase or decrease in cost, specify the fiscal year in which this change will first occur and the dollar amount of the effect.
   N/A

   (c) Indicate the funding source, including Fund and appropriation lines, for this program/activity. **N/A**

   (d) If an increase or decrease in the costs of another State agency is anticipated, specify the fiscal year in which this change will first occur and the estimated dollar amount of the effect. **N/A**

   (e) Will this rulemaking have any effect on State revenues or expenditures not already indicated above? **No**

2. Economic effect on persons affected by the rulemaking:

   (a) Indicate the economic effect and specify the persons affected:

   Positive ___ Negative ____ No effect **_X**

   Persons affected: __Owners and operators of affected stationary internal combustion engines and turbines

   Dollar amount per person: **__0_**

   Total statewide cost: ____**0**

   (b) If an economic effect is predicted, please briefly describe how the effect will occur. **N/A**

(c) Will the rulemaking have an indirect effect that may result in increased administrative costs? **No** Will there be any change in requirements such as filing, documentation, reporting or completion of forms? **No**

The rulemaking should have no indirect effect that may result in increased administrative costs.

Agency Analysis of Economic and Budgetary Effects of Proposed Rulemaking

Agency: Illinois Pollution Control Board

Part/Title: Nitrogen Oxides Emissions (35 Ill. Adm. Code Part 217)

Illinois Register Citation: _____

Please attempt to provide as dollar-specific responses as possible and feel free to add any relevant explanation.

1. Anticipated effect on State expenditures and revenues.

   (a) Current cost to the agency for this program/activity. **$ 0 per year** (approximately)

   (b) If this rulemaking will result in an increase or decrease in cost, specify the fiscal year in which this change will first occur and the dollar amount of the effect.
   2010, the annual cost increase of approx. $75,000 per year

   (c) Indicate the funding source, including Fund and appropriation lines, for this program/activity. **Clean Air Act Permit Program Fund (CAAPP)**

   (d) If an increase or decrease in the costs of another State agency is anticipated, specify the fiscal year in which this change will first occur and the estimated dollar amount of the effect. **n/a**

   (e) Will this rulemaking have any effect on State revenues or expenditures not already indicated above? **no**

2. Economic effect on persons affected by the rulemaking:

   (a) Indicate the economic effect and specify the persons affected:

   Positive ___ Negative __**X**__ No effect _ __

   Persons affected: **__owners and operators of affected stationary internal combustion engines**

   Dollar amount per person: **_$314 to $3,005 average annual cost per ton of NOx reduced__**

   Total statewide cost: **__$677,000 to $6,476,000_per year**

(b) If an economic effect is predicted, please briefly describe how the effect will occur. **_The cost to install and to maintain required air pollution control equipment.**

(c) Will the rulemaking have an indirect effect that may result in increased administrative costs? Will there be any change in requirements such as filing, documentation, reporting or completion of forms?

The rulemaking should have no indirect effect that may result in increased administrative costs.

Federal Register

Wednesday,
April 25, 2007

Part II

Environmental Protection Agency

40 CFR Part 51

Clean Air Fine Particle Implementation Rule; Final Rule

Agency Information Collection Activities: Proposed Collection; Comment Request; $PM_{2.5}$ Ozone National Ambient Air Quality Standard Implementation Rule; EPA ICR No. 2258.01; Notice

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 51

[EPA–HQ–OAR–2003–0062; FRL–8295–2]

RIN 2060–AK74

Clean Air Fine Particle Implementation Rule

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This final action provides rules and guidance on the Clean Air Act (CAA) requirements for State and Tribal plans to implement the 1997 fine particle ($PM_{2.5}$) national ambient air quality standards (NAAQS). Fine particles and precursor pollutants are emitted by a wide range of sources, including power plants, cars, trucks, industrial sources, and other burning or combustion-related activities. Health effects that have been associated with exposure to $PM_{2.5}$ include premature death, aggravation of heart and lung disease, and asthma attacks. Those particularly sensitive to $PM_{2.5}$ exposure include older adults, people with heart and lung disease, and children.

Air quality designations became effective on April 5, 2005 for 39 areas (with a total population of 90 million) that were not attaining the 1997 $PM_{2.5}$ standards. By April 5, 2008, each State having a nonattainment area must submit to EPA an attainment demonstration and adopted regulations ensuring that the area will attain the standards as expeditiously as practicable, but no later than 2015. This rule and preamble describe the requirements that States and Tribes must meet in their implementation plans for attainment of the 1997 fine particle NAAQS. (Note that this rule does not include final $PM_{2.5}$ requirements for the new source review (NSR) program; the final NSR rule will be issued at a later date.)

DATES: This rule is effective on May 29, 2007.

ADDRESSES: The EPA has established a docket for this action under Docket ID EPA–HQ–OAR–2003–0062. All documents relevant to this action are listed in the Federal docket management system at *www.regulations.gov*. Although listed in the index, some information is not publicly available (e.g. Confidential Business Information or other information whose disclosure is restricted by statute). Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through www.regulations.gov or in hard copy format at the EPA Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Avenue, NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Office of Air and Radiation Docket and Information Center is (202) 566–1742. A variety of information and materials related to the fine particle NAAQS and implementation program are also available on EPA's Web site: *http://www.epa.gov/air/particles*.

FOR FURTHER INFORMATION CONTACT: For general information, contact Mr. Richard Damberg, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Mail Code C539–01, Research Triangle Park, NC 27711, phone number (919) 54l–5592 or by e-mail at: *damberg.rich@epa.gov*.

SUPPLEMENTARY INFORMATION:

General Information

A. Does this action apply to me?

Entities potentially regulated by this action are State and local air quality agencies.

B. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this final rule will also be available on the World Wide Web. Following signature by the EPA Administrator, a copy of this final rule will be posted at *http://www.epa.gov/particles/actions.html*.

C. How is the preamble organized?

I. Background

Fine particles in the atmosphere are comprised of a complex mixture of components. Common constituents include: sulfate (SO_4); nitrate (NO_3); ammonium; elemental carbon; a great variety of organic compounds; and inorganic material (including metals, dust, sea salt, and other trace elements) generally referred to as ''crustal'' material, although it may contain material from other sources. Airborne particles generally less than or equal to 2.5 micrometers in diameter are considered to be ''fine particles'' (also referred to as $PM_{2.5}$). (A micrometer is one-millionth of a meter, and 2.5 micrometers is less than one-seventh the average width of a human hair.) ''Primary'' particles are emitted directly into the air as a solid or liquid particle (e.g., elemental carbon from diesel engines or fire activities, or condensable organic particles from gasoline engines). ''Secondary'' particles (e.g., sulfate and nitrate) form in the atmosphere as a result of various chemical reactions. (Section II of the proposed rule included detailed technical discussion on $PM_{2.5}$, its precursors, formation processes, and emissions sources.)

The EPA established air quality standards for $PM_{2.5}$ based on evidence from numerous health studies demonstrating that serious health effects are associated with exposures to elevated levels of $PM_{2.5}$. Epidemiological studies have shown statistically significant correlations between elevated $PM_{2.5}$ levels and premature mortality. Other important

effects associated with $PM_{2.5}$ exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), changes in lung function and increased respiratory symptoms, as well as new evidence for more subtle indicators of cardiovascular health. Individuals particularly sensitive to $PM_{2.5}$ exposure include older adults, people with heart and lung disease, and children.

On July 18, 1997, we revised the NAAQS for particulate matter (PM) to add new standards for fine particles, using $PM_{2.5}$ as the indicator. We established health-based (primary) annual and 24-hour standards for $PM_{2.5}$ (62 FR 38652).[1] The annual standard was set at a level of 15 micrograms per cubic meter, as determined by the 3-year average of annual mean $PM_{2.5}$ concentrations. The 24-hour standard was set at a level of 65 micrograms per cubic meter, as determined by the 3-year average of the 98th percentile of 24-hour concentrations.

Attainment of the 1997 $PM_{2.5}$ standards is estimated to lead to reductions in health impacts, including tens of thousands fewer premature deaths each year, thousands fewer hospital admissions and emergency room visits each year, hundreds of thousands fewer absences from work and school, and hundreds of thousands fewer respiratory illnesses in children annually. The EPA's evaluation of the science concluded that there was not sufficient information to either support or refute the existence of a threshold for health effects from PM exposure.[2]

We subsequently completed in October 2006 another review of the NAAQS for PM. With regard to the primary standards, the 24-hour $PM_{2.5}$ standard was strengthened to a level of 35 micrograms per cubic meter, based on the 3-year average of the 98th percentile of 24-hour concentrations, and the level of the annual standard remained unchanged.[3] Attainment of the 2006 $PM_{2.5}$ standards is estimated to lead to additional reductions in health impacts, including approximately 1,200 to 13,000 fewer premature deaths each year, 1,630 fewer hospital admissions and 1,200 fewer emergency room visits for asthma each year, 350,000 fewer absences from work and school, and 155,300 fewer respiratory illnesses in children annually.[4]

In both 1997 and 2006 EPA established welfare-based (secondary) standards identical to the levels of the primary standards. The secondary standards are designed to protect against major environmental effects of $PM_{2.5}$ such as visibility impairment, soiling, and materials damage. The EPA also established the regional haze regulations in 1999 for the improvement of visual air quality in national parks and wilderness areas across the country. Because regional haze is caused primarily by light scattering and light absorption by fine particles in the atmosphere, EPA is encouraging the States to integrate their efforts to attain the $PM_{2.5}$ standards with those efforts to establish reasonable progress goals and associated emission reduction strategies for the purposes of improving air quality in our treasured natural areas under the regional haze program.

The scientific assessments used in the development of the $PM_{2.5}$ standards included a scientific peer review and public comment process. We developed scientific background documents based on the review of hundreds of peer-reviewed scientific studies. The Clean Air Scientific Advisory Committee, a congressionally mandated group of independent scientific and technical experts, provided extensive review of these assessments, and found that EPA's review of the science provided an adequate basis for the EPA Administrator to make a decision. More detailed information on health effects of $PM_{2.5}$ can be found on EPA's Web site at: *http://www.epa.gov/air/urbanair/pm/index.html.* Additional information on EPA's scientific assessment documents supporting the 1997 standards are available at *http://www.epa.gov/ttn/oarpg/t1cd.html*; additional scientific assessment information on the 2006 standards is available at: *http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_cr_cd.html.*

The EPA issued final $PM_{2.5}$ designations for areas violating the 1997 standards on December 17, 2004. They were published in the **Federal Register** on January 5, 2005 (70 FR 944). On April 5, 2005, EPA issued a supplemental notice which changed the designation status of eight areas from nonattainment to attainment based on newly updated 2002–2004 air quality data (70 FR 19844; published in the **Federal Register** on April 14, 2005). A total of 39 areas were designated as nonattainment for the 1997 $PM_{2.5}$ standards. The population of these areas is estimated at about 90 million (or more than 30% of the U.S. population). Most of these areas only violate the annual standard, but a few violate both the annual and 24-hour standards.

The nonattainment designation for an area starts the process whereby a State or Tribe must develop an implementation plan that includes, among other things, a demonstration showing how it will attain the ambient standards by the attainment dates required in the CAA. Under section 172(b), States have up to 3 years after EPA's final designations to submit their SIPs to EPA. These SIPs will be due on April 5, 2008, 3 years from the effective date of the designations.

Section 172(a)(2) of the Act requires States to attain the standards as expeditiously as practicable but within 5 years of designation (i.e. attainment date of April 2010 based on air quality data for 2007–2009), or within up to 10 years of designation (i.e. to April 2015) if the EPA Administrator extends an area's attainment date by 1–5 years based upon the severity of the nonattainment problem or the feasibility of implementing control measures.

Virtually all nonattainment problems appear to result from a combination of local emissions and transported emissions from upwind areas. The structure of the CAA requires EPA to develop national rules for certain types of sources which are also significant contributors to local air quality problems, including motor vehicles and fuels. It also provides for States to address emissions sources on an area-specific basis through such requirements as RACT, RACM, and RFP.

We believe that to attain the $PM_{2.5}$ standards, it is important to pursue emissions reductions simultaneously on the local, regional, and national levels. The EPA issued the Clean Air Interstate

[1] The original annual and daily standards for particles generally less than or equal to 10 micrometers in diameter (also referred to as PM_{10}) were established in 1987. In the 1997 PM NAAQS revision, EPA also revised the standards for PM_{10}, but these revised PM_{10} standards were later vacated by the court, and the 1987 PM_{10} standards remained in effect. In the 2006 NAAQS revision, the 24-hour PM_{10} standard was retained but the annual standard was revoked. Today's implementation rule and guidance does not address PM_{10}.

[2] Environmental Protection Agency. (2004a). Air Quality Criteria for Particulate Matter. Research Triangle Park, NC: National Center for Environmental Assessment—RTP, Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; report no. EPA/600/P–99/002aF and EPA/600/P–99/002bF. October 2004.

[3] The revised fine particle NAAQS were published on October 17, 2006 (71 FR 61144). See EPA's Web site for additional information: *http://www.epa.gov/pm/index.html.*

[4] Regulatory Impact Analysis for Particulate Matter National Ambient Air Quality Standards (September 2006), page ES–8. The mortality range includes estimates based on the results of an expert elicitation study, along with published epidemiological studies.

Rule (CAIR) [5] on March 10, 2005 to address the interstate transport of sulfur dioxide and nitrogen oxide emissions primarily from power plants. Section 110 gives EPA the authority to require SIPs to ''prohibit * * * any source or other type of emission activity within the State from emitting any air pollutant in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to'' any NAAQS, and to prohibit sources or emission activities from emitting pollutants in amounts which will interfere with measures required to be included in State plans to prevent significant deterioration of air quality or to protect visibility (such as the protection of 156 mandatory Federal class I areas under the regional haze rule [6]). CAIR employs the same emissions trading approach used to achieve cost-effective emission reductions under the acid rain program. It outlines a two-phase program with increasingly tighter power plant emissions caps for 28 eastern states and the District of Columbia: SO_2 caps of 3.6 million tons in 2010, and 2.5 million in 2015; NO_X caps of 1.5 in 2009 and 1.3 in 2015; and NO_X ozone season caps of 580,000 tons in 2009 and 480,000 tons in 2015. Emission caps are divided into State SO_2 and NO_X budgets. By the year 2015, the Clean Air Interstate Rule is estimated to result in:

—$85 to $100 billion in annual health benefits, including preventing 17,000 premature deaths, millions of lost work and school days, and tens of thousands of non-fatal heart attacks and hospital admissions annually.
—Nearly $2 billion in annual visibility benefits in southeastern national parks, such as Great Smoky and Shenandoah.
—Significant regional reductions in sulfur and nitrogen deposition, reducing the number of acidic lakes and streams in the eastern U.S.

Over the past several years, EPA has also issued a number of regulations addressing emissions standards for new cars, trucks and buses. These standards are providing reductions in motor vehicle emissions of volatile organic compounds (VOCs, also referred to as hydrocarbons), NO_X, and direct PM emissions (such as elemental carbon) as older vehicles are retired and replaced. Other existing rules are designed to reduce emissions from several categories of nonroad engines. The Tier 2 motor vehicle emission standards, together with the associated requirements to reduce sulfur in gasoline, are estimated to provide additional benefits nationally beginning in 2004.[7] When the new tailpipe and sulfur standards are fully implemented, Americans are estimated to benefit from the clean-air equivalent of removing 164 million cars from the road. These new standards require passenger vehicles to have emissions 77 to 95 percent cleaner than those on the road today and require fuel manufacturers to reduce the sulfur content of gasoline by up to 90 percent. In addition, the 2001 heavy-duty diesel engine regulations [8] will lead to continued emissions reductions as older vehicles in that engine class are retired and fleets turn over. New emission standards began to take effect for model year 2007 and apply to heavy-duty highway engines and vehicles. These standards are based on the use of high-efficiency catalytic exhaust emission control devices or comparably effective advanced technologies. Because these devices are damaged by sulfur, the level of sulfur in highway diesel fuel was to be reduced by 97 percent by mid-2006. We project a 2.6 million ton reduction of NO_X emissions in 2030 when the current heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards. By 2030, we estimate that this program will reduce annual emissions of hydrocarbons by 115,000 tons and PM by 109,000 tons. These emissions reductions are on par with those that we anticipate from new passenger vehicles and low sulfur gasoline under the Tier 2 program.

The EPA also finalized national rules in May 2004 to reduce significantly $PM_{2.5}$ and NO_X emissions from nonroad diesel-powered equipment.[9] These nonroad sources include construction, agricultural, and industrial equipment, and their emissions constitute an important fraction of the inventory for direct $PM_{2.5}$ emissions (such as elemental carbon and organic carbon), and NO_X. The EPA estimates that affected nonroad diesel engines currently account for about 44 percent of total diesel PM emissions and about 12 percent of total NO_X emissions from mobile sources nationwide. These proportions are even higher in some urban areas. The diesel emission standards will reduce emissions from this category by more than 90 percent, and are similar to the onroad engine requirements implemented for highway trucks and buses. Because the emission control devices can be damaged by sulfur, EPA also established requirements to reduce the allowable level of sulfur in nonroad diesel fuel by more than 99 percent by 2010. In 2030, when the full inventory of older nonroad engines has been replaced, the nonroad diesel program will annually prevent up to 12,000 premature deaths, one million lost work days, 15,000 heart attacks and 6,000 children's asthma-related emergency room visits.

The EPA expects the implementation of regional and national emission reduction programs such as CAIR and the suite of mobile source rules described above to provide significant air quality improvements for $PM_{2.5}$ nonattainment areas. At the same time, analyses for the final CAIR rule indicate that without implementation of local measures, a number of $PM_{2.5}$ areas are projected to remain in nonattainment status in the 2010–2015 timeframe. Thus, EPA believes that local and State emission reduction efforts will need to play an important role in addressing the $PM_{2.5}$ problem as well. The EPA will work closely with States, Tribes, and local governments to develop appropriate in-state pollution reduction measures to complement regional and national strategies to meet the standards expeditiously and in a cost-effective manner. States will need to evaluate technically and economically feasible emission reduction opportunities and determine which measures can be reasonably implemented in the near term. Local and regional emission reduction efforts should proceed concurrently and expeditiously.

The promulgation of a revised 24-hour $PM_{2.5}$ standard effective on December 18, 2006 has initiated another process of State recommendations, and the eventual designation by EPA of areas not attaining the revised standard. The additional designations are to be completed within two years from the effective date, although EPA may take an additional year to complete the designations if it determines it does not have sufficient information. State plans to attain the 24-hour standard would then be due within three years of the final designations. A number of areas, including some that are already designated as not attaining the 1997 standards, may be exceeding the revised 24-hour standard. The EPA encourages State and local governments to be mindful of the strengthened 24-hour standard as they adopt emission reduction strategies to attain the 1997 standards. Such steps may help with

[5] See *http://www.epa.gov/cair.*

[6] See 64 FR 35714, July 1, 1999.

[7] See Tier II emission standards at 65 FR 6698, February 10, 2000.

[8] See heavy-duty diesel engine regulations at 66 FR 5002, January 18, 2001.

[9] For more information on the proposed nonroad diesel engine standards, see EPA's Web site: *http://www.epa.gov/nonroad/.*

future attainment efforts, or even help some areas avoid a nonattainment designation for the 24-hour standard in the first place.

The public health benefits of meeting the $PM_{2.5}$ standards are estimated to be significant. Even small reductions in $PM_{2.5}$ levels may have substantial health benefits on a population level. For example, in a moderate-sized metropolitan area with a design value of 15.5 µg/m3, efforts to improve annual average air quality down to the level of the standard (15.0 µg/m3) are estimated to result in as many as 25–50 fewer mortalities per year due to air pollution exposure. In a smaller city, the same air quality improvement from 15.5 to 15.0 µg/m3 still are estimated to result in a number of avoided mortalities per year. These estimates are based on EPA's standard methodology for calculating health benefits as used in recent rulemakings.[10] In addition, because many different precursors contribute to the formation of fine particles, reductions in pollutants that contribute to $PM_{2.5}$ also can provide concurrent benefits in addressing a number of other air quality problems—such as ground-level ozone, regional haze, toxic air pollutants, and urban visibility impairment.

In order to assist States in developing effective plans to address the local component of the $PM_{2.5}$ nonattainment problem, EPA is issuing this final fine particle implementation rule. The EPA is issuing this rule to implement the 1997 $PM_{2.5}$ NAAQS in accordance with the statutory requirements of the CAA set forth in Subpart 1 of Part D of Title 1, *i.e.*, sections 171–179B of the Act. The EPA believes that the CAA directs the Agency to implement new or revised NAAQS in nonattainment areas solely in accordance with Subpart 1, unless another Subpart of the Act also applies to the particular NAAQS at issue. In this case, EPA has concluded that Congress did not intend the Agency to implement particulate matter NAAQS other than those using PM_{10} as the indicator in accordance with Subpart 4 of Part D of Title 1, *i.e.*, sections 188–190 of the CAA. Moreover, EPA believes that implementation of the $PM_{2.5}$ NAAQS under the provisions of Subpart 1 is more appropriate, given the inherent nature of the $PM_{2.5}$ nonattainment problem. In contrast to PM_{10}, EPA anticipates that achieving the NAAQS for $PM_{2.5}$ will generally require States to evaluate different sources for controls, to consider controls of one or more precursors in addition to direct PM emissions, and to adopt different control strategies. As a result, EPA has concluded that the provisions of Subpart 1 will allow States and EPA to tailor attainment plans so that they can be based more specifically upon the facts and circumstances of each nonattainment area.

The proposed clean air fine particle implementation rule was issued on November 1, 2005 (70 FR 65984). About 100 comments were received from private citizens and parties representing industry, state and local governments, environmental groups, and federal agencies. Section II of this document describes the primary elements of the fine particle implementation program. Each section summarizes the relevant policies and options discussed in the proposed rule, discusses the final policy set forth by EPA in the final rule, and provides responses to the major comments received on each issue.

II. Elements of the Clean Air Fine Particle Implementation Rule

A. Precursors and Pollutants Contributing to Fine Particle Formation

1. Introduction

The main precursor gases associated with fine particle formation are SO_2, NO_X, volatile organic compounds (VOC), and ammonia. This section provides technical background on each precursor, discusses the policy approach for addressing each precursor under the $PM_{2.5}$ implementation program, and responds to key issues raised in the public comment process. A subsection is also included on direct $PM_{2.5}$ emissions to address key comments received on this issue as well.

Gas-phase precursors SO_2, NO_X, VOC, and ammonia undergo chemical reactions in the atmosphere to form secondary particulate matter. Formation of secondary PM depends on numerous factors including the concentrations of precursors; the concentrations of other gaseous reactive species; atmospheric conditions including solar radiation, temperature, and relative humidity (RH); and the interactions of precursors with preexisting particles and with cloud or fog droplets. Several atmospheric aerosol species, such as ammonium nitrate and certain organic compounds, are semivolatile and are found in both gas and particle phases. Given the complexity of PM formation processes, new information from the scientific community continues to emerge to improve our understanding of the relationship between sources of PM precursors and secondary particle formation.

As an initial matter, it is helpful to clarify the terminology we use throughout this notice to discuss precursors. We recognize NO_X, SO_2, VOCs, and ammonia as precursors of $PM_{2.5}$ in the scientific sense because these pollutants can contribute to the formation of $PM_{2.5}$ in the ambient air. In section II.K on emission inventory issues, we make the point that because of the complex and variable interaction of multiple pollutants and precursors in the formation of fine particles, it is important for States and EPA to continue to characterize and improve the emissions inventories for all $PM_{2.5}$ precursors. The States and EPA need to use the best available information available in conducting air quality modeling and other assessments. At the same time, the refinement of emissions inventories, the overall contribution of different fine particle precursors to $PM_{2.5}$ formation, and the efficacy of alternative potential control measures will vary by location. This requires that we further consider in this action how States should address these $PM_{2.5}$ precursors in their $PM_{2.5}$ attainment plan programs. Thus, we require emission inventories to include the best available information on all pollutants and precursors that contribute to $PM_{2.5}$ concentrations, and at same time we use the term ''$PM_{2.5}$ attainment plan precursor'' to describe only those precursors that are required to be evaluated for control strategies in a specific $PM_{2.5}$ nonattainment area or maintenance area plan.

In this rule, EPA has not made a finding that all precursors should be evaluated for possible controls in each specific nonattainment area. The policy approach in the rule instead requires sulfur dioxide to be evaluated for control measures in all areas, and describes general presumptive policies for NO_X, ammonia, and VOC for all nonattainment areas. The rule provides a mechanism by which the State and/or EPA can make an area-specific demonstration to reverse the general presumption for these three precursors. States must also consider any relevant information brought forward by interested parties in the SIP planning and development process. (See section II.A.8 for additional discussion on these issues.)

In the following sections, we discuss how States must evaluate $PM_{2.5}$ precursors for nonattainment program issues in $PM_{2.5}$ implementation plans,

[10] See: U.S. EPA 2006. Regulatory Impact Analysis for the Particulate Matter National Ambient Air Quality Standards. Air Benefits and Cost Group, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. October 6, 2006. Appendix A provides an analysis of estimated benefits and costs of attaining the 1997 PM NAAQS standards in 2015.

including issues such as RACT, RACM, and reasonable further progress. This discussion in the final rule is linked to precursor policies for the implementation of the new source review program, the transportation conformity program, the general conformity program, and the regional haze program. All of these programs take effect prior to approval of SIPs for attaining the $PM_{2.5}$ NAAQS. In the case of NSR, the program applies on the effective date of the nonattainment area designation. In the case of transportation conformity and general conformity, the program takes effect 1 year from the effective date of designation of the nonattainment area (i.e., April 5, 2006 for areas designated nonattainment effective April 5, 2005). Thus, for each of these programs there is an interim period between the date the program becomes applicable to a given nonattainment area and the date the State receives EPA approval of its overall $PM_{2.5}$ implementation plan.

2. Legal Authority to Regulate Precursors

a. Background

The CAA authorizes the Agency to regulate criteria pollutant precursors. The term ''air pollutant'' is defined in section 302(g) to include ''any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term 'air pollutant' is used.'' The first clause of this second sentence in section 302(g) explicitly authorizes the Administrator to identify and regulate precursors as air pollutants under other parts of the CAA. In addition, the second clause of the sentence indicates that the Administrator has discretion to identify which pollutants should be classified as precursors for particular regulatory purposes. Thus, we do not necessarily construe the CAA to require that EPA identify a particular precursor as an air pollutant for all regulatory purposes where it can be demonstrated that various CAA programs address different aspects of the air pollutant problem. Likewise, we do not interpret the CAA to require that EPA treat all precursors of a particular pollutant the same under any one program when there is a basis to distinguish between such precursors. For example, in a rule addressing $PM_{2.5}$ precursors for purposes of the transportation conformity program, we chose to adopt a different approach for one precursor based on the limited emissions of that precursor from onroad mobile sources and the degree to which it contributes to $PM_{2.5}$ concentrations. (70 FR 24280; May 6, 2005).

Other provisions of the CAA reinforce our reading of section 302(g) that Congress intended precursors to NAAQS pollutants to be subject to the air quality planning and control requirements of the CAA, but also recognized that there may be circumstances where it is not appropriate to subject precursors to certain requirements of the CAA. Section 182 of the CAA provides for the regulation of NO_X and VOCs as precursors to ozone in ozone nonattainment areas, but also provides in section 182(f) that major stationary sources of NO_X (an ozone precursor) are not subject to emission reductions controls for ozone where the State shows through modeling that NO_X reductions do not decrease ozone. Section 189(e) provides for the regulation of PM_{10} precursors in PM_{10} nonattainment areas, but also recognizes that there may be certain circumstances (e.g. if precursor emission sources do not significantly contribute to PM_{10} levels) where it is not appropriate to apply control requirements to PM_{10} precursors. The legislative history of Section 189(e) recognized the complexity behind the science of precursor transformation into PM_{10} ambient concentrations and the need to harmonize the regulation of PM_{10} precursors with other provisions of the CAA:

> The Committee notes that some of these precursors may well be controlled under other provisions of the CAA. The Committee intends that * * * the Administrator will develop models, mechanisms, and other methodology to assess the significance of the PM_{10} precursors in improving air quality and reducing PM_{10}. Additionally, the Administrator should consider the impact on ozone levels of PM_{10} precursor controls. The Committee expects the Administrator to harmonize the PM_{10} reduction objective of this section with other applicable regulations of this CAA regarding PM_{10} precursors, such as NO_X. See H. Rpt. 101–490, Pt. 1, at 268 (May 17, 1990), reprinted in S. Prt. 103–38, Vol. II, at 3292.

In summary, section 302(g) of the CAA clearly calls for the regulation of precursor pollutants, but the CAA also identifies circumstances when it may not be appropriate to regulate precursors and gives the Administrator discretion to determine how to address particular precursors under various programs required by the CAA. Due to the complexities associated with precursor emissions and their variability from location to location, we believe that in certain situations it may not be effective or appropriate to control a certain precursor under a particular regulatory program or for EPA to require similar control of a particular precursor in all areas of the country.

b. Final Rule

The final rule maintains the same legal basis for regulating precursors as was described in the proposal and in the background section above. We also include a clarification of the term ''significant contributor.''

In the proposal, when considering the impacts of the precursors NO_X, VOC and ammonia on ambient concentrations of particulate matter, we referred to the possibility of reversing the presumed approach for regulating or not regulating a precursor if it can be shown that the precursor in question is or is not a ''significant contributor'' to $PM_{2.5}$ concentrations within the specific nonattainment area. ''Significant contribution'' in this context is a different concept than that in Section 110(a)(2)(D). Section 110(a)(2)(D) prohibits States from emitting air pollutants in amounts which significantly contribute to nonattainment or other air quality problems in other states. Consistent with the discussion of sections 189(e) and 302(g) above, we are clarifying that the use in this implementation rule of the term ''significant contribution'' to the nonattainment area's $PM_{2.5}$ concentration means that a significant change in emissions of the precursor from sources in the state would be projected to provide a significant change in $PM_{2.5}$ concentrations in the nonattainment area. For example, if modeling indicates that a reduction in a state's NO_X emissions would reduce ambient $PM_{2.5}$ levels in the nonattainment area, but that a reduction in ammonia emissions would result in virtually no change in ambient $PM_{2.5}$ levels, this would suggest that NO_X is a significant contributor but that ammonia is not. The EPA in this rule is not establishing a quantitative test for determining whether $PM_{2.5}$ levels in a nonattainment area change significantly in response to reductions in precursor emissions in a state. However, in considering this question, it is relevant to consider that relatively small reductions in $PM_{2.5}$ levels are estimated to result in worthwhile public health benefits.

This approach to identifying a precursor for regulation reflects atmospheric chemistry conditions in the area and the magnitude of emissions of the precursor in the area or State. Assessments of which source categories are more cost effective or technically feasible to control should be part of the later RACT and RACM assessment, to

occur after the basic assessment of which precursors are to be regulated is completed.

In the proposed regulatory text, the provisions for reversing presumptions for NO_X, VOC and ammonia included consideration of whether the precursor would significantly contribute to ''other downwind air quality concerns.'' In the final rule we have removed that language to clarify that identification of attainment plan precursors involves evaluation of the impact on $PM_{2.5}$ levels in a nonattainment area of precursor emissions from sources within the state(s) where the nonattainment area is located. Other parts of the Act, notably section 110(a)(2)(D) and section 126, focus on interstate transport of pollutants.

c. Comments and Responses

Comment: The EPA received several comments supporting EPA's interpretation of 302(g) to determine the appropriate regulatory status of each precursor pollutant.

Response: The EPA agrees with the commenters. In establishing section 302(g), Congress intended that precursors to NAAQS pollutants be subject to the air quality planning and control requirements of the CAA. However, the CAA also recognizes that there may be circumstances where it is not appropriate to subject precursors to certain requirements of the CAA.

Comment: The EPA received several comments regarding the applicability of section 189(e), noting that it requires states to presumptively control sources of PM_{10} precursors except where the EPA ''determines that such sources [of precursors] do not significantly contribute to PM_{10} levels which exceed the standard in the area.'' Several commenters stated that EPA does not have the legal authority to regulate $PM_{2.5}$ precursors in a different manner. Several commenters maintained that all $PM_{2.5}$ precursors presumptively should be subject to regulation unless demonstrated by the State as not a significant contributor to $PM_{2.5}$ concentrations in a specific area.

Response: As stated above, EPA believes that section 302(g) allows the Administrator to presumptively not require certain precursors to be addressed in $PM_{2.5}$ implementation plans generally, while allowing the State or EPA to make a finding for a specific area to override the general presumption. In the following pollutant-specific sections of this preamble, EPA finds that at this time there is sufficient uncertainty regarding whether certain precursors significantly contribute to $PM_{2.5}$ concentrations in all nonattainment areas such that the policy set forth in this rule does not presumptively require certain precursors (ammonia, VOC) to be controlled in each area. However, the State or EPA may reverse the presumption and regulate a precursor if it provides a demonstration showing that the precursor is a significant contributor to $PM_{2.5}$ concentrations in the area. In addition, if in the State's SIP planning and adoption process a commenter provides additional information suggesting an alternative policy for regulating a particular precursor, the State will need to respond to this information in its rulemaking action.

3. Policy for Ammonia

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

Ammonia (NH_3) is a gaseous pollutant that is emitted by natural and anthropogenic sources. Emissions inventories for ammonia are considered to be among the most uncertain of any species related to PM. Ammonia serves an important role in neutralizing acids in clouds, precipitation and particles. In particular, ammonia neutralizes sulfuric acid and nitric acid, the two key contributors to acid deposition (acid rain). Deposited ammonia also can contribute to problems of eutrophication in water bodies, and deposition of ammonium particles may effectively result in acidification of soil as ammonia is taken up by plants. The NARSTO Fine Particle Assessment [11] indicates that reducing ammonia emissions where sulfate concentrations are high may reduce $PM_{2.5}$ mass concentrations, but may also increase the acidity of particles and precipitation. An increase in particle acidity is suspected to be linked with human health effects and with an increase in the formation of secondary organic compounds. Based on the above information and further insights gained from the NARSTO Fine Particle Assessment, it is apparent that the formation of particles related to ammonia emissions is a complex, nonlinear process.

Though recent studies have improved our understanding of the role of ammonia in aerosol formation, ongoing research is required to better describe the relationships between ammonia emissions, particulate matter concentrations, and related impacts. The control techniques for ammonia and the analytical tools to quantify the impacts of reducing ammonia emissions on atmospheric aerosol formation are both evolving. Also, area-specific data are needed to evaluate the effectiveness of reducing ammonia emissions on reducing $PM_{2.5}$ concentrations in different areas, and to determine where ammonia decreases may increase the acidity of particles and precipitation.

The proposal showed consideration for the uncertainties about ammonia emissions inventories and about the potential efficacy of ammonia control measures by providing for a case-by-case approach. It was recommended that each State should evaluate whether reducing ammonia emissions would lead to $PM_{2.5}$ reductions in their specific $PM_{2.5}$ nonattainment areas. The proposed policy did not require States to address ammonia as a $PM_{2.5}$ attainment plan precursor, unless a technical demonstration by the State or EPA showed that ammonia emissions from sources in the State significantly contribute to $PM_{2.5}$ concentrations in a given nonattainment area or to other downwind air quality concerns. Where the State or EPA has determined that ammonia is a significant contributor to $PM_{2.5}$ formation in a nonattainment area, the State would be required to evaluate control measures for ammonia emissions in its nonattainment SIP due in 2008, in the implementation of the PM program, and in other associated programs in that area.

b. Final Rule

In the final rule, ammonia is presumed not to be a $PM_{2.5}$ attainment plan precursor, meaning that the State is not required to address ammonia in its attainment plan or evaluate sources of ammonia emissions for reduction measures. This presumption can be reversed based on an acceptable technical demonstration for a particular area by the State or EPA. If a technical demonstration by the State or EPA shows that ammonia emissions from sources in the State significantly contribute to $PM_{2.5}$ concentrations in a given nonattainment area, the State must then evaluate and consider control strategies for reducing ammonia emissions in its nonattainment SIP due in 2008, in the implementation of the $PM_{2.5}$ program. Technical demonstrations on ammonia should also consider the potential for atmospheric and particle acidity to increase with ammonia reductions. Further discussion about technical demonstrations to

[11] NARSTO (2004) (*Particulate Matter Assessment for Policy Makers:* A NARSTO Assessment. P. McMurry, M. Shepherd, and J. Vickery, eds. Cambridge University Press, Cambridge, England. ISBN 0 52 184287 5.

support reversing a $PM_{2.5}$ precursor presumption is included in section II.A.8 below.

This approach was retained from the proposal because of continued uncertainties regarding ammonia emission inventories and the effects of ammonia emission reductions. Ammonia emission inventories are presently very uncertain in most areas, complicating the task of assessing potential impacts of ammonia emissions reductions. In addition, data necessary to understand the atmospheric composition and balance of ammonia and nitric acid in an area are not widely available across $PM_{2.5}$ nonattainment areas, making it difficult to predict the results of potential ammonia emission reductions. Ammonia reductions may be effective and appropriate for reducing $PM_{2.5}$ concentrations in selected locations, but in other locations such reductions may lead to minimal reductions in $PM_{2.5}$ concentrations and increased atmospheric acidity. Research projects continue to expand our collective understanding of these issues, but at this time EPA believes this case-by-case policy approach is appropriate. In light of these uncertainties, we encourage States to continue efforts to better understand the role of ammonia in its fine particle problem areas.

c. Comments and Responses

Comment: One commenter stated that scientific understanding of the complexities of PM formation from ammonia is limited. The commenter claimed that the reduction of ammonia will not reduce PM in many areas, and speciated PM data to investigate the potential decrease in PM from ammonia emissions reductions is not available in all areas.

Response: The final rule takes these uncertainties into consideration by allowing ammonia to be addressed on a case-by-case basis. For any area about which enough information is available to determine that ammonia emission reductions would lead to a beneficial reduction in $PM_{2.5}$, the State can develop a technical demonstration justifying the control of ammonia. If the State chooses to develop such a demonstration, preferably it should be completed as part of the SIP development process and prior to the adoption of control measures, in consultation with the appropriate EPA regional office.

Comment: Some commenters claimed that requiring no action on some precursors is counter to the requirement in sections 172(a)(2) and 188 to attain the NAAQS as expeditiously as practicable. They also asserted that presuming that ammonia is not a $PM_{2.5}$ attainment plan precursor violates 302(g) by improperly delegating authority to the States.

Response: In many areas, reducing ammonia emissions could have little effect on $PM_{2.5}$ concentrations and could lead to the potentially harmful effect of increased atmospheric acidity. While States are not required to take action on ammonia sources under this policy, States would be required to address information on ammonia brought to their attention during the planning and rule adoption process. Under this approach, States should assess whether ammonia reductions would lead to reduced $PM_{2.5}$ concentrations in specific nonattainment areas. If the State decides that ammonia reductions could yield beneficial reductions in $PM_{2.5}$, the State should complete a technical demonstration supporting a reversal of the presumption. The EPA does not believe that this approach improperly delegates authority to the States. It establishes a general presumption for all areas through this rulemaking process, and allows for the presumption to be modified by the State or EPA on a case-by-case basis. EPA still retains the ability to make a technical demonstration for any area if appropriate to reverse the presumption and require ammonia to be addressed in its attainment plan.

Comment: Some commenters stated that the results of a large study on air emissions from concentrated animal feeding operations (CAFOs) should be evaluated before requiring control of ammonia in areas where agriculture is alleged to be a major source.

Response: The $15 million national CAFO consent agreement study coordinated by Purdue University will greatly improve ammonia and VOC emissions inventories and our understanding of the impacts of agricultural emissions on particle formation. The EPA recognizes that the agricultural emissions study is expected to provide data for future planning purposes, and we expect that some of the results of the study will not be available in time to be considered in the development of $PM_{2.5}$ State Implementation Plans dues in April 2008. However, if a State believes it has sufficient technical information to warrant regulation of ammonia emissions in their 2008 implementation plans, it may include in its plan a demonstration to reverse the presumption as well as emission reduction measures. The EPA will review each submittal on a case-by-case basis.

Comment: A presumption to not address ammonia will impede certain states (*i.e.* those that have provisions requiring their regulations to be ''no stricter than Federal'' provisions) from regulating ammonia.

Response: This presumptive approach to ammonia will not restrict States from addressing ammonia in their $PM_{2.5}$ attainment plans. If a State has information indicating that reductions in ammonia emissions would cause beneficial reductions in $PM_{2.5}$ concentrations, the State can make a technical demonstration to reverse the presumption. In such cases, inclusion of ammonia as a $PM_{2.5}$ attainment plan precursor would not be considered stricter than Federal requirements. Under the policy in the final rule, the Federal government or the State may assess the impact of ammonia in a particular area and determine whether the presumption of insignificance is appropriate or whether ammonia is in fact a significant contributor to the $PM_{2.5}$ problem in the area.

4. Policy for VOC

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

The VOC policy in this rule addresses volatile and semivolatile organic compounds, generally up to 24 carbon atoms. High molecular weight organic compounds (typically 25 carbon atoms or more) are emitted directly as primary organic particles and exist primarily in the condensed phase at ambient temperatures. Accordingly, high molecular weight organic compounds are to be regulated as primary $PM_{2.5}$ emissions for the purposes of the $PM_{2.5}$ implementation program.

The organic component of ambient particles is a complex mixture of hundreds or even thousands of organic compounds. These organic compounds are either emitted directly from sources (i.e. primary organic aerosol) or can be formed by reactions in the ambient air (i.e. secondary organic aerosol, or SOA). Volatile organic compounds are key precursors in the formation processes for both SOA and ozone. The relative importance of organic compounds in the formation of secondary organic particles varies from area to area, depending upon local emissions sources, atmospheric chemistry, and season of the year.

The lightest organic molecules (i.e., molecules with six or fewer carbon atoms) occur in the atmosphere mainly as vapors and typically do not directly

form organic particles at ambient temperatures due to the high vapor pressure of their products. However, they participate in atmospheric chemistry processes resulting in the formation of ozone and certain free radical compounds (such as the hydroxyl radical [OH]) which in turn participate in oxidation reactions to form secondary organic aerosols, sulfates, and nitrates. These VOCs include all alkanes with up to six carbon atoms (from methane to hexane isomers), all alkenes with up to six carbon atoms (from ethene to hexene isomers), benzene and many low-molecular weight carbonyls, chlorinated compounds, and oxygenated solvents.

Intermediate weight organic molecules (i.e., compounds with 7 to 24 carbon atoms) often exhibit a range of volatilities and can exist in both the gas and aerosol phase at ambient conditions. For this reason they are also referred to as semivolatile compounds. Semivolatile compounds react in the atmosphere to form secondary organic aerosols. These chemical reactions are accelerated in warmer temperatures, and studies show that SOA typically comprises a higher percentage of carbonaceous PM in the summer as opposed to the winter. The production of SOA from the atmospheric oxidation of a specific VOC depends on four factors: Its atmospheric abundance, its chemical reactivity, the availability of oxidants (O_3, OH, HNO_3), and the volatility of its products. In addition, recent work suggests that the presence of acidic aerosols may lead to an increased rate of SOA formation. Aromatic compounds such as toluene, xylene, and trimethyl benzene are considered to be the most significant anthropogenic SOA precursors and have been estimated to be responsible for 50 to 70 percent of total SOA in some airsheds. Man-made sources of aromatics gases include mobile sources, petrochemical manufacturing and solvents. Some of the biogenic hydrocarbons emitted by trees are also considered to be important precursors of secondary organic particulate matter. Terpenes (and b-pinene, limonene, carene, etc.) and the sesquiterpenes are expected to be major contributors to SOA in areas with significant vegetation cover, but isoprene is not. Terpenes are very prevalent in areas with pine forests, especially in the southeastern U.S. The rest of the anthropogenic hydrocarbons (higher alkanes, paraffins, etc.) have been estimated to contribute 5–20 percent to the SOA concentration depending on the area.

The contribution of the primary and secondary components of organic aerosol to the measured organic aerosol concentrations remains a complex issue. Most of the research performed to date has been done in southern California, and more recently in central California, while fewer studies have been completed on other parts of North America. Many studies suggest that the primary and secondary contributions to total organic aerosol concentrations are highly variable, even on short time scales. Studies of pollution episodes indicate that the contribution of SOA to the organic particulate matter can vary from 20 percent to 80 percent during the same day.

Despite significant advances in understanding the origins and properties of SOA, it remains probably the least understood component of $PM_{2.5}$. The reactions forming secondary organics are complex, and the number of intermediate and final compounds formed is voluminous. Some of the best efforts to unravel the chemical composition of ambient organic aerosol matter have been able to quantify the concentrations of hundreds of organic compounds representing only 10–20 percent of the total organic aerosol mass. For this reason, SOA continues to be a significant topic of research and investigation.

Current scientific and technical information clearly shows that carbonaceous material is a significant fraction of total $PM_{2.5}$ mass in most areas, that certain VOC emissions are precursors to the formation of secondary organic aerosol, and that a considerable fraction of the total carbonaceous material is likely from local as opposed to regional sources. However, while significant progress has been made in understanding the role of gaseous organic material in the formation of organic PM, this relationship remains complex. We recognize that further research and technical tools are needed to better characterize emissions inventories for specific VOC compounds, and to determine the extent of the contribution of specific VOC compounds to organic PM mass.

In light of these factors, the proposed rule did not require States to address VOCs as $PM_{2.5}$ attainment plan precursors and evaluate them for control measures, unless the State or EPA makes a finding that VOCs significantly contribute to a $PM_{2.5}$ nonattainment problem in the State or to other downwind air quality concerns. Many $PM_{2.5}$ nonattainment areas are also nonattainment areas for the 8-hour ozone standard; control measures for VOCs will be implemented in some of these areas, potentially providing a co-benefit for $PM_{2.5}$ concentrations.

b. Final Rule

The final rule maintains the same policy as proposed.[12] States are not required to address VOC in $PM_{2.5}$ implementation plans and evaluate control measures for such pollutants unless the State or EPA makes a technical demonstration that emissions of VOCs from sources in the State significantly contribute to $PM_{2.5}$ concentrations in a given nonattainment area. Technical demonstrations are discussed in section II.A.8 below. If a State chooses to make a technical demonstration, it should be developed in advance of the attainment demonstration.

c. Comments and Responses

Comment: One commenter stated that our understanding of the complexities of $PM_{2.5}$ formation from VOCs is limited, that speciated PM data are not available in all areas, and that VOC reductions will not reduce $PM_{2.5}$ in many areas.

Response: The EPA acknowledges the uncertainties regarding the role of VOC in secondary organic aerosol formation. For this reason the final rule does not presumptively include VOC as a regulated pollutant for PM planning. However, if available data demonstrates that control of VOC would reduce $PM_{2.5}$ concentrations in an area, the State or EPA may include VOC as an attainment plan precursor.

Comment: One commenter stated that the rationale that VOC should not be considered a $PM_{2.5}$ attainment plan precursor because most PM areas are also ozone areas is not appropriate because many ozone areas will attain soon and VOC reductions will still be needed for PM.

Response: The primary rationale for not including VOC as a $PM_{2.5}$ attainment plan precursor in every nonattainment area is the uncertainty regarding the contribution of anthropogenic VOCs to the formation of the organic carbon portion of fine particles. In certain areas, EPA expects that VOC control measures will have some co-benefits in the reduction of fine particulates. However, this reason should not be considered the principal reason for the policy in the final rule that VOCs presumptively should not be considered $PM_{2.5}$ attainment plan precursors. If a State or EPA determines that VOCs do contribute significantly to $PM_{2.5}$ concentrations in an area, the State will be required to evaluate control measures for VOC as a $PM_{2.5}$ attainment plan

[12] The policy is the same as proposed, with the clarification regarding downwind areas discussed above (Section A.2.b).

precursor for that area. This approach will provide for regulation of VOCs in locations where it is most appropriate.

Comment: One commenter suggested that EPA wait for the results of the pending agricultural emissions study before requiring control of VOCs in agricultural areas.

Response: The $15 million national CAFO consent agreement study coordinated by Purdue University will greatly improve ammonia and VOC emissions inventories and our understanding of the impacts of agricultural emissions on particle formation. The EPA recognizes that the agricultural emissions study is expected to provide data for future planning purposes, and we expect that some of the results of the study will not be available in time to be considered in the development of $PM_{2.5}$ State Implementation Plans dues in April 2008. However, if a State believes it has sufficient technical information to warrant regulation of VOC emissions in their 2008 implementation plans, it may include in its plan a demonstration to reverse the presumption as well as emission reduction measures. The EPA will review each submittal on a case-by-case basis.

5. Policy for NO_X

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

The sources of NO_X are numerous and widespread. The combustion of fossil fuel in boilers for commercial and industrial power generation and in mobile source engines each account for approximately 30 percent of NO_X emissions in $PM_{2.5}$ nonattainment areas (based on 2001 emission inventory information). Nitrates are formed from the oxidation of oxides of nitrogen into nitric acid either during the daytime (reaction with OH) or during the night (reactions with ozone and water). Nitric acid continuously transfers between the gas and the condensed phases through condensation and evaporation processes in the atmosphere. However, unless it reacts with other species (such as ammonia, sea salt, or dust) to form a neutralized salt, it will volatilize and not be measured using standard $PM_{2.5}$ measurement techniques. The formation of aerosol ammonium nitrate is favored by the availability of ammonia, low temperatures, and high relative humidity. Because ammonium nitrate is semivolatile and not stable in higher temperatures, nitrate levels are typically lower in the summer months and higher in the winter months. The resulting ammonium nitrate is usually in the sub-micrometer particle size range. Reactions with sea salt and dust lead to the formation of nitrates in coarse particles. Nitric acid may be dissolved in ambient aerosol particles.

Based on a review of speciated monitoring data analyses, it is apparent that nitrate concentrations vary significantly across the country. For example, in some southeastern locations, annual average nitrate levels are in the range of 6 to 8 percent of total $PM_{2.5}$ mass, whereas nitrate comprises 40 percent or more of $PM_{2.5}$ mass in certain California locations. Nitrate formation is favored by the availability of ammonia, low temperatures, and high relative humidity. It is also dependent upon the relative degree of nearby SO_2 emissions because ammonia reacts preferentially with SO_2 over NO_X. NO_X reductions are expected to reduce $PM_{2.5}$ concentrations in most areas. However, it has been suggested that in a limited number of areas, NO_X control would result in increased $PM_{2.5}$ mass by disrupting the ozone cycle and leading to increased oxidation of SO_2 to form sulfate particles, which are heavier than nitrate particles. Because of the above factors, the proposed rule presumed that States must evaluate and implement reasonable controls on sources of NO_X in all nonattainment areas, but allowed for the State and EPA to develop a technical demonstration to reverse this presumption.

b. Final Rule

The EPA is retaining the proposed approach in the final rule.[13] Under this policy, States are required to address NO_X as a $PM_{2.5}$ attainment plan precursor and evaluate reasonable controls for NO_X in $PM_{2.5}$ attainment plans, unless the State and EPA make a finding that NO_X emissions from sources in the State do not significantly contribute to $PM_{2.5}$ concentrations in the relevant nonattainment area. This presumptive policy is consistent with other recent EPA regulations requiring NO_X reductions which will reduce fine particle pollution, such as the Clean Air Interstate Rule and a number of rules targeting onroad and nonroad engine emissions.

Technical demonstrations that would reverse the presumption should be developed in advance of the attainment demonstration and are discussed in section II.A.8 below.

[13] The policy is the same as proposed, with the clarification regarding downwind areas discussed above (Section A.2.b).

c. Comments and Responses

Comment: Most commenters generally agreed with the proposed inclusion of NO_X as a presumptive $PM_{2.5}$ attainment plan precursor.

Response: The EPA agrees with these commenters.

Comment: Some commenters requested guidance on what would constitute an acceptable demonstration to reverse the presumption that NO_X is a $PM_{2.5}$ attainment plan precursor.

Response: Guidance on technical demonstrations to reverse the presumptive inclusion of NO_X in all state implementation plans is discussed in section II.A.8 below.

Comment: One commenter raised concerns that the proposed policy for NO_X would allow a State to find NO_X to be an insignificant contributor to an area's $PM_{2.5}$ nonattainment problem and effectively keep the State from controlling the area's NO_X emissions for other purposes, such as to address interstate transport under section 110 of the CAA. Section 110 requires SIPs to prohibit emissions within the State that would contribute significantly to another State's nonattainment problem or interfere with another State's maintenance plan.

Response: The identification of precursors for regulation under this rule is for purposes of $PM_{2.5}$ nonattainment and maintenance plans under Part D of the CAA. The $PM_{2.5}$ implementation rule does not prevent a State from regulating NO_X sources under any other Federal or State rule, including interstate transport rules under Section 110.

6. Policy for SO_2

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

Sulfur dioxide is emitted mostly from the combustion of fossil fuels in boilers operated by electric utilities and other industry. Less than 20 percent of SO_2 emissions nationwide are from other sources, mainly other industrial processes such as oil refining and pulp and paper production. The formation of sulfuric acid from the oxidation of SO_2 is an important process affecting most areas in North America. There are three different pathways for this transformation.

First, gaseous SO_2 can be oxidized by the hydroxyl radical (OH) to create sulfuric acid. This gaseous SO_2 oxidation reaction occurs slowly and only in the daytime. Second, SO_2 can

dissolve in cloud water (or fog or rain water), and there it can be oxidized to sulfuric acid by a variety of oxidants, or through catalysis by transition metals such as manganese or iron. If ammonia is present and taken up by the water droplet, then ammonium sulfate will form as a precipitate in the water droplet. After the cloud changes and the droplet evaporates, the sulfuric acid or ammonium sulfate remains in the atmosphere as a particle. This aqueous phase production process involving oxidants can be very fast; in some cases all the available SO_2 can be oxidized in less than an hour. Third, SO_2 can be oxidized in reactions in the particle-bound water in the aerosol particles themselves. This process takes place continuously, but only produces appreciable sulfate in alkaline (dust, sea salt) coarse particles. Oxidation of SO_2 has also been observed on the surfaces of black carbon and metal oxide particles. During the last 20 years, much progress has been made in understanding the first two major pathways, but some important questions still remain about the smaller third pathway. Models indicate that more than half of the sulfuric acid in the eastern United States and in the overall atmosphere is produced in clouds.

The sulfuric acid formed from the above pathways reacts readily with ammonia to form ammonium sulfate, $(NH_4)_2SO_4$. If there is not enough ammonia present to fully neutralize the produced sulfuric acid (one molecule of sulfuric acid requires two molecules of ammonia), part of it exists as ammonium bisulfate, NH_4HSO_4 (one molecule of sulfuric acid and one molecule of ammonia) and the particles are more acidic than ammonium sulfate. In certain situations (in the absence of sufficient ammonia for neutralization), sulfate can exist in particles as sulfuric acid, H_2SO_4. Sulfuric acid often exists in the plumes of stacks where SO_2, SO_3, and water vapor are in much higher concentrations than in the ambient atmosphere, but these concentrations become quite small as the plume is cooled and diluted by mixing.

Because sulfate is a significant contributor (e.g. ranging from 9 percent to 40 percent) to $PM_{2.5}$ concentrations in nonattainment areas and to other air quality problems in all regions of the country, EPA proposed that States would be required to address sulfur dioxide as a $PM_{2.5}$ attainment plan precursor in all areas.

b. Final Rule

The final rule includes the same policy for sulfur dioxide as in the proposal. States are required to address sulfur dioxide as a $PM_{2.5}$ attainment plan precursor and evaluate SO_2 for possible control measures in all areas. Sulfate is an important precursor to $PM_{2.5}$ formation in all areas, and has a strong regional impact on $PM_{2.5}$ concentrations. This policy is consistent with past EPA regulations, such as the CAIR, the Clean Air Visibility Rule, the Acid Rain rules, and the Regional Haze rule, that require SO_2 reductions to address fine particle pollution and related air quality problems.

Under the transportation conformity program, sulfur dioxide is not required to be addressed in transportation conformity determinations *before* a SIP is submitted unless either the state air agency or EPA regional office makes a finding that on-road emissions of sulfur dioxide are significant contributors to the area's $PM_{2.5}$ problem. Sulfur dioxide would be addressed *after* a $PM_{2.5}$ SIP is submitted if the area's SIP contains an adequate or approved motor vehicle emissions budget for sulfur dioxide. EPA based this decision on the *de minimis* level of sulfur dioxide emissions from on-road vehicles currently, and took into consideration the fact that sulfur dioxide emissions from on-road sources will decline in the future due to the implementation of requirements for low sulfur gasoline (which began in 2004) and for low sulfur diesel fuel (beginning in 2006). For more information, see the May 6, 2005 transportation conformity rule on $PM_{2.5}$ precursors at 70 FR 24283.

c. Comments and Responses

Comment: Most commenters agreed with the proposed policy for SO_2. One commenter stated, ''* * * requiring states to address sulfur dioxide in attainment planning in all areas is consistent with the science of $PM_{2.5}$ formation and essential to effective implementation of the $PM_{2.5}$ NAAQS.'' Another commenter concluded that EPA's proposal ''* * * is justified based on the fact that SO_2 has been found to be a significant contributor to $PM_{2.5}$ nonattainment in all areas.''

Response: The EPA agrees with these comments.

Comment: Some commenters believe States should be able to make a demonstration that SO_2 not be addressed as an attainment plan precursor. The commenters claim that the urban increment of sulfate is generally small, and SO_2 control will not matter in many areas. Commenters also note that a large percentage of the SO_2 emission inventory is being reduced and will be reduced further through existing programs, and that if attainment can be demonstrated without additional SO_2 controls, a State should be allowed to make that demonstration in its SIP. One commenter stated that whether SO_2 emissions from a given source located in a nonattainment area in fact contribute significantly to ambient concentrations of sulfate and $PM_{2.5}$ in that nonattainment area likely will depend on a range of factors, including source type, stack height, location, and meteorology. The commenter asserted that sulfate forms over significant geographic distances from the source of the SO_2 emissions and may not form significant concentrations of $PM_{2.5}$ in the local nonattainment area.

Response: As in the proposal, the final rule requires SO_2 to be considered a $PM_{2.5}$ attainment plan precursor in all cases. Sulfate is a significant fraction of $PM_{2.5}$ mass in all nonattainment areas currently, and although large SO_2 reductions are projected from electric generating units with the implementation of the CAIR program, sulfate is still projected to be a key contributor to $PM_{2.5}$ concentrations in the future. SO_2 emissions also lead to sulfate formation on both regional and local scales. The EPA agrees that the extent of the contribution from a particular source in a nonattainment area to $PM_{2.5}$ concentrations in the area will depend on a number of factors, and that at times the reaction of SO_2 emissions in the atmosphere to form sulfate particles may occur less rapidly and extend over a significant distance. However, at other times the conversion of SO_2 to sulfate can occur rapidly and local impacts from a particular source can be more significant. States are required to develop plans to attain as expeditiously as practicable through the identification of technically and economically feasible control measures from the full range of source categories contributing to $PM_{2.5}$ nonattainment areas. In developing these plans, each State will need to consider whether controls on local SO_2 sources would be cost-effective and would be needed to attain expeditiously.

7. Policy for Direct PM

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

This section addresses inorganic and organic forms of directly emitted PM. Although these direct emissions are by definition not precursors to $PM_{2.5}$, this section is included to provide information on the full range of

components that commonly make up fine particulate matter.

The main anthropogenic sources of inorganic (or crustal) particles are: entrainment by vehicular traffic on unpaved or paved roads; mechanical disturbance of soil by highway, commercial, and residential construction; and agricultural field operations (tilling, planting and harvesting). Industrial processes such as quarries, minerals processing, and agricultural crop processing can also emit crustal materials. While much of these emissions are coarse PM, the size distribution can have a tail of particles smaller than $PM_{2.5}$.

In general, coarse PM is most important close to the source, and not generally a significant contributor to regional scale PM problems. Even so, during certain high wind events, fine crustal PM has been shown to be transported over very long distances.

Emission estimates of mechanically suspended crustal PM from sources within the U.S. are often quite high. However, this PM is often released very close to the ground, and with the exception of windblown dust events, thermal or turbulent forces sufficient to lift and transport these particles very far from their source are not usually present. Thus, crustal material is only a minor part of $PM_{2.5}$ annual average concentrations.

Primary carbonaceous particles are largely the result of incomplete combustion of fossil or biomass fuels. This incomplete combustion usually results in emissions of both black carbon and organic carbon particles. High molecular weight organic molecules (i.e., molecules with 25 or more carbon atoms) are either emitted as solid or liquid particles, or as gases that rapidly condense into particle form. These heavy organic molecules sometimes are referred to as volatile organic compounds, but because their characteristics are most like direct PM emissions, they will be considered to be primary emissions for the purposes of this regulation. Primary organic carbon also can be formed by condensation of semi-volatile compounds on the surface of other particles.

The main combustion sources emitting carbonaceous $PM_{2.5}$ are certain industrial processes, managed burning, wildland fires, open burning of waste, residential wood combustion, coal and oil-burning boilers (utility, commercial and industrial), and mobile sources (both onroad and nonroad). Certain organic particles also come from natural sources such as decomposition or crushing of plant detritus. Most combustion processes emit more organic particles than black carbon particles. A notable exception to this is diesel engines, which typically emit more black carbon particles than organic carbon. Because photochemistry is typically reduced in the cooler winter months for much of the country, studies indicate that the carbon fraction of PM mass in the winter months is likely dominated by direct PM emissions as opposed to secondarily formed organic aerosol.

Particles from the earth's crust may contain a combination of metallic oxides and biogenic organic matter. The combustion of surface debris will likely entrain some soil. Additionally, emissions from many processes and from the combustion of fossil fuels contain elements that are chemically similar to soil. Thus, a portion of the emissions from combustion activities may be classified as crustal in a compositional analysis of ambient $PM_{2.5}$. The proposed rule required that States address the direct emissions of particulate matter in their $PM_{2.5}$ attainment plans. During the comment period, EPA received several comments regarding the definition of what should be regulated as ''direct $PM_{2.5}$.''

b. Final Rule

This rule defines direct $PM_{2.5}$ emissions as ''air pollutant emissions of direct fine particulate matter, including organic carbon, elemental carbon, direct sulfate, direct nitrate, and miscellaneous inorganic material (i.e. crustal material).'' Development of attainment plans will include direct $PM_{2.5}$ emissions and specific $PM_{2.5}$ attainment plan precursors.

c. Comments and Responses

Comment: A few commenters noted that 40 CFR 51.1000 of the proposed rule includes definitions for both ''direct $PM_{2.5}$ emissions'' and for ''$PM_{2.5}$ direct emissions.'' They recommend including just one definition in the final rule.

Response: The EPA acknowledges this oversight and has included in the final rule a single definition for ''direct $PM_{2.5}$ emissions.'' It reads: ''Direct $PM_{2.5}$ emissions means solid particles emitted directly from an air emissions source or activity, or gaseous emissions or liquid droplets from an air emissions source or activity which condense to form particulate matter at ambient temperatures. Direct $PM_{2.5}$ emissions include elemental carbon, directly emitted organic carbon, directly emitted sulfate, directly emitted nitrate, and other inorganic particles (including but not limited to crustal material, metals, and sea salt).''

8. Optional Technical Demonstrations for NO_X, VOC, and Ammonia

[Section II.E.2 of November 1, 2005 proposed rule (70 FR 65999); sec. 51.1002 in draft and final regulatory text.]

a. Background

The proposed rule required States to evaluate and consider control strategies for sources of SO_2 and direct $PM_{2.5}$ emissions in all nonattainment areas. For the precursors NO_X, VOC, and ammonia, the proposed rule included presumptive policies that could be reversed with an acceptable technical demonstration by the State or EPA. (The policy in the proposal presumptively required that NO_X emissions must be addressed in all areas, and that VOC and ammonia emissions do not need to be addressed in all areas.) A number of commenters requested additional guidance on the criteria for an acceptable technical demonstration.

b. Final Rule

The final rule retains provisions for the State or EPA to conduct a technical demonstration to reverse the presumptive inclusion of NO_X or to reverse the presumptive exclusions of ammonia and VOC as $PM_{2.5}$ attainment plan precursors. Demonstrations to reverse the presumptions for ammonia, VOC, or NO_X are to be based on the weight of evidence of available information, and any demonstration by the State must be approved by EPA. The State must demonstrate that based on the sum of available technical and scientific information, it would be appropriate for a nonattainment area to reverse the presumptive approach for a particular precursor. The demonstration should include information from multiple sources, including results of speciation data analyses, air quality modeling studies, chemical tracer studies, emission inventories, or special intensive measurement studies to evaluate specific atmospheric chemistry in an area.

Because of the variation among nonattainment areas in terms of such factors as local emissions sources, growth patterns, topography, and severity of the nonattainment problem, EPA believes that it would not be appropriate to define a prescriptive set of analyses that must be included in all $PM_{2.5}$ precursor technical demonstrations. The key criterion is that any technical demonstration must fairly represent available information.

In developing the implementation plan for a nonattainment area, the State should use all relevant information

available (from EPA, the State, or other sources) to determine the scientifically most appropriate approach to regulating NO_X, ammonia, and VOC emissions in the area. As required under any State rulemaking process, the State must consider and provide a response in the record to any information or evidence brought forward by commenters during the SIP planning, development and review process which indicates that the presumption for a precursor should be reversed. In its review of the forthcoming State implementation plan submittal, EPA will review the State's proposed precursor policies in light of all currently available information. If information brought forward by commenters or the State in the SIP development process shows that the presumption in this rule for ammonia, VOC or NO_X is not technically justified for a particular nonattainment area, the State must conduct a technical demonstration to reverse the presumption. In the case of ammonia or VOC, the State then would evaluate control measures and implement those measures that are technically and economically feasible and that will contribute to expeditious attainment of the standards.

In the section below we suggest examples of the types of analyses that would be appropriate to use in developing such a demonstration. States are encouraged to consult with EPA in formulating appropriate technical demonstrations.

i. *Emission Inventory Information:* An analysis might show that a precursor composes a significant fraction of the emissions inventory in an area and therefore requires greater consideration.

Example: Several stationary sources emitting particular VOCs known to contribute to SOA formation make up a significant portion of the area's VOC inventory. This analysis may be useful in conjunction with other analyses included in a weight of evidence demonstration.

ii. *Speciation Data Information:* Analysis of data from speciation networks might lead a State to determine the relative importance of a precursor to seasonal or yearly average PM concentrations. Individual precursors require different approaches. Collection of new data could be used to understand the impacts of precursors in an area.

Example: Nitrate ion is a large portion of winter average $PM_{2.5}$ mass. Nitrate ion is a major portion of $PM_{2.5}$ mass on the 10 highest $PM_{2.5}$ days in winter in the past 3 years. The days with the highest mass concentrations might be indicative of inversion conditions and/or local impacts, rather than large-scale transport processes. For these reasons, nitrate should be addressed in the $PM_{2.5}$ attainment plan.

Example: Ammonium ion data combined with total calculated nitrate data indicates that reductions in ammonia would reduce PM concentrations without a sharp related increase in particle acidity. PM speciation data shows that PM in the area is generally within 10% of calculated neutralization. In places for which the needed atmospheric data are available to determine whether increased acidity is estimated to lead to negative environmental effects, analysis showing that increased acidity of particles and precipitation would likely result from ammonia reductions would support the presumption against ammonia regulation. Analysis showing that ammonia reductions would be unlikely to increase the acidity of particles and precipitation, and that potential reductions in ammonia would significantly reduce $PM_{2.5}$ levels, would support a technical demonstration to reverse the presumption.

iii. *Modeling Information:* Results of atmospheric modeling may help a State characterize the impacts of potential precursor emission reductions on $PM_{2.5}$ concentrations in an area.

Example: Modeling of SO_2, NO_X, and VOC emission reductions result in lower sulfate and nitrate levels but not lower secondary organic aerosol levels. This likely indicates that VOC reductions are not as vital as reductions of the other precursors.

Example: Modeled reductions of NO_X show a potential increase in sulfate formation through disruption of the ozone cycle. SO_2 reductions may be a better choice than NO_X reductions.

Example: Modeled ammonia reductions show a projected reduction in $PM_{2.5}$ concentrations in selected areas. Although dependant on good quality inventory data, this type of an analysis would indicate that the area is ammonia-limited and that ammonia reductions may be beneficial.

Example: Modeling shows that reductions in SO_2 in the absence of NO_X reductions in an area will not result in a significant $PM_{2.5}$ reduction because more nitrate particles form when less SO_2 is available for particle formation. However, $PM_{2.5}$ reductions are significant when both SO_2 and NO_X are reduced concurrently. This analysis would indicate that NO_X reductions should be included in the $PM_{2.5}$ attainment plan for the area.

iv. *Monitoring, Data Analysis, or Other Special Studies:* Could include monitoring of gases and compounds not typically monitored under the $PM_{2.5}$ speciation network, receptor modeling analysis, or special monitoring studies.

Example: Data from specialized monitoring studies can provide insights about concentrations of ammonia gas and nitric acid in an area and whether the area is ammonia-limited or not. Ammonia reductions in ammonia-limited areas typically yield reductions in $PM_{2.5}$ concentrations. Specialized monitoring and laboratory studies can also assess the relative concentrations of organic compounds and provide insights into the contributions of different anthropogenic and biogenic VOCs to secondary organic aerosol formation.

Example: Receptor modeling and statistical analysis $PM_{2.5}$ speciation monitoring data can indicate relative contributions to $PM_{2.5}$ mass from sources with different chemical ''fingerprints.''

Example: Additional analysis of organic compounds on filters collected through speciation monitoring may reveal insights about the relative degree of carbonaceous material considered to be from fossil fuel combustion as opposed to combustion of ''modern'' material (such as wood or biomass).

c. Comments and Responses

Comment: A number of commenters requested that the final rule include guidance on acceptable technical demonstrations.

Response: The above section includes examples designed to help States formulate appropriate demonstrations. Prescribing specific technical indicators to be used in all areas would ignore the scientific uncertainty inherent in the relationships between precursor emissions and the responses of atmospheric concentrations of $PM_{2.5}$. Therefore, States are encouraged to review available information and consult with EPA in formulating technical demonstrations appropriate to a particular area.

B. No Classification System

1. No Classification System

a. Background

Section 172 of subpart 1 contains the general requirements for SIPs for all nonattainment areas. Section 172(a)(1) states that on or after the date of designation, the Administrator may classify an area for the purpose of applying an attainment date or for some other purpose. Thus, a classification system is allowed under section 172 of the CAA, but is not required for the purposes of implementing a national ambient air quality standard. The CAA also states that EPA may consider certain factors in making a decision concerning classification for areas, such as the severity of nonattainment in such areas, and the availability and feasibility of the pollution control measures that may be needed to achieve attainment. In the proposed rule, EPA provided two implementation approaches for classifying $PM_{2.5}$ nonattainment areas. Under the first approach, there would be no classification system. Under the second approach, a two-tiered classification system would apply, with areas classified as either ''moderate'' or ''serious'' based on specific criteria.

For example, the two classification tiers could be based on the severity of nonattainment (e.g., serious areas would be those with a design value above a specific threshold), or on the attainment date for the area (e.g., serious areas would be those with attainment dates after April 2010). However, any moderate area that needs an attainment date longer than 5 years would be reclassified as serious. This would ensure that areas with a more persistent $PM_{2.5}$ problem are subject to more stringent requirements, even if they are not one of the areas with the highest current design values. For such areas, the State would be required to request reclassification for an area and ensure that the 2008 attainment SIP submission for the area includes all measures needed to meet the serious area requirements. Under the two tiered classification approach, we proposed that serious $PM_{2.5}$ nonattainment areas would be required to meet the more stringent requirements than moderate areas that would be defined in this rulemaking action (e.g., lower thresholds for RACT, fixed percentage reduction for RFP, etc.). For serious areas, the attainment date would be as expeditious as practicable, but no later than 10 years after designation, depending on the year in which the area would be projected to attain considering existing control requirements and the effect of RACM, RACT and RFP.

b. Final Rule

The EPA believes that in the case of $PM_{2.5}$, the no-classification approach is the most appropriate approach. An advantage of this approach is that it provides a relatively simple implementation structure for State implementation of the $PM_{2.5}$ standards, and avoids the need to define a classification system and determine classifications for each area. Without classifications, this rule still requires that that SIPs include all reasonable measures that contribute to achieving attainment as expeditiously as practicable. (Further detail is provided in sections D. and F. below.) Because of differences in the nature and sources of the $PM_{2.5}$ problem in different parts of the country, EPA did not find it appropriate to establish a tiered classification system with increasing control measure requirements. The no-classifications approach provides States with greater flexibility to determine the control strategies that will be most effective and efficient in bringing specific areas into attainment as expeditiously as practicable. In addition, EPA believes that States requesting additional time to attain the standard beyond the initial 5 year attainment date, provided for under Subpart I, will need to adopt additional or more stringent measures to meet their obligations for RACT, RACM and attainment that is as expeditious as practicable. We believe that this addresses the main concerns of those commenters who contend that a two tiered classification system should be implemented.

c. Comments and Responses

Comment: The majority of the commenters who commented on this issue stated that they agreed with EPA's preferred no classification approach. These commenters generally stated that they believed that EPA has the authority not to establish a classification system for $PM_{2.5}$ nonattainment areas. Some commenters stated that it would also be unreasonable, at this point in the process, for EPA to implement a classification scheme for the $PM_{2.5}$ standard. Many commenters support the no classification approach because it provides for a simple implementation structure and/or allows greater implementation flexibility to States, including flexibility to address specific problems related to individual nonattainment areas in the most cost-effective and expeditious manner, rather than through a one size fits all approach. Other commenters stated that they believe that a classification system is not needed because nonattainment areas in the Eastern United States are likely to attain the standard within a timeframe that is consistent with the timeframe established under Subpart 1.

Response: The EPA agrees with these commenters.

Comment: Several commenters disagreed with EPA's preferred approach and agreed with the two tiered classification approach featuring a ''moderate'' and a ''serious'' area classification. These commenters also stated that the threat of reclassification or ''bump up'' to a higher classification was a powerful incentive for areas to attain as expeditiously as practicable. Commenters also indicated that areas needing more time to attain the standard should be required to implement more stringent measures or mandatory measures.

Response: The EPA agrees that areas with more severe nonattainment problems will need to implement more stringent measures to attain. However, EPA does not believe that a classification system is needed to ensure that such measures are implemented. The EPA believes that on balance the no classification approach is the most appropriate classification option for the implementation of the $PM_{2.5}$ standard because of the difference in contributing sources from area to area.

Comment: Several commenters stated that under EPA's preferred approach, each State would be required to submit an attainment demonstration proposing an attainment date that is ''as expeditious as practicable'' for each area. They asserted that to allow States to propose their own attainment dates would invite delay in the process of cleaning up fine particle pollution. These commenters further stated that States would have no incentive to set an attainment date earlier than the outer limit set by EPA, even if it would be practicable to attain the NAAQS sooner.

Response: Section 172 of the CAA requires SIPs to demonstrate attainment as expeditiously as practicable regardless of whether there is a classification system, and under this rule states must justify that their attainment date is as expeditious as practicable considering all reasonable measures. As noted above, EPA believes that States requesting additional time to attain the standard beyond the initial 5 year attainment date will need to adopt additional or more stringent measures to meet their obligations for RACT and RACM and to attain as expeditiously as practicable. More details on the analytical process required for an attainment demonstration is included in section II.F.

Comment: Several commenters stated that the CAA requires regulation of the $PM_{2.5}$ standard under Subpart 4 of Part D. These commenters state that EPA takes the position that it must regulate $PM_{2.5}$ under Subpart 1 of the CAA, which applies to nonattainment areas in general. The commenters state that section 7513, in Subpart 4 of Part D of the CAA, contains specific provisions for classification of particulate matter nonattainment areas, and that EPA must therefore regulate $PM_{2.5}$ under Subpart 4, which requires a moderate and serious area classification system. Other commenters argued that implementation of the $PM_{2.5}$ standard must proceed under Subpart 1 of Part D of Title I of the CAA and cannot be governed by Subpart 4 of Part D, which addresses the implementation of the PM_{10} standard which is a different pollutant than $PM_{2.5}$.

Response: The EPA finds that the $PM_{2.5}$ standard should be implemented under subpart I of the CAA, which is the general provision of the CAA related to NAAQS implementation. Part D of Title I of the CAA sets forth the requirements for SIPs needed to attain the national ambient air quality standards. Part D also includes a general provision under

Subpart I which applies to all NAAQS for which a specific subpart does not exist. Because the $PM_{2.5}$ standards were not established until 1997, the plan provisions found in section 172 of subpart 1 pertaining to plans for nonattainment areas apply. The EPA further agrees with comments stating that subpart 4 on its face applies only to the PM_{10} standard. In general, the emphasis in subpart 4 on reducing PM_{10} concentrations from certain sources of direct $PM_{2.5}$ emissions can be somewhat effective in certain $PM_{2.5}$ nonattainment areas but not in all. Contributions to $PM_{2.5}$ concentrations are typically from a complex mix of sources of primary emissions and sources of precursor emissions which form particles through reactions in the atmosphere. $PM_{2.5}$ also differs from PM_{10} in terms of atmospheric dispersion characteristics, chemical composition, and contribution from regional transport.

2. Rural Transport Classification Option

a. Background

The 8-hour ozone implementation program includes a ''rural transport classification'' for subpart 1 nonattainment areas. In the proposal for this rule we discussed whether an area classification of this type would be appropriate for the $PM_{2.5}$ implementation program in light of the fact that no currently designated $PM_{2.5}$ nonattainment area met the criteria similar to those that apply to rural transport areas under the ozone implementation program.

As addressed in the proposal, a $PM_{2.5}$ nonattainment area would qualify for the ''rural transport'' classification if it met criteria similar to those specified for rural transport areas for the 1-hour ozone standard under section 182(h). Section 182(h) defines ''rural transport'' areas as those areas that do not include, and are not adjacent to, any part of a Metropolitan Statistical Area (MSA) or, where one exists, a Consolidated Metropolitan Statistical Area (CMSA). Section 182(h) further limits the category to those areas whose own emissions do not make a significant contribution to pollutant concentrations in those areas, or in other areas.

As discussed in the preamble to the proposed rule, potential criteria for a State to identify an area for a rural transport classification under the $PM_{2.5}$ program could be similar to the criteria used in the ozone implementation program: A State with a $PM_{2.5}$ ''rural transport'' area would need to (1) demonstrate that the area meets the above criteria, (2) demonstrate using EPA approved attainment modeling that the nonattainment problem in the area is due to the ''overwhelming transport'' of emissions from outside the area, and (3) demonstrate that sources of $PM_{2.5}$ and its precursor emissions within the boundaries of the area do not contribute significantly to $PM_{2.5}$ concentrations that are measured in the area or in other areas.

An area which qualifies for the ''rural transport'' classification would only be required to adopt local control measures sufficient to demonstrate that the area would attain the standard by its attainment date ''but for'' the overwhelming transport of emissions emanating from upwind States. RFP requirements under subpart 1 would still apply to these areas. As with other nonattainment areas, rural transport nonattainment areas would be subject to NSR, transportation conformity, and general conformity requirements. In the proposal we solicited comments on whether it would be appropriate to establish less burdensome NSR requirements in the event that a classification for rural transport areas is adopted in the final rule. The EPA requested comment on whether this type of classification option is needed at all under the $PM_{2.5}$ implementation program.

b. Final Rule

The final rule does not include a rural transport classification. This type of classification was included in the CAA for purposes of implementing the ozone standards because of the phenomenon of the formation of high ozone levels far downwind in very rural locations, including on high elevation mountain peaks. In reviewing the currently designated $PM_{2.5}$ nonattainment areas, it appears that all areas but one are within or adjacent to a metropolitan area (*i.e.* core-based statistical area or consolidated statistical area), and thus would not meet the criteria discussed above. Although $PM_{2.5}$ concentrations are greatly affected by long-range transport of air pollution, it appears that nonattainment areas typically are located in urban areas and include significant local pollutant sources.

c. Comments and Responses

Comment: Several commenters stated that they do not support the adoption of a rural transport classification because it is not needed. Commenters stated that given the criteria for the rural transport classification, which greatly limits its applicability, few if any $PM_{2.5}$ nonattainment areas can qualify for the option. One commenter stated that EPA modeled the rural transport classification after the ''rural transport areas'' provision contained in subpart 2 of the CAA, which applies only to the ozone standard. The commenter further states that neither Subpart 1 nor 4 contain any statutory authority for such a classification.

Response: The EPA believes that it has sufficient statutory authority under the CAA to establish a rural transport classification, but we do not believe that such a classification is needed.

Comment: One commenter generally supported the rural transport concept and the proposed associated requirements, with the addition that data analysis be included as appropriate in the required technical demonstrations in addition to modeling. While no $PM_{2.5}$ area currently meets the requirements for the rural transport classification option, several commenters recommended that it be maintained for potential cases in which the $PM_{2.5}$ standards are made more stringent, or measured air quality in areas change in such a way that areas would qualify for the rural transport classification at a later date.

Response: The EPA does not agree that a rural transport classification is needed. The EPA will re-evaluate the need for such a classification as appropriate.

C. Due Dates and Basic Requirements for Attainment Demonstrations

a. Background

Part D of Title I of the CAA sets forth the requirements for SIPs needed to attain the national ambient air quality standards. Part D includes a general subpart 1 which applies to all NAAQS for which a specific subpart does not exist. The 1990 CAA Amendments do not include any subpart for $PM_{2.5}$ because the $PM_{2.5}$ standards were not yet established. The EPA has determined that for $PM_{2.5}$, the nonattainment area plan provisions found in section 172 of subpart 1 apply.

Section 172(b) of the CAA requires that at the time the Agency promulgates nonattainment area designations, the EPA must also establish a schedule for States to submit SIPs meeting the applicable requirements of section 172(c) and of section 110(a)(2) of the CAA. Nonattainment area designations were finalized in December 2004, and a supplemental notice was issued in April 2005. Consistent with section 172(b) of the CAA, 40 CFR 51.1002 of the proposed rule requires the State to submit its attainment demonstration and SIP revision within 3 years, or by April 2008.

Section 51.1006 of the proposed rule addresses the situation in which an area

is initially designated as attainment/unclassifiable but is later designated as nonattainment based on air quality data after the 2001–2003 period. Under such circumstances, the SIP submittal date would be 3 years from the effective date of the redesignation, and the attainment date would be as expeditiously as practicable but no later than 5 years from the effective date of the redesignation.

The section 172(c) requirements that States are to address under section 172(c) (including RACT, RACM, RFP, contingency measures, emission inventory requirements, and NSR) are discussed in later sections of this document. Section 110(a)(2) of the CAA requires all States to develop and maintain a solid air quality management infrastructure, including enforceable emission limitations, an ambient monitoring program, an enforcement program, air quality modeling, and adequate personnel, resources, and legal authority. Section 110(a)(2)(D) also requires State plans to prohibit emissions from within the State which contribute significantly to nonattainment or maintenance areas in any other State, or which interfere with programs under part C to prevent significant deterioration of air quality or to achieve reasonable progress toward the national visibility goal for Federal class I areas (national parks and wilderness areas). In order to assist States in addressing their obligations regarding regionally transported pollution, EPA has finalized the CAIR to reduce SO_2 and nitrogen oxide emissions from large electric generating units.[14]

To date, few states have submitted a SIP revision addressing the section 110(a)(2) requirements for the purposes of implementing the $PM_{2.5}$ standards. The EPA recognizes that this situation is due in part to the fact that there were a series of legal challenges to the PM standards which were not resolved until March 2002, at which time the standards and EPA's decision process were upheld (see section I.B. for further discussion of past legal challenges to the standards). To address the States' continuing obligation to address the requirements of section 110(a), 40 CFR 51.1002 of the proposed rule also required each State to address the required elements of section 110(a)(2) of the CAA as part of the SIP revision adopting its attainment plan, if it has not already done so. On March 10, 2005, EPA entered into a consent decree with Environmental Defense and American Lung Association concerning EPA's failure to find that States failed to submit SIPs to address the section 110(a)(2) requirements. As a part of that consent decree, by no later than October 8, 2008, EPA is required to publish a notice in the **Federal Register** related to its determinations of whether each State has submitted SIPs for $PM_{2.5}$ that meet the requirements as stated under section 110(a)(2) of the CAA.

b. Final Rule

The final rule maintains the regulatory approach described above.

c. Comments and Responses

There were no comments on this portion of the proposal.

D. Attainment Dates

1. Background on Statutory Requirements

Establishing attainment dates. Section 172(a)(2) states that an area's attainment date ''shall be the date by which attainment can be achieved as expeditiously as practicable, but no later than 5 years from the date such area was designated nonattainment * * *, except that the Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period no greater than 10 years from the date of designation as nonattainment considering the severity of nonattainment and the availability and feasibility of pollution control measures.''

Since $PM_{2.5}$ designations have an effective date of April 5, 2005, the initial 5-year attainment date for $PM_{2.5}$ areas would be no later than April 5, 2010. For an area with an attainment date of April 5, 2010, EPA would determine whether it had attained the standard by evaluating air quality data from the three previous calendar years (i.e. 2007, 2008, and 2009).

For any areas that are granted the full 5 year attainment date extension under section 172, the attainment date would be no later than April 5, 2015. For such areas, EPA would determine whether they have attained the standard by evaluating air quality data from 2012, 2013, and 2014. Section 51.1004 of the proposed regulations addressed the attainment date requirement. Section 51.1004(b) provided that in their attainment demonstrations, States would propose an attainment date representing attainment as expeditiously as practicable based upon implementation of existing Federal and State measures, and all new reasonable local and intrastate measures. The EPA would approve a particular attainment date based on its review of the attainment demonstration.

Determining Whether an Area Has Attained. The EPA has the responsibility for determining whether a nonattainment area has attained the standard by its applicable attainment date. Section 179(c)(1) of the Act requires EPA to make determinations of attainment no later than 6 months following the attainment date for the area. Under section 179(c)(2), EPA must publish a notice in the **Federal Register** identifying those areas which failed to attain by the applicable attainment date. The statute further provides that EPA may revise or supplement its determination of attainment for the affected areas based upon more complete information or analysis concerning the air quality for the area as of the area's attainment date.

Section 179(c)(1) of the Act provides that the attainment determination for an area is to be based upon an area's ''air quality data as of the attainment date.'' The EPA will make the determination of whether an area's air quality is meeting the $PM_{2.5}$ NAAQS by the applicable attainment date primarily based upon data gathered from the air quality monitoring sites which have been entered into EPA's Air Quality System (AQS) database. No special or additional SIP submittal will be required from the State for this determination.

A $PM_{2.5}$ nonattainment area's air quality status is determined in accordance with appendix N of 40 CFR part 50. To show attainment of the 24-hour and annual standards for $PM_{2.5}$, the most recent three consecutive years of data prior to the area's attainment date must show that $PM_{2.5}$ concentrations over a three-year period are at or below the levels of the standards. A complete year of air quality data, as described in part 50, Appendix N, comprises of all 4 calendar quarters with each quarter containing data from at least 75 percent of the scheduled sampling days. The annual standard for $PM_{2.5}$ is attained when the 3-year average annual mean concentration is less than or equal to 15.05 $\mu g/m^3$. The 24-hour standard for $PM_{2.5}$ is met when the average of 98th percentile values for three consecutive calendar years at each monitoring site is less than or equal to 65.5 $\mu g/m^3$.

The EPA will begin processing and analyzing data related to the attainment of $PM_{2.5}$ areas immediately after the applicable attainment date for the affected areas. Current EPA policy, under 40 CFR part 58, sets the deadline for submittal of air quality data into the AQS database for no later than 90 days after the end of the calendar year.

[14] More information on the Clean Air Interstate Rule (CAIR) is available at: *http://www.epa.gov/cair.*

While EPA may determine that an area's air quality data indicates that an area may be meeting the $PM_{2.5}$ NAAQS for a specified period of time, this does not eliminate the State's responsibility under the Act to adopt and implement an approvable SIP. If EPA determines that an area has attained the standard as of its attainment date, the area will remain classified as nonattainment until the State has requested, and EPA has approved, redesignation to attainment for the area.

In order for an area to be redesignated as attainment, the State must comply with the five requirements listed under section 107(d)(3)(E) of the Act. This section requires that:

—EPA has determined that the area has met the $PM_{2.5}$ NAAQS;
—EPA has fully approved the state's implementation plan;
—The improvement in air quality is due to permanent and enforceable reductions in emissions;
—EPA has fully approved a maintenance plan for the area;
—The State(s) containing the area have met all applicable requirements under section 110 and part D.

2. Establishing Attainment Dates

a. Background

The EPA proposed rule language on attainment dates that closely tracks the statutory language. In the preamble, EPA noted that the attainment date that is as expeditious as practicable should reflect the projected impact of existing national and State programs (e.g. partial implementation of the CAIR rule, final Acid Rain Program, motor vehicle tier II standards and heavy-duty diesel engine standards, NO_X SIP call, State legislation such as Clean Smokestacks bill in North Carolina) as well as additional reasonable measures required for the $PM_{2.5}$ nonattainment SIP.

With respect to its authority to extend an area's date beyond 5 years, EPA stated in the preamble that the State can submit a SIP demonstrating that it is impracticable to attain by the 5-year attainment date: ''As stated previously, under section 172(a)(2)(A), EPA may grant an area an extension of the initial attainment date for a period of one to 5 years. States that request an extension of the attainment date under this provision of the CAA must submit a SIP by April 5, 2008 that includes, among other things, an attainment demonstration showing that attainment within 5 years of the designation date is impracticable. It must also show that the area will attain the standard by an alternative date that is as expeditious as practicable, but in no case later than 10 years after the designation date for the area (i.e. by April 5, 2015 for an area with an effective designation date of April 5, 2005). An appropriate extension in some cases may be only 1 or 2 years—a 5-year extension is not automatic upon request.

The attainment demonstration must provide sufficient information to show that attainment by the initial attainment date is impracticable due the severity of the nonattainment problem in the area, the lack of available control measures, and any other pertinent information related to these statutory criteria. States requesting an extension of the attainment date must also demonstrate that all local control measures that are reasonably available and technically feasible for the area are currently being implemented to bring about expeditious attainment of the standard by the alternative attainment date for the area. The State's plan will need to project the emissions reductions expected due to Federally enforceable national standards, State regulations, and local measures such as RACT and RACM, and then conduct modeling to project the level of air quality improvement in accordance with EPA's modeling guidance. The EPA will not grant an extension of the attainment date beyond the initial 5 years required by section 172(a)(2)(A) for an area if the State has not considered the implementation of all RACM and RACT local control measures for the area (see section III.I for a more detailed discussion of RACT and RACM). The EPA also will examine whether the State has adequately considered measures to address intrastate transport of pollution from sources within its jurisdiction. In attainment planning, States have the obligation and authority to address the transport of pollution from one area of the State to another. Any decision made by EPA to extend the attainment date for an area beyond its original attainment date will be based on facts specific to the nonattainment area at issue and will only be made after providing notice in the **Federal Register** and an opportunity for the public to comment.''

b. Final Rule

We are adopting the approach described above from the proposed rule. We also wish to clarify language that was in the preamble to the proposed rule regarding the criteria for an extension. The preamble stated that attainment date extensions would be based on the two statutory extension criteria—''the severity of nonattainment, and the availability and feasibility of pollution control measures,''—as well as ''other pertinent information which shows that additional time is required for the area to attain the standard.'' The CAA does not include this third clause and the regulatory text for the final rule does not include this third clause. The intent of this language in the preamble to the proposal was that States could include ''other pertinent information'' related to the two statutory criteria.

c. Comments and Responses

Comment: Some commenters expressed concern that EPA's preamble language appeared to assert a new basis for granting extensions not provided by the statute. They said EPA has authority to extend the attainment date under Section 7502(a)(2) based solely on consideration of two enumerated factors: the severity of nonattainment, and the availability and feasibility of control measures.

Response: The EPA agrees that extensions must be based upon the two factors in the statute, which are quite broad. A clarification of the preamble phrase cited by the commenter is provided above. The phrase in question—''any other pertinent information which shows that additional time is required for the area to attain the standard''—refers to information that relates to the two statutory factors.

Comment: One commenter stated that an area should qualify for an extension only if the area will implement stringent local controls, yet still cannot practicably attain by the five-year deadline. The commenter stated that at a minimum, EPA must require states to adopt RACM for both mobile and stationary sources before granting an extension. Another commenter said that given the difficulty many areas will have in meeting the five-year deadline for attainment of the $PM_{2.5}$ NAAQS (and especially in light of the fact that the deadline occurs only 2 years after states are to submit attainment SIPs), EPA should provide maximum flexibility in allowing extensions to the full 10-year period.

Response: The EPA agrees that extensions should be granted only if an area cannot practicably attain within 5 years despite application of all reasonable measures, including RACM. Although some measures can be implemented within a year or two, many measures require a longer period for installation of controls or full program implementation. In light of the limited time period between the SIP submittal deadline and the 5-year date, EPA believes that a significant number of areas may warrant extensions ranging from one to 5 years, with the length of

extension depending on the factors described above.

Comment: One commenter advocated that EPA include in this final rule a determination of those areas for which attainment within 5 years is impracticable. Another commenter advocated that EPA establish guidance based on EPA national modeling conducted last year to establish 2015 as constituting expeditious attainment for certain areas.

Response: The EPA is not determining in this rulemaking the areas that should receive extensions or should receive the maximum 10-year attainment date, for several reasons. First, EPA did not propose such an approach. Therefore, the public has not had the opportunity to comment on the approach or on the technical information on which EPA would make such judgments.

Second, EPA believes that modeling being conducted by the states, with updated inventories and finer grids, will generally provide a more reliable basis for projecting future $PM_{2.5}$ base case levels than national modeling conducted by EPA with older information. State modeling of future year $PM_{2.5}$ levels that has been conducted to date indicates that some areas will start closer or farther from the standard than EPA had projected.

Third, the SIP process provides a forum for states to identify reasonable controls and conduct analyses to determine the appropriate attainment date for an area. This process provides for input from expert stakeholders, the general public, other states which may share the same multi-State nonattainment area, and EPA on decisions regarding controls and attainment dates. At this time, EPA does not have the benefit of this process to inform a judgment as to when areas can practicably attain. States are responsible for developing RACM demonstrations; at this time, EPA lacks the information to conduct a credible RACM demonstration for all $PM_{2.5}$ nonattainment areas.

Fourth, no State commenter advocated that EPA attempt to make these judgments on attainment dates in advance of the State SIP process. The statute gives the states the lead in developing State implementation plans.

Comment: Another commenter recommends that an area should receive an attainment date extension when collectively the following conditions have been met:

- It is proven through modeling that the region is adversely effected by transport of $PM_{2.5}$ emissions from up wind sources beyond that State's control;
- A State has submitted and committed to implementing all Federal $PM_{2.5}$ emission reduction requirements in a timely manner; and,
- The extension concept is approved through the State air agency or through the MPO Interagency Consultation Process at the MPO level if applicable.

Response: This commenter advocates for attainment date extensions without any consideration of reasonable local measures. As stated above, EPA believes that extensions should be granted only if an area cannot practicably attain within 5 years despite application of all reasonable measures, including RACM. Although some measures can be implemented within a year or two, many measures may require a longer period for installation of controls or full program implementation. In light of the limited time period between the SIP submittal deadline and the 5-year date, EPA believes that a significant number of areas may warrant extensions ranging from one to 5 years, with the length of extension depending on the factors described above.

3. Attainment Dates: 1-Year Extensions

a. Background

Subpart 1 provides for States to request two 1-year extensions of the attainment date for a nonattainment area under limited circumstances. Section 172(a)(2)(C) of the CAA provides that EPA initially may extend an area's attainment date for 1 year, provided that the State has complied with all the requirements and commitments pertaining to the area in the applicable implementation plan, and provided that the area has had no more than a minimal number of ''exceedances'' of the relevant standard in the preceding year. Because the $PM_{2.5}$ standards do not have exceedance-based forms but are based on 3-year averaging periods, we interpret the air quality test in 40 CFR 51.1005 to mean that the area would need to have ''clean data'' for the third of the 3 years that are to be evaluated to determine attainment.[15] By this we mean that for the third year, the air quality for all monitors in the area as analyzed in accordance with Appendix N to 40 CFR part 50 each must have an annual average of 15.0 $\mu g/m^3$ or less, and a 98th percentile of 24-hour monitoring values of 65 $\mu g/m^3$ or less in order to qualify for a 1-year extension. (Given the rounding provisions specified in 40 CFR part 50, Appendix N, these criteria would be satisfied if the concentrations before final rounding are less than an annual average of 15.05 $\mu g/m^3$ and a 24-hour value of 65.5 $\mu g/m^3$.)

For example, suppose an area in violation of the annual standard has an attainment date of April 2010, and its annual average for 2007 was 15.8 and for 2008 was 15.6. If the annual average for the area in 2009 is 14.9, then the 3-year average would be 15.4, and it would not have attained the standard. We interpret section 172(a)(2)(C) as allowing the area to submit a request to EPA for a 1-year extension of its attainment date to 2011 (provided the State has also complied with its requirements and commitments) since the 14.9 ambient air quality value in the third year (2009) met the test of being at or below 15.0. Section 51.1005(a) of the proposed regulation addresses the initial 1-year attainment date extension.

The air quality measured in 2010 in conjunction with prior data will determine if the area attains the standard, qualifies for a second 1-year extension, or does not attain the standard. For example, if the area's annual average for 2010 is 14.3, then its 3-year average for 2008–2010 would be 14.9 and it would have met the annual standard.

If the area's annual average for 2010 is 14.9, however, then its 3-year average for 2008–2010 would be 15.1. In this situation the area would not have attained the standard, but the area would meet the air quality test for the second of the 1-year extensions allowed under section 172(a)(2)(C), because the 2010 annual average was at or below 15.0. Section 51.1005(b) of the proposed rule addresses the second 1-year attainment date extension. After obtaining a second 1-year extension, the State would evaluate whether the air quality values in 2011, in conjunction with 2009 and 2010 data, bring the area into attainment.

Pursuant to section 172(a)(2)(C), States must submit additional information to EPA to demonstrate that they have complied with applicable requirements, commitments, and milestones in the implementation plan. This information is needed in order for EPA to make a decision on whether to grant a 1-year attainment date extension. The EPA will not be inclined to grant a 1-year attainment date extension to an area unless the State can demonstrate that it has met important requirements contained in the area's implementation plan. States must demonstrate that: (1) Control measures have been submitted in the form of a SIP revision and substantially implemented to satisfy the requirements of RACT and RACM for the area, (2) the area has made emissions reductions progress that

[15] See section 51.1005 of the proposed regulation.

represents reasonable further progress (RFP) toward attainment of the NAAQS, and (3) trends related to recent air quality data for the area indicate that the area is in fact making progress toward attainment of the standard. Any decision made by EPA to extend the attainment date for an area will be based on facts specific to the nonattainment area at issue, and will only be made after providing notice in the **Federal Register** and an opportunity for the public to comment.

If an area fails to attain the standard by the attainment date, EPA would publish a finding to this effect in accordance with section 179 of the CAA. The area then would be required, within 1 year of publication of this finding, to develop a revised SIP containing additional emission reduction measures needed to attain the standard as expeditiously as practicable.

b. Final Rule

The final rule retains the proposed criteria for states to receive a 1-year attainment date extension for a nonattainment area.

c. Comments and Responses

Comment: A number of commenters supported EPA's ability to grant a 1-year attainment date extension if monitoring data indicate that the $PM_{2.5}$ levels during the most recent year were below 15.05 $\mu g/m^3$.

Response: The EPA agrees with these comments.

Comment: Some commenters recommended that a 1-year extension be provided if the trend line of the area's emissions levels or air quality data projects attainment in the extension year.

Response: The EPA believes that 1-year extensions should be based on air quality data, which can be assessed quickly after the end of the year. Basing such extensions solely on emissions trends would be impractical due to the longer turnaround time needed to evaluate emissions changes affecting a monitor.

Comment: One commenter believes the current requirement is overly stringent and inconsistent with the statute. The commenter believes that EPA's proposed approach incorrectly defines the statutory language referring to a ''minimal number of exceedances'' of the standard in the previous year as ''zero'' exceedances. Alternatively, the commenter suggests EPA could withdraw this provision and provide more detailed guidance giving the Agency and states some flexibility to demonstrate that exceedances were minimal in a given case since nothing in the statute requires the rigid definition of minimal that EPA proposes.

Response: The EPA believes the policy in the final rule is a reasonable application of the statutory language to a standard not based on exceedances. The EPA does not believe it would be appropriate to provide a 1-year extension to an area with air quality data showing it violating the standard over the 3 years prior to the attainment year.

4. Achieving ''Clean Data''

a. Background

Section III.D of the preamble to the proposed rule describes the incentives for attaining the standards prior to April 2008, when SIP submittals are due, or prior to an area's approved attainment date. Areas with design values just over the level of the standard may be able to achieve reductions in the local area or in the State so that, when their effect is considered in combination with reductions achieved under national programs, they may be sufficient to attain the standards before SIPs are due in 2008. For example, if monitoring in a nonattainment area shows that the air quality for 2004–2006 meets the standards, then the area may be subject to reduced regulatory requirements and be redesignated as ''attainment.''

The EPA issued a ''Clean Data'' policy memorandum in December 2004 describing possible reduced regulatory requirements for areas that attain the standards, but have not yet been redesignated as attainment.[16]

b. Final Rule

In the proposed rule, EPA indicated that it had issued this ''Clean Data'' policy to apply for purposes of the $PM_{2.5}$ standards. In this action EPA is finalizing as a rule the statutory interpretation that is embodied in the policy. Section 51.1004(c). The text of the final rule encapsulates the statutory interpretation set forth in the policy. Determinations as to whether individual areas have attained the $PM_{2.5}$ standard and thus qualify for application of the new clean data rule will be made in the context of rulemakings for those individual areas.

The preamble to the proposed rule mistakenly stated that if an area achieved ''clean data,'' it would be ''relieved of the requirements to implement the nonattainment NSR program otherwise required for nonattainment areas, and instead would implement the PSD program.'' The EPA wishes to clarify that the Clean Data Policy does not provide for suspension of the requirements for NSR nor for RACT. The provisions at issue in the Clean Data Policy include the requirements for an attainment demonstration and other related requirements, reasonable further progress, and contingency measures.

c. Comments and Responses

Comment: One commenter stated that EPA has absolutely no authority to waive NSR or any of the CAA's other requirements for nonattainment areas merely because a nonattainment area has 3 years of clean data, nor does EPA have authority to waive mandatory requirements of the CAA such as NSR, RACT, and RFP merely because EPA or the State claims they are not needed for attainment. The commenter believes that the only way that a nonattainment area can cease implementing controls and requirements mandated for such areas is to seek and obtain redesignation to attainment, and demonstrate in the process that the controls and requirements are not needed for maintenance of standards. The CAA has explicit procedures and prerequisites for redesignating nonattainment areas to attainment (CAA sections 107(d)(3)(E) and 175A). The EPA's ''clean data'' proposal would illegally circumvent those requirements.

Response: The Clean Data policy does not waive requirements for NSR nor for RACT. However, EPA believes that ''clean data'' policies for the ozone and fine particle programs are based on a reasonable interpretation of the CAA. The Clean Data Policy is the subject of two EPA memoranda setting forth our interpretation of the provisions of the Act as they apply to areas that have attained the relevant NAAQS. The EPA also finalized the statutory interpretation set forth in the policy in a final rule, 40 CFR 51.918, as part of its Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard—Phase 2 (Phase 2 Final Rule). See discussion in the preamble to the rule at 70 FR 71645–71646 (November 29, 2005). The legal rationale for the Clean Data policy is explained in our Phase 2 Final Rule, in our December 14, 2004 memorandum from Stephen D. Page entitled ''Clean Data Policy for the Fine Particle National Ambient Air Quality Standards'' (Page Memo), and in our May 10, 1995 memorandum from John S. Seitz, entitled ''Reasonable Further Progress, Attainment

[16] Memorandum of December 14, 2004, from Steve Page, Director, EPA Office of Air Quality Planning and Standards to EPA Air Division Directors, ''Clean Data Policy for the Fine Particle National Ambient Air Quality Standards.'' This document is available at: *http://www.epa.gov/pmdesignations/guidance.htm.*

Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard'' (Seitz memo). We adopt and reiterate those explications here.

The EPA has also explained its rationale for applying the Clean Data policy in rulemaking actions associated with nonattainment areas for the PM_{10} and 1-hour ozone standards. For rulemaking actions applying the Clean Data policy to the PM_{10} standards, see 71 FR 27440 (May 11, 2006) (Weirton, WVA), 71 FR 13021 (March 14, 2006) (Yuma, AZ), 71 FR 6352 (February 8, 2006) (Ajo, AZ). For a discussion of the legal rationale supporting rulemaking actions applying the Clean Data policy to the 1-hour ozone standards, see, for example, 67 FR 49600 (July 31, 2002); 65 FR 37879 (June 19, 2000) Cincinnati-Hamilton, Ohio-Kentucky); 61 FR 20458 (May 7, 1996) (Cleveland Akron-Lorain, Ohio); 66 FR 53094 (October 19, 2001) (Pittsburgh-Beaver Valley, Pennsylvania); 61 FR 31832 (June 21, 1996 (Grand Rapids, Michigan); 60 FR 36723 (July 18, 1995) (Salt Lake and Davis Counties, Utah); 68 FR 25418 (May 12, 2003) (St Louis, Missouri); 69 FR 21717 (April 22, 2004) (San Francisco Bay Area).

The EPA has further elaborated on its legal rationale for the Clean Data Policy in briefs filed in the 10th, 7th, and 9th Circuits, and hereby incorporates those briefs insofar as relevant here. See *Sierra Club* v. *EPA,* No. 95–9541 (10th Cir.), *Sierra Club* v. *EPA,* No. 03–2839, 03–3329 (7th Cir.), *Our Children's Earth Foundation* v. *EPA,* No. 04–73032 (9th Cir.). As stated in the policy, the attainment demonstration, RFP requirements, and contingency measure requirement are designed to bring an area into attainment. Once this goal has been achieved, it is appropriate to suspend the obligation that States submit plans to meet these goals, so long as the area continues to attain the relevant standard. The Tenth, Seventh and Ninth Circuits have all upheld EPA rulemakings applying the Clean Data Policy. See *Sierra Club* v. *EPA,* 99 F. 3d 1551 (10th Cir. 1996); *Sierra Club* v. *EPA,* 375 F. 3d 537 (7th Cir. 2004); *Our Children's Earth Foundation* v. *EPA,* No. 04–73032 (9th Cir. June 28, 2005 (Memorandum Opinion).

The EPA has explained in its memoranda on the Clean Data Policy for $PM_{2.5}$ and for ozone that it is reasonable to interpret the provisions regarding RFP and attainment demonstrations, along with certain other related provisions, as not requiring further submissions to achieve attainment for so long as the area is in fact attaining the standard. Under the policy, EPA is not granting an exemption from any applicable requirement under Part D. Rather, EPA has interpreted these requirements as not applying for so long as the area remains in attainment with the standard. This is not a waiver of requirements that by their terms apply; it is a determination that certain requirements are written so as to be operative only if the area is not attaining the standard.

CAA section 172(c)(2) provides that SIP provisions in nonattainment areas must require ''reasonable further progress.'' The term ''reasonable further progress'' is defined in section 171(1) as ''such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable NAAQS by the applicable date.'' Thus, by definition, the ''reasonable further progress'' provision requires only such reductions in emissions as are necessary to attain the NAAQS. If an area has attained the NAAQS, the purpose of the RFP requirement will have been fulfilled, and since the area has already attained, showing that the State will make RFP towards attainment will ''have no meaning at that point.'' The EPA's General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990 (General Preamble) 57 FR 13498, 13564 (April 16, 1992).

CAA section 172(c)(1), the requirement for an attainment demonstration, provides in relevant part that SIPs ''shall provide for attainment of the [NAAQS].'' The EPA has interpreted this requirement as not applying to areas that have reached attainment. If an area has attained the standard, there is no need to submit a plan demonstrating how the area will reach attainment. In the General Preamble (57 FR 13564), EPA stated that no other measures to provide for attainment would be needed by areas seeking redesignation to attainment since ''attainment will have been reached.'' See also Memorandum from John Calcagni, ''Procedures for Processing Requests to Redesignate Areas to Attainment,'' September 4, 1992, at page 6.

CAA section 172(c)(9) provides that SIPs in nonattainment areas ''[S]hall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the [NAAQS] by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or [EPA].''

This contingency measure requirement is inextricably tied to the reasonable further progress and attainment demonstration requirements. Contingency measures are implemented if reasonable further progress targets are not achieved, or if attainment is not realized by the attainment date. Where an area has already achieved attainment by the attainment date, it has no need to rely on contingency measures to come into attainment or to make further progress to attainment. As EPA stated in the General Preamble:

> ''The section 172(c)(9) requirements for contingency measures are directed at ensuring RFP and attainment by the applicable date.'' 57 FR 13564. Thus these requirements no longer apply when an area has attained the standard.

It is important to note that should an area attain the $PM_{2.5}$ standards based on three years of data, its obligation to submit an attainment demonstration is not waived but is only suspended. If the area then has air quality concentrations in the following year such that the area exceeds the standard for years 2 through 4, then the area's obligation to submit an attainment demonstration is back in effect.

The determination of attainment contemplated by the Clean Data Policy does not purport to be a redesignation, and thus the requirements for redesignation under section 107(d) are not applicable. Nor does the Clean Data Policy avoid or illegally circumvent the redesignation requirements of section 107 of the CAA. All of the requirements for redesignation remain in effect and must be satisfied for an area to be redesignated. *Sierra Club* v. *EPA*, 99 F.3d at 1557–1558. The Clean Data Policy is simply an interpretation of certain provisions of the CAA, whose express purpose is to achieve attainment of the standard, as not requiring SIP revisions to be made by the State for so long as the area continues to attain the standard. The policy does not purport to exempt areas from requirements that are inapplicable only if an area is redesignated to attainment. It interprets certain provisions which are written in such a way as to impose requirements only upon areas that are not attaining the NAAQS, regardless of whether they have been redesignated to attainment. The EPA has not provided for any waiver from statutory requirements that was not provided by Congress. The area at issue remains designated nonattainment, and is subject to the risk that if a violation occurs it will have to

adopt and implement reasonable further progress requirements, contingency measures, and an attainment demonstration, unless it is redesignated to attainment. In order to be redesignated to attainment, however, the area will have to satisfy all of the requirements of section 107(d)(3)(E), including the requirement for a long-term maintenance plan.

While a determination of attainment is not equivalent to a redesignation to attainment, nothing in the Act compels EPA to wait until an area meets all the requirements for redesignation before EPA makes a determination that the area is in attainment with the standard, thereby suspending the requirements for certain provisions related to attainment. Indeed, section 179(c) of the Act requires EPA to make an attainment determination within six months after an area's applicable attainment date whether or not the EPA has made a finding with respect to redesignation. The EPA's interpretation of the Act's provisions not to require, once attainment has been reached, certain plan submissions whose purpose is to assure attainment, is not at odds with the requirements for redesignation. Nor does EPA's construction of the statute adversely impact planning for maintenance. An area that is monitoring attainment, but is still designated as a nonattainment area, retains strong incentives to seek redesignation to attainment, and remains subject to the requirement to demonstrate maintenance in order to be redesignated. For a detailed discussion of the relationship of redesignation requirements and attainment determinations, see the discussions in the EPA briefs in *Our Children's Earth Foundation* v. *EPA*, supra at pp. 43–60., *Sierra Club* v. *EPA* No. 95–9541 (10th Cir.) at 29–43, and *Sierra Club* v. *EPA* Nos. 03–2839, 03–3329 (7th Cir.) at 33–44 which are contained in the docket for this rulemaking.

Comment: A commenter noted that EPA's proposal suggested that areas attaining the standard would be subject to reduced regulatory requirements. The commenter believed that EPA's interpretation should be codified in regulatory form, in order to assure that areas legally meeting the current $PM_{2.5}$ standard and those requesting redesignation be enabled to be redesignated and to benefit from the interpretation through regulation, rather than by guidance or policy.

Response: The EPA has adopted the commenter's suggested approach of codifying its Clean Data Policy interpretation for $PM_{2.5}$ in regulatory form. Section 51.1004(c). As it did for ozone in its Phase II Ozone Implementation Rule, EPA is including in this rulemaking a regulation that encapsulates the statutory interpretation that is embodied in its Clean Data Policy for $PM_{2.5}$, set forth above. As noted in the response to comment above, determinations as to whether individual areas have attained the $PM_{2.5}$ standard and thus qualify for application of the rule will be made in the context of rulemakings for those individual areas. The EPA believes, however, that encapsulating its interpretation in regulatory form will lend clarity and consistency to the process of applying its interpretation.

E. Modeling and Attainment Demonstrations

1. Background

[Section III.F.1 of November 1, 2005 proposed rule (70 FR 66007); sec 51.1007 in draft and final regulatory text]

As noted in the proposal, Section 172(c) requires States with nonattainment areas to submit an attainment demonstration. An attainment demonstration consists of: (1) Technical analyses that locate, identify, and quantify sources of emissions that are contributing to violations of the $PM_{2.5}$ NAAQS; (2) analyses of future year emissions reductions and air quality improvement resulting from already-adopted national and local programs, and from potential new local measures to meet the RACT, RACM, and RFP requirements in the area; (3) adopted emission reduction measures with schedules for implementation; and (4) contingency measures required under section 172(c)(9) of the CAA.

a. Final Rule

The requirements from the proposal are unchanged. Each State with a nonattainment area will be required to submit a SIP with an attainment demonstration that includes analyses supporting the State's proposed attainment date. States must show that the area will attain the standards as expeditiously as practicable and it must include an analysis of whether implementation of reasonably available measures will advance the attainment date.

2. Areas That Need To Conduct Modeling

[Section III.F.2 of November 1, 2005 proposed rule (70 FR 66007)]

a. Background

All nonattainment areas need to submit an attainment demonstration, but in some cases, States may not need new, local-scale modeling analyses. In the proposed rule, EPA proposed that States may use in a $PM_{2.5}$ attainment demonstration certain local, regional and/or national modeling analyses that have been developed to support Federal or local emission reduction programs, provided the modeling meets the attainment modeling criteria set forth in EPA's modeling guidance. The proposal also stated that nonattainment areas for which local, regional, or national scale modeling demonstrates the area will not attain the standard within 5 years of designation would be required to submit an attainment demonstration SIP that includes new modeling showing attainment of the standards as expeditiously as practicable.

b. Final Rule

In the final rule, EPA is reaffirming the potential use of national and/or regional modeling as part of an attainment demonstration. We are also clarifying the types of modeling analyses that may be useful as a ''primary'' modeling analysis and as a ''supplemental'' analysis. The proposal suggested that it may be appropriate, in certain circumstances, for a State to submit regional or national modeling as the sole (primary) modeling analysis in its attainment demonstration. This implies that the State would not need to conduct local modeling analyses. We wish to further define the differences between ''national'', ''regional'', and ''local'' modeling analyses. In this context, national analyses are generally those conducted by EPA in support of national or regional rules. Regional and local modeling analyses are generally those conducted by the RPOs and/or States for the purpose of developing State Implementation Plans (SIPs). EPA has conducted national scale modeling for a variety of rules and analyses. Additionally, the RPOs and many States are conducting regional and/or local scale modeling of $PM_{2.5}$ and regional haze across the country. The national scale of the EPA modeling analyses requires basic assumptions concerning local model inputs. Compared to regional or local modeling done by the States and/or RPOs, EPA modeling may, in some cases, use coarser grid resolution, use inventories that are not as refined, and model performance may be highly variable from area to area. For these reasons, national scale modeling may not always be appropriate for local area attainment demonstrations.

Therefore, we believe that regional or local modeling conducted by the States or RPOs is best suited as the primary modeling analysis for a modeled

attainment demonstration. The local modeling is more likely to meet the recommendations contained in EPA's modeling guidance. However, some areas having design values close to the standard may be projected to come into attainment within five years based on modeling analyses of national and regional emission control measures (e.g. CAIR) that are scheduled to occur through 2009. Regional scale modeling for national rules such as the Tier II motor vehicle standards, the Heavy-duty Engine standards, the Nonroad Engine standards, and CAIR indicate major reductions in $PM_{2.5}$ by 2010. A portion of these benefits will occur in the 2006–2009 $PM_{2.5}$ attainment timeframe.

Experience with past ozone attainment demonstrations has shown that the process of performing detailed photochemical grid modeling to develop an attainment demonstration can be very resource intensive for States. The EPA believes that it would be appropriate for States to leverage resources by collaborating on modeling analyses to support SIP submittals, or by making use of recent modeling analyses that are completed prior to the SIP submittal date. For this reason, EPA recognizes that States may use in a $PM_{2.5}$ attainment demonstration certain local, regional and/or national modeling analyses that have been developed to support Federal or local emission reduction programs, provided the modeling meets the attainment modeling criteria set forth in EPA's modeling guidance (described below). As with all SIPs under subpart 1, the State must demonstrate that the area will attain the $PM_{2.5}$ standards as expeditiously as practicable. The judgment of whether the modeling is appropriate for an area should be made by the State(s) and their respective EPA regional office on a case-by-case basis.

c. Comments and Responses

Comment: There were many commenters that agreed that States should be able to use EPA modeling or other national or regional modeling as a modeled attainment demonstration. One commenter recommended that the final rule require States to show that the existing modeling incorporates realistic assumptions, accurately reflects local emissions and trends, and provides adequate model performance for the local nonattainment area.

Response: We agree that national and regional modeling may be used as part of an attainment demonstration as long as it is shown to be applicable to the local area. This is consistent with the proposal where we said that existing modeling should ''meet the attainment modeling criteria set forth in EPA's modeling guidance.'' Part of the analysis to determine if existing modeling meets the criteria in the modeling guidance is to assess whether the modeling incorporates realistic assumptions, accurately reflects local emissions and trends, and provides adequate model performance for the local nonattainment area.

Comment: Some commenters thought States should be able to use EPA modeling in the absence of an analysis of the applicability of the modeling for a local nonattainment area. One commenter said that EPA should determine that States should not have to do any additional modeling analyses if the CAIR modeling showed they were expected to attain the NAAQS by 2010.

Response: While we acknowledge there may be some circumstances in which national or regional modeling would be appropriate to use without local modeling and allow for such use, we disagree that national modeling should be used in support of an attainment demonstration without further analysis of the modeling assumptions for a particular area. National scale modeling may not always be appropriate for local areas. Most often, national scale EPA modeling is best suited for use as a supplemental analysis or as part of a ''weight of evidence'' demonstration. The modeling guidance recommends supplemental analyses for all attainment demonstrations. The guidance specifically recommends the examination of other modeling studies as a supplemental analysis. The EPA modeling as well as other ''non-local'' modeling can be used for this purpose. The ''weight'' of this alternative modeling in an attainment demonstration should be guided by how well the modeling system is suited for the local nonattainment area. States should consult with their EPA regional offices for further guidance and recommendations. As such, we do not believe it to be appropriate to determine a priori that CAIR or any other modeling analyses are appropriate to use in a local attainment demonstration for any or all nonattainment areas.

Comment: Several commenters believe that States should be able to use existing EPA modeling (such as CAIR), as the basis for an extension of the area's attainment date, if it shows that the nonattainment area may not be able to attain the NAAQS by 2010. They believe that the State should not have to do additional modeling to show that they need an attainment date extension.

Response: We disagree with this comment. The CAIR modeling included national controls that are expected to be in place by 2010 (including the CAIR rule itself), as well as existing state and local controls reflected in the inventory used in the CAIR analysis. It did not include any additional local controls that could be implemented under RACT and RACM requirements for the 1997 standards that may bring the area into attainment sooner. Nonattainment areas are required to attain the NAAQS as expeditiously as practicable. Therefore, updated modeling of existing controls as well as additional local controls is needed before an attainment date extension can be granted. Additional information on attainment dates and extensions is contained in the preamble to the final rule, section II.D., and additional information on RACT and RACM requirements is contained in section II.F.

Comment: Several commenters noted an apparent inconsistency in the language concerning who would be required to perform ''new'' local-scale modeling. First, there are potentially conflicting statements in the proposal when EPA states that areas with an attainment date of 2010 will need to conduct local-scale modeling to project the estimated level of air quality improvement in accordance with EPA's modeling guidance. This conflicts with the proposed ability for States to use existing national or regional modeling as their modeled attainment demonstration. Second, a portion of a sentence was removed from the **Federal Register** version of the notice which differs from the pre-**Federal Register** version. The published version implies that all nonattainment areas would be required to submit new modeling.

Response: We agree that there are inconsistencies in the proposal preamble text. To clarify, new local-scale modeling is required for areas that are not expected to come into attainment by 2010. For other areas, there may be national or regional modeling which may be applicable to the area which shows they are likely to come into attainment. As noted earlier, national scale modeling is best suited for use as a supplemental analysis, but in some cases may be acceptable evidence that an area will attain by 2010.

Additionally, the preamble language in the **Federal Register** contained an error. A portion of a sentence was mistakenly removed, which led to some confusion. The language in the FR notice (FR page 66008) stated ''Nonattainment areas would be required to submit an attainment demonstration SIP that includes new modeling showing attainment of the

standards as expeditiously as practicable. The new modeling will need to include additional emissions controls or measures in order to demonstrate attainment.'' The language should have read, ''Nonattainment areas *for which local, regional, or national scale modeling demonstrates the area will not be in attainment of the NAAQS within 5 years of designation* would be required to submit an attainment demonstration SIP that includes new modeling showing attainment of the standards as expeditiously as practicable. The new modeling will need to include additional emissions controls or measures in order to demonstrate attainment.'' This should clarify that States that cannot show attainment within 5 years will need to develop new modeling analyses which contain additional control strategies which show how and when they expect to attain the $PM_{2.5}$ NAAQS.

Comment: One commenter maintained that relying on large-scale regional modeling alone may allow for $PM_{2.5}$ hot spots (i.e. small unmonitored areas projected to exceed the standard) to exist past the attainment date.

Response: We agree that nonattainment areas with potential hotspot issues (relatively high concentrations and/or gradients of primary $PM_{2.5}$) should not rely exclusively on regional modeling. The EPA's attainment demonstration modeling guidance attempts to address several aspects of hotspot issues in both monitored and unmonitored areas [17]. The modeled attainment tests contained in EPA's modeling guidance are primarily monitor based tests. Ambient data is combined with the model predicted relative change in PM components to determine if attainment of the standards is likely in the future. There are several aspects of the attainment test. In most cases, States will run a photochemical grid model to determine the future year predicted $PM_{2.5}$ concentrations at monitors. The modeling guidance generally recommends that for urban scale $PM_{2.5}$ modeling, the State performs modeling analyses at 12 kilometer grid resolution or finer. There is an additional component to the attainment test for areas that have measured relatively high concentrations and/or gradients of primary $PM_{2.5}$ at monitors. In these cases, we recommend running a Gaussian dispersion model for potential primary PM sources, to determine the local impact of changes in primary PM emissions (from the modeled sources) on predicted concentrations at the monitor(s).

In addition, we describe an ''unmonitored area analysis'' which uses interpolated ambient data combined with gridded model outputs to examine whether potential violations of the NAAQS may occur in unmonitored areas. If potential violations are indicated, we recommend further analysis of the problem through additional local modeling. Options for State action to address such a situation could include imposition of reasonably available control technology to reduce emissions, or the deployment of an air quality monitor to further characterize the problem.

We believe that the combination of these model-based tests will adequately determine whether attainment of the standards is likely by the attainment date. We also believe that these tests address the issue of hotspots by recommending a combination of photochemical modeling, dispersion modeling of local sources, and additional monitoring and/or emissions controls.

3. Modeling Guidance

[Section III.F.3 of November 1, 2005 proposed rule (70 FR 66008)]

a. Background

Section 110(a)(2)(K)(i) states that SIPs must contain air quality modeling as prescribed by the Administrator for the purpose of predicting the effect of emissions on ambient air quality. The procedures for modeling $PM_{2.5}$ as part of an attainment SIP are contained in EPA's ''Guidance for Demonstrating Attainment of Air Quality Goals for $PM_{2.5}$ and Regional Haze.'' The proposal summarized several of the chapters in a draft version of the modeling guidance.

b. Final Rule

A draft of the $PM_{2.5}$ attainment demonstration and regional haze modeling guidance has now been revised (September 2006) and is available at *http://www.epa.gov/ttn/scram/guidance_sip.htm*. The draft $PM_{2.5}$ attainment demonstration and regional haze guidance has been incorporated into the ozone modeling guidance and is now called ''Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for the 8-Hour Ozone and $PM_{2.5}$ NAAQS and Regional Haze''. The final version of the modeling guidance will be available at the same location in the near future.

The revised draft $PM_{2.5}$ modeling guidance document is very similar to the previous draft version, although there were several changes and updates. Among them are new methods in treating $PM_{2.5}$ species components as part of the $PM_{2.5}$ attainment test; new methods for determining potential future year violations in unmonitored areas; new procedures for handling potential $PM_{2.5}$ ''hotspots''; and an increased reliance on supplemental analyses, including ''weight of evidence'' analyses. The EPA notes that the $PM_{2.5}$ attainment demonstration modeling guidance that we have released is separate from the Agency's future hot-spot modeling guidance for transportation conformity purposes.[18]

The modeling guidance describes how to estimate whether a control strategy to reduce emissions of particulate matter and its precursors will lead to attainment of the annual and 24-hour $PM_{2.5}$ NAAQS. Part I of the guidance describes a ''modeled attainment test'' for the annual and 24-hour $PM_{2.5}$ NAAQS. Both tests are similar. The output of each is an estimated future design value consistent with the respective forms of the NAAQS. If the future design value does not exceed the concentration of $PM_{2.5}$ specified in the NAAQS, then the primary modeled test is passed. The modeled attainment test applies to locations with monitored data.

A separate test is recommended to examine projected future year $PM_{2.5}$ concentrations in unmonitored locations.[19] Interpolated $PM_{2.5}$ ambient data, combined with modeling data, is used to predict $PM_{2.5}$ concentrations in unmonitored areas. The goal of this analysis is to identify areas without monitors that may be violating the $PM_{2.5}$ NAAQS, often due to high levels of primary $PM_{2.5}$ (both now and in the future). The details of the analysis are contained in the final modeling guidance.

The guidance also discusses modeling $PM_{2.5}$ at monitors where high concentrations of primary $PM_{2.5}$ are measured. In these cases, it may be beneficial to model the primary component of the $PM_{2.5}$ with a Gaussian dispersion model. Dispersion models are better able to capture the influence

[17] The recommendations contained in the modeled attainment demonstration guidance are separate from the Agency's future hot-spot modeling guidance for transportation conformity purposes.

[18] In the March 10, 2006, final transportation conformity rule (71 FR 12468), EPA committed to develop $PM_{2.5}$ and PM_{10} quantitative hot-spot modeling guidance for transportation conformity determinations for highway and transit projects of local air quality concern.

[19] Application of the unmonitored area analysis is limited to locations which are appropriate to allow the comparison of predicted $PM_{2.5}$ concentrations to the NAAQS, based on $PM_{2.5}$ monitor siting requirements and recommendations.

of primary PM sources where large concentration gradients may exist. Grid models spread out the PM emissions to the size of the grid (typically 4 or 12 km). This makes it difficult to judge the benefits of control strategies that may affect primary PM sources. The final modeling guidance recommends procedures for applying dispersion models in these situations.

The guidance also recommends the submittal of supplemental analyses as part of all attainment demonstrations. Supplemental analyses are modeling, emissions, and/or ambient data analyses that are submitted as part of a SIP, in addition to the primary modeled attainment test. The evaluation of supplemental analyses when the predicted concentrations in the primary attainment test are close to the NAAQS (slightly above or slightly below) is called a weight-of-evidence (WOE) analysis. This is simply a collection of evidence that aims to show that attainment of the standard is likely. The final version of the modeling guidance puts more emphasis on the submittal of supplemental analyses than in previous versions.

Part II of the guidance describes how to apply air quality models to generate results needed by the modeled tests for attainment. This includes developing a conceptual description of the problem to be addressed; developing a modeling/analysis protocol; selecting an appropriate model to support the demonstration; selecting appropriate meteorological episodes or time periods to model; choosing an appropriate area to model with appropriate horizontal/vertical resolution; generating meteorological and air quality inputs to the air quality model; generating emissions inputs to the air quality model; evaluating performance of the air quality model; and performing diagnostic tests. After these steps are completed, the model is used to simulate the effects of candidate control strategies.

Comment: Several commenters were supportive of the weight of evidence concept. They said that $PM_{2.5}$ modeling is inherently more uncertain than previous ozone modeling and the modeling guidance should reflect that. One commenter noted that weight of evidence demonstrations should be ''unbiased'', meaning that States should use all relevant analyses and not only information that helps their case.

Response: The EPA agrees with these comments. The final modeling guidance recommends supplemental analyses (including weight of evidence) for all attainment demonstrations. All States should submit modeling, ambient data, and emissions analyses in addition to the primary modeling demonstration. A weight of evidence analysis is needed if the predicted future year $PM_{2.5}$ concentrations are slightly higher or slightly lower than the NAAQS.

We also agree that a weight of evidence demonstration should include all relevant information, including analyses which support attainment and those that do not. The idea of the analysis is to ''weigh'' the evidence, both good and bad. That cannot be fairly done if some evidence is not presented.

Comment: Several commenters suggested that a modeled attainment demonstration should not be specifically required. Instead they suggest that all demonstrations should be weight of evidence demonstrations. This would include different analyses of ambient data, trends, and modeling. But due to the uncertainties in the current $PM_{2.5}$ models and emissions data, modeling would be but one part of a broader weight of evidence approach.

Response: We disagree with this comment. Model results should be the primary analysis of an attainment demonstration. Regardless of current uncertainties in the $PM_{2.5}$ models and emissions, models are the only tool that can predict future concentrations of $PM_{2.5}$. The uncertainties in the model inputs and formulation should be taken into account when evaluating the results. We agree that a broad analysis of modeling, ambient data and emissions trends should be part of the attainment demonstration. This is reflected in the final modeling guidance.

4. Modeled Attainment Test

[Section III.F.4 of November 1, 2005 proposed rule (70 FR 66008)]

a. Background

The proposal described the nature of the attainment tests for the annual average and 24-hour average $PM_{2.5}$ NAAQS contained within the modeling guidance. Both tests use monitored data to estimate current air quality. The attainment test for a given standard is applied at each monitor location within or near a designated nonattainment area for that standard. There is also an additional attainment test to be performed in unmonitored areas. Models are used in a relative sense to estimate the response of measured air quality to future changes in emissions. Future air quality is estimated by multiplying current monitored values times modeled responses to changes in emissions. Because $PM_{2.5}$ is a mixture of chemical components, the guidance recommends using current observations and modeled responses of major components of $PM_{2.5}$ to estimate future concentrations of each component. The predicted future concentration of $PM_{2.5}$ is the sum of the predicted component concentrations.

b. Final Rule

The nature of the $PM_{2.5}$ attainment tests is unchanged. The final modeling guidance recommends refinements to the test and discusses the treatment of individual $PM_{2.5}$ species. The speciated modeled attainment test (SMAT) that was used to estimate future $PM_{2.5}$ concentrations for CAIR has been (mostly) implemented in the final guidance. Among the new recommendations is to better account for the known differences between the $PM_{2.5}$ Federal Reference Method (FRM) measurements and the $PM_{2.5}$ speciation measurements. For example, it is recommended to account for the volatilization of nitrate from the FRM filters and to account for uncertainties in organic carbon measurements by employing an ''organic carbon by mass balance'' technique. This assumes that all remaining mass not accounted for by other species is organic carbon mass. Additional details are contained in the modeling guidance.

The guidance also recommends, where necessary, to spatially interpolate $PM_{2.5}$ species data to estimate the species concentrations at FRM sites. It is necessary to estimate species concentrations when there are no species measurements at FRM sites. Several techniques can be used to estimate species concentrations. Spatial interpolation techniques may be useful in many areas. In other cases, it may be adequate to assume that data from a speciation monitor may be representative of multiple FRM monitors. It is particularly important to develop credible techniques to estimate species concentrations at the locations of the highest FRM monitors.

The guidance lists several techniques that can be used. The EPA will provide software which will apply the modeled attainment test, using ambient data and model outputs. Additionally, the software will interpolate the $PM_{2.5}$ species data to allow application of SMAT for all FRM monitors. The software will be available at the same location as the final modeling guidance (*http://www.epa.gov/scram001/guidance_sip.htm*).

Ultimately, it is up to the States to determine the best method to represent the $PM_{2.5}$ species concentrations, subject to EPA's review and approval. These estimates are needed to perform the modeled attainment test.

c. Comments and Responses

Comment: Several commenters were concerned that interpolation of $PM_{2.5}$ species concentrations may not be appropriate in certain areas or situations. The concentrations can vary significantly between urban and rural areas and even between nearby urban areas. One commenter suggested that it might be useful to use older field study measurements to derive current species concentrations. Another commenter suggested that it might be reasonable to assume that speciation measurements were representative of nearby FRM sites.

Response: We agree that interpolations of species data may not always be the best way to estimate species concentrations at FRM sites. The modeling guidance lists several different possible techniques. States should review their data and situation and choose the most reasonable methodology to estimate species concentrations. Nonattainment areas that don't have speciation measurements at the highest FRM site(s) need to be especially careful. The result of the speciated attainment test can be heavily influenced by the assumed species concentrations at the highest FRM sites. The attainment test will be more straightforward in areas with speciation monitors at the highest FRM sites. States are also encouraged to place speciation monitors at the highest FRM sites. This will aid in future assessments of attainment and ambient trends.

5. Multi-Pollutant Assessments

[Section III.F.5 of November 1, 2005 proposed rule (70 FR 66009)]

a. Background

The formation and transport of $PM_{2.5}$ is in many cases closely related to the formation of both regional haze and ozone. There is often a positive correlation between measured ozone and secondary particulate matter. Many of the same factors affecting concentrations of ozone also affect concentrations of secondary particulate matter. For example, similarities exist in sources of precursors for ozone and secondary particulate matter. Emissions of NO_X may lead to formation of nitrates as well as ozone. Sources of VOC may be sources or precursors for both ozone and organic particles. Presence of ozone itself may be an important factor affecting secondary particulate formation. The proposal recommended multi-pollutant assessments for $PM_{2.5}$ attainment demonstrations. A multi-pollutant assessment, or one-atmosphere modeling, is conducted with a single air quality model that is capable of simulating transport and formation of multiple pollutants simultaneously. This type of model simulates the formation and deposition of $PM_{2.5}$, ozone, and regional haze components, and it includes algorithms simulating gas phase chemistry, aqueous phase chemistry, aerosol formation, and acid deposition.

b. Final Rule

The recommendation to conduct multi-pollutant assessments remains unchanged. It is recommended to model the impacts of future year control strategies on $PM_{2.5}$, ozone, and regional haze. It may not always be possible or convenient to do so, but it can be beneficial to the strategy development process.

$PM_{2.5}$ control strategies will have an impact on regional haze, and will possibly impact ozone. Even if high ozone and high $PM_{2.5}$ concentrations don't typically occur during the same time of the year, controls that affect precursors to $PM_{2.5}$ may also affect ozone (e.g. NO_X). The SIP submittal dates for $PM_{2.5}$, ozone, and regional haze do not currently line up. The $PM_{2.5}$ SIPs are due almost 1 year later than ozone. But States can still do modeling analyses that can provide information for multiple pollutants. States can use one-atmosphere models that are capable of simulating both ozone and $PM_{2.5}$. They can also try to use consistent meteorological fields and emissions inventories so that the same control strategies are relatively easy to evaluate for both ozone and $PM_{2.5}$. Modeling the same future year(s) for $PM_{2.5}$ and ozone can also make it easier to evaluate the impacts of controls on both pollutants.

It should be noted that there are no specific modeling requirements other than the recommendation to try to harmonize the ozone, $PM_{2.5}$, and regional haze analyses whenever possible.

c. Comments and Responses

Comment: One commenter suggests that multi-pollutant assessments may not be beneficial because their area experiences winter $PM_{2.5}$ exceedances and summer ozone exceedances.

Response: We disagree with the comment. Even in situations where high $PM_{2.5}$ and ozone don't occur during the same time of year, multi-pollutant assessments may be helpful. NO_X controls that may be needed to reduce nitrates in the winter are likely to have an impact on ozone in the summer. As well, changes in VOCs may have an impact on both $PM_{2.5}$ and ozone. Running potential control strategies through the same modeling platform for ozone, $PM_{2.5}$, and regional haze may allow the development of optimized strategies.

6. Which Future Year(s) Should Be Modeled?

[Section III.F.6 of November 1, 2005 proposed rule (70 FR 66009)]

a. Background

Modeling analyses consist of base year modeling and future year modeling. The attainment test examines the change in air quality between the base and future years. The proposal recommended, where possible, future modeling years should be coordinated so that a single year can be used for both $PM_{2.5}$ and ozone modeling. This coordination will help to reduce resources expended for individual modeling applications for $PM_{2.5}$ and ozone and will facilitate simultaneous evaluation of ozone and PM impacts.

Although there is some flexibility in choosing the future year modeling time periods, unless the State believes it cannot attain the standards within 5 years of the date of designation and must request an attainment date extension, the choice of modeling years for $PM_{2.5}$ cannot go beyond the initial 5 attainment period. Attainment date extensions will only be granted under certain circumstances. Among other things, the State must submit an attainment demonstration showing that attainment within 5 years of the designation date is impracticable.

b. Final Rule

Further information is now known concerning the modeling years for ozone. Moderate nonattainment areas are presumed to be modeling 2009. This is consistent with the last year of the 5 year period allowed under Subpart I for $PM_{2.5}$. Therefore, it is logical to presume that areas that are able to attain the $PM_{2.5}$ NAAQS within 5 years will model a future year of 2009. Areas that won't be able to attain the standard in 5 years will need to request an attainment date extension (of up to 5 additional years).

The NAAQS must be attained as expeditiously as practicable. Therefore, attainment date extensions must contain modeling analyses to justify the extension. Details of the required analyses are contained in the RACT and RACM sections of the final rule. See section F for more details.

F. Reasonably Available Control Technology and Reasonably Available Control Measures

This section of the preamble discusses the final rule requirements for RACT and RACM. In order to explain EPA's

approach in the final rule more clearly, we first discuss the statutory and regulatory background for the RACT and RACM requirements, and we then explain the key options and interpretations upon which we took comment in the proposal. Thereafter, we discuss significant comments we received on the proposal and provide brief responses to those comments. [Additional comments and responses appear in the RTC for this final rule located in the docket.] Most of the comments received on this topic addressed the three options EPA proposed for the RACT requirement, the relationship between the RACT requirement and EPA's Clean Air Interstate Rule (CAIR), and the control measures to be required or considered for RACT and RACM.

1. Background on Statutory Requirements for RACT and RACM

Subpart 1 of Part D of the CAA (sections 171–179B) applies to all designated nonattainment areas. Section 172 of this subpart includes general requirements for all attainment plans.

Notably, Congress provided EPA and States a great deal of deference for determining what measures to include in an attainment plan. Specifically, Section 172(c)(1) requires that each attainment plan ''provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology), and shall provide for attainment of the national primary ambient air quality standards.'' By including language in Section 172(c)(1) that only ''reasonably available'' measures be considered for RACT/RACM, and that implementation of these measures need be applied only ''as expeditiously as practicable,'' Congress clearly intended that the RACT/RACM requirement be driven by an overall requirement that the measure be ''reasonable.'' Thus, the rule of ''reason'' drives the decisions on what controls to apply, what should be controlled, by when emissions must be reduced, and finally, the rigor required in a State's RACT/RACM analysis. For example, we previously stated that the Act ''does not require measures that are absurd, unenforceable, or impractical'' or result in ''severely disruptive socioeconomic impacts'' 55 FR 38327. Moreover, we interpret the term ''reasonably available'' to allow States to consider both the costs and benefits of applying the measure, and whether the measure can be readily and effectively implemented without undue administrative burden. 66 FR 26969.

We also interpret the ''reasonably available control measures'' in these provisions as referring to measures of any type that may be applicable to a wide range of sources, whereas the parenthetical reference to ''reasonably available control technology'' refers to measures applicable to stationary sources. RACM can apply to mobile sources, areas sources and stationary sources not already subject to $PM_{2.5}$ RACT requirements. Thus, RACT is a type of RACM specifically designed for stationary sources. As noted above, States are required to implement RACM and RACT ''as expeditiously as practicable'' as part of attainment plans designed to attain the standards.[20]

Section 172 does not include any specific applicability thresholds to identify the size of sources that States and EPA must consider in the RACT and RACM analysis. Nor, does Section 172 specifically indicate which pollutant(s) or precursor(s) must be subject to RACM or RACT measures to attain the NAAQS. Other pollutant-specific provisions of the CAA do include applicability thresholds pertaining to attainment plan requirements for NAAQS and precursor pollutants. For example, subpart 2 of part D, which establishes additional requirements for ozone nonattainment areas, establishes thresholds ranging from 100 to 10 tons per year for requirements applicable to ''major sources'' or ''major stationary sources,'' depending on the area's classification or level of nonattainment. Subpart 4 of part D, which provides additional plan requirements for PM_{10} nonattainment areas, establishes thresholds of 100 and 70 tons per year for requirements applicable to a ''major source'' or ''major stationary source.''

Moreover, subpart 1, unlike subparts 2 and 4, does not identify specific source categories for which EPA must issue control technology documents or guidelines, or identify specific source categories for State and EPA evaluation during attainment plan development. For ozone, subpart 2 contains a list of specific requirements for control techniques guidelines (CTGs) and alternative control techniques (ACT) documents. For PM_{10}, section 190 of the CAA (in subpart 4) places particular emphasis on specific sources of area emissions, but does not identify specific stationary source categories for which RACT guidance must be issued. Section 190 requires EPA to develop RACM guidance documents for residential wood combustion, silvacultural and agricultural burning, and for urban fugitive dust control.

2. What Is the Overall Approach To Implementing RACT and RACM in the Final Rule?

a. Background for RACT

Since the 1970s, EPA has interpreted RACT to mean ''the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility'' as well as other considerations.[21] Presumptive RACT has been described as the norm achievable by the source category.[22]

Section 110 of the 1970 Clean Air Act required States to develop SIPs providing for attainment of the NAAQS by 1975 or 1977. A number of areas were having difficulty with developing attainment plans, particularly for the ozone standard. In response to the implementation needs of this time period, EPA introduced the term ''RACT'' in a 1976 memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management to Regional Administrators, ''Guidance for Determining Acceptability of SIP Regulations in Non-attainment Areas'' (Dec. 9, 1976). In this early guidance relating to the acceptability of SIP regulations, we indicated that our overriding concern in approving SIPs was attaining the particular NAAQS as expeditiously as practicable through reasonably available control technology and other reasonably available control measures. ''The basis for fully approving state-submitted SIP regulations continues to be demonstrated attainment and maintenance of all national ambient air quality standards as expeditiously as practicable,'' the memo stated.

The 1977 Clean Air Act amendments added Part D to Title I of the Act, and for the first time the Act specifically called for EPA to designate nonattainment areas and for SIPs to require RACT and RACM in those nonattainment areas. In a 1979 **Federal**

[20] Under the Tribal Air Rule (TAR), requirements for RACT and RACM may be considered to be severable elements of implementation plan requirements for Tribes.

[21] See, 44 FR 53782, September 17, 1979, and 1976 memorandum from Roger Strelow, Assistant Administrator for Air and Waste Management to Regional Administrators, ''Guidance for Determining Acceptability of SIP Regulations in Non-attainment Areas'' (Dec. 9, 1976).

[22] See e.g. Workshop on Requirements for Non-attainment Area Plans—Compilation of Presentations (OAQPS No. 1.2–103, revised edition April 1978).

Register notice, EPA noted its view that Congress adopted EPA's pre-existing conception of RACT in the 1977 amendments. (44 FR 53782, September 17, 1979). Also during the late 1970s, EPA developed a number of new control techniques guideline (CTG) documents as directed in the 1977 amendments. These CTGs provided States with information on controls for a number of categories of sources emitting VOCs, and recommended a ''presumptive norm'' for State RACT determinations based on the control levels achievable by sources in a given industry. CTGs reduced the burden on States by eliminating the need for each State to develop its own technical support for implementing the RACT requirement. Since the CTG-recommended controls were based on general capabilities of an industry, EPA in the 1979 guidance (44 FR 53782) urged States in setting RACT to judge the feasibility of the recommended controls on particular sources, and to adjust accordingly.

As noted above, EPA's early guidance related to the RACT requirement indicated that our overriding concern in approving State RACT requirements was attaining the particular NAAQS. We initially required States to apply RACT to qualify for attainment extensions, and in some cases, for plans that could not demonstrate attainment.

During the 1980s, EPA implemented the RACT requirements with a number of CTGs and guidance documents. These materials were aimed at addressing the attainment deadlines of 1982 and 1987 under the 1977 Clean Air Act amendments. During this time, EPA, for pollutants other than ozone, considered RACT to be dependent upon reductions needed for attainment as expeditiously as practicable. For ozone, where the State performed photochemical grid modeling, the approach was the same, but where the State used less sophisticated tools, we considered RACT to be independent of whether the controls were needed to reach attainment as expeditiously as practicable. We took this alternate approach because of concerns related to the precision of modeling techniques. In other words, in those cases, we required that a stationary source of the requisite type and size be subject to RACT, whether or not such controls were actually demonstrated to be necessary for the area to attain by its specified date. (44 FR 20375–20376, April 4, 1979)

Congress followed a similar approach in the 1990 amendments to the CAA for purposes of the ozone NAAQS in the subpart 2 provisions added at that time. For example, section 182(b)(2) requires the imposition of RACT controls for all VOC source categories covered by a CTG and for all other major stationary sources of VOC located within certain nonattainment areas. Thus, Congress required these controls without allowing for an area-specific demonstration by the State that the area needed the controls for attainment as expeditiously as practicable. Extensive discussion of this requirement appeared in the 1992 general preamble (57 FR 13541), in which EPA provided guidance for implementation of the ozone NAAQS.

Notably, Congress did not significantly amend the generally applicable provisions for nonattainment areas that appear in subpart 1 of Part D in 1990. This indicates that Congress intended that the Agency retain the authority to interpret the generally applicable nonattainment area plan requirements of section 172(c), including the RACT and RACM requirements, in the way that is most appropriate for new NAAQS that are subject to subpart 1. As discussed below, EPA has determined that an approach to the RACT requirement in which RACT varies in different nonattainment areas based on the reductions needed for attainment as expeditiously as practicable, is appropriate for implementation of the $PM_{2.5}$ NAAQS. We believe that the improved ability to model air quality impacts of emissions controls allows for this approach.

b. Proposed Options for RACT

The EPA proposed and requested comment on three alternative approaches for interpretation of the RACT requirement of section 172(c)(1) for implementation of the $PM_{2.5}$ NAAQS. The EPA proposed these approaches in order to evaluate which method would best ensure that States consider and adopt RACT measures for stationary sources in a way that is consistent with the overarching requirement to attain the standards as expeditiously as practicable, while providing flexibility for States to focus regulatory resources on those sources of emissions that contribute most to local $PM_{2.5}$ nonattainment.

Under the first proposed alternative, EPA would require States to conduct a RACT analysis and to identify and require reasonably available controls for all affected stationary sources in the nonattainment area, comparable to the implementation of RACT provided in subpart 2 governing implementation of the 1-hour ozone NAAQS. Under this option, covered sources would be required to apply reasonable available controls considering technical and economic feasibility, and there would be no opportunity for States to excuse stationary sources from control on the basis that the emissions reductions from those controls would not be necessary to meet RFP requirements or to reach attainment. Under this alternative, EPA proposed to limit the universe of sources for which States must conduct a RACT analysis and impose RACT controls, by providing an applicability threshold based upon the amount of emissions potentially emitted by the sources. Under this first option, EPA requested comment on a number of alternative emissions applicability thresholds.

Under the second proposed alternative, EPA would require States to conduct a RACT analysis and to identify reasonably available controls for all affected stationary sources. Under this option, however, States could thereafter determine that RACT does not include controls that would not otherwise be necessary to meet RFP requirements or to attain the $PM_{2.5}$ NAAQS as expeditiously as practicable.[23] Under this approach, RACT would be determined as part of the broader RACM analysis and identification of all measures—for stationary, mobile, and area sources—that are technically and economically feasible, and that would collectively contribute to advancing the attainment date.[24] Because RACT and RACM are considered together under this alternative, we did not propose emissions threshold options for evaluation of stationary source RACT. In addition, consistent with existing policies, States would be required to evaluate the combined effect of reasonably available measures to determine whether application of such measures could advance the attainment date by at least one year.[25]

The third proposed alternative, EPA's preferred option in the proposal, combined the first two options and is similar to the RACT approach adopted in the final implementation rule for the 8-hour ozone program. Under the third option, EPA would require States to conduct a RACT analysis and to require reasonably available controls for all affected stationary sources in

[23] Under the Tribal Air Rule (TAR), requirements for RACT and RACM may be considered to be severable elements of implementation plan requirements for Tribes.

[24] In *Sierra Club* v. *EPA*, 294 F.3d 155 (D.C. Cir. 2002), the court stated in upholding EPA's statutory interpretation of RACM that the Act does not compel a state to consider a measure without regard to whether it would expedite attainment.

[25] In this notice, where we use the shorthand phrase ''advance the attainment date,'' it means ''advance the attainment date by one year or more.''

nonattainment areas with attainment dates more than 5 years from the date of designation. For areas with an attainment date within 5 years of designation (e.g. by April 5, 2010 for areas with an effective date for designation of April 5, 2005), EPA would require RACT as under the second proposed alternative, in which RACT would be determined as part of the broader RACM analysis. For these areas, States could determine that RACT does not include controls that would not otherwise be necessary to meet RFP requirements or to attain the $PM_{2.5}$ NAAQS as expeditiously as practicable. The same proposed suboptions with respect to the size of sources for consideration under the first alternative were also included under this alternative.

c. Proposed Approach for RACM

The EPA proposed and asked for comment on one approach for interpreting the RACM requirement for $PM_{2.5}$. The EPA based the proposal on the approach that we adopted for other NAAQS implementation programs. Under this approach, a State provides a demonstration in its SIP that it adopted all reasonably available measures needed to meet RFP requirements and to attain the standard as expeditiously as practicable and that no reasonably available additional measures would advance the advance the attainment date by at least 1 year or would be necessary to meet the RFP requirement for the area.[26]

Under section 172(a)(2), the state implementation plan must provide for a nonattainment area to attain as expeditiously as practicable, but no later than 5 years after the effective date of designation of the area (e.g., no later than April 2010 for the final designations effective April 2005). The statute thus creates a presumption for attainment within 5 years of designation unless certain statutory criteria are met for an extension of the attainment date. Under the proposed approach to RACM for $PM_{2.5}$, each State would evaluate available measures for sources of $PM_{2.5}$ or its regulatory precursors in the area to determine if reasonable measures were needed to meet the RFP requirement or to achieve attainment as expeditiously as practicable. If modeling of all RACM and other state, regional and federal measures indicates that the State will not be able to demonstrate attainment within 5 years after designation based upon the severity of nonattainment in that area or the availability or feasibility of implementing controls in that area, then the State may request an attainment date extension. We proposed that under these circumstances, the EPA could extend the attainment date for a period of 1 to 5 years, when the State shows that it will implement all RACT and RACM as expeditiously as practicable, has met its obligation to address intrastate pollution transport from sources within its jurisdiction, and still needs additional time to attain.

In the proposed rule, the EPA also took comment on the following overall steps for implementing the statutory requirement for RACM.

(1) *Identification of measures.* The State would begin the process of determining RACM by identifying all available control measures for all sources of $PM_{2.5}$ and its precursors in the nonattainment area. The RACM can apply to mobile sources, area sources, and stationary sources.

(2) *Evaluation of measures.* After the State identifies the universe of available measures for the sources in the area, the State would evaluate them to determine whether implementation of such measures is technically and economically feasible, and whether the measure will contribute to advancing the attainment date.

(3) *Adoption of measures.* The State would adopt all reasonably available measures for the area consistent with meeting the applicable RFP requirements and attaining the NAAQS as expeditiously as practicable, in accordance with applicable policy and guidance for attainment demonstrations. We would then approve or disapprove the State's plan through notice and comment rulemaking. We also noted that in reviewing the State's selection of measures for RACM, or determining that certain measures are not RACM, EPA may independently supplement the rationale of the State or provide an alternative reason for reaching the same conclusion as the State.

c. Final Rule

The EPA carefully considered our interpretation of section 172(c)(1) for the $PM_{2.5}$ NAAQS. Because of the variable nature of the $PM_{2.5}$ problem in different nonattainment areas, which may require States to develop attainment plans that address widely disparate circumstances (e.g., different source types and mixes, different precursors and mixes of precursors, and different meteorological conditions), we determined that the regulations implementing the $PM_{2.5}$ NAAQS should provide for a great degree of flexibility with respect to the RACT and RACM controls.

Selected approach to RACT and RACM. The final rule reflects EPA's decision to select option 2 for RACT and to require a combined approach to RACT and RACM. Under this approach, RACT and RACM are those measures that a State finds are both reasonably available and contribute to attainment as expeditiously as practical in the specific nonattainment area.

By definition, measures that are not necessary either to meet the RFP requirement, or to help the area attain the NAAQS as expeditiously as practicable, are not required RACT or RACM for such area. The EPA believes that this approach provides the greatest flexibility to a State to tailor its SIP control strategy to the needs of a particular $PM_{2.5}$ nonattainment area, but it may require the State to conduct a more detailed analysis to identify the most effective RACT/RACM strategy to attain the NAAQS.

During the comment period, commenters raised concerns that this approach may be overly burdensome on States because of the number of potential control measures a State would need to consider. Today, we clarify that although the State must conduct a thorough analysis of reasonably available measures, States need not analyze every conceivable measure, as explained in the guidance below. Instead, ''reason'' should drive States identification of potential measures, but States should remain mindful of the public health risks of $PM_{2.5}$. As long as a State's analysis is sufficiently robust in considering potential measures to ensure selection of all appropriate RACT and RACM, and the State provides a reasoned justification for its analytical approach, we will consider approving that State's RACT/RACM strategy.

Guidance on State analysis to identify RACT, RACM and appropriate attainment date. A State must consider RACT and RACM for all of its nonattainment areas. However, EPA believes that if the State projects that an area will attain the standard within 5 years of designation as a result of existing national measures (i.e. projected to have a design value of 14.5 or lower), then the State may conduct a limited RACT and RACM analysis that does not involve additional air quality modeling. A limited analysis of this type would involve the review of reasonably available measures, the estimation of potential emissions

[26] In the context of the PM_{10} NAAQS, EPA has concluded that ''advancement of the attainment date'' should mean an advancement of at least one calendar year. *See* State Implementation Plans; General Preamble for the Implementation of Title I of the CAA Amendments of 1990, 57 FR 12498 (April 16, 1992). *See also Sierra Club* v. *EPA,* 294 F.3d 155 (D.C. Cir. 2002).

reductions, and the evaluation of the time needed to implement these measures. If the State could not achieve significant emissions reductions during 2008 due to time needed to implement the potential measures or other relevant factors, then the State and EPA could conclude that there are no further reasonably available control measures for that area that would advance the attainment date by one year or more relative to the presumptive outer limit for attainment dates, i.e., 5 years from designation. In lieu of conducting air quality modeling to assess the impact of potential RACT and RACM measures, States may consider existing modeling information to determine the magnitude of emissions reductions that could significantly affect air quality and potentially result in attaining prior to 2010 (e.g. in 2009 based on 2006–8 air quality data). If the State, in consultation with EPA, determines from this initial, limited RACT and RACM analysis that the area may be able to advance its attainment date through implementation of reasonable measures, then the State would conduct a more detailed RACT and RACM analysis, including appropriate air quality modeling analyses, to assess whether it can advance the attainment date.

In general, the combined approach to RACT and RACM in the final rule includes the following steps: (1) Identification of potential measures that are reasonable; (2) modeling to identify the attainment date that is as expeditious as practicable; and (3) selection of RACT and RACM.

Identification of potential measures. The State's review of potential measures must be sufficient to identify all appropriate RACT and RACM. As stated previously, inherent to RACT/RACM is the basic requirement that the measure be ''reasonable.'' A State need not evaluate measures in its RACM/RACT analysis that it determines are unreasonable such as measures that are ''absurd, unenforceable, or impractical'' or that would cause ''severely disruptive socioeconomic impacts, (e.g. gas rationing and mandatory source shutdowns); such measures are not required by the Act. 55 FR 38327.

As we also stated earlier, a State's RACT/RACM analysis not only involves an assessment about what emissions sources to control and to what level, but also a judgment as to when it is reasonable to require a sector to comply with a given measure. Accordingly, if the State or Federal rules already heavily regulate a given sector, it is reasonable for the State to first look to unregulated parts of the sector for RACT/RACM measures, especially, in light of costs already realized by the regulated sector. A State may conclude that it is unreasonable to further regulate the industry, or that it is only reasonable to impose measures in the latter years of the attainment plan.

Finally, the State should use reason in the extent of its efforts to identify potential control measures. For example, if a review of monitoring data and modeling studies indicates that reductions in SO_2 are much more effective in reducing ambient $PM_{2.5}$ than reductions in other pollutants, we expect that the State will more vigorously identify RACT/RACM measures for SO_2 than for other pollutants. Conversely, if reductions in a given pollutant, even in large quantities, would have trivial impacts on $PM_{2.5}$, less rigor is needed in the State's assessment of controls for that pollutant, because such controls could not contribute to advancing the attainment date. Likewise, where reducing emissions of a pollutant is effective in reducing ambient $PM_{2.5}$, if the emissions inventory for that pollutant is dominated by a given type of emissions source, then it would be appropriate to focus the analysis on measures for that segment of the inventory. No RACT/RACM analysis is needed for pollutants that are not attainment plan precursors for a particular $PM_{2.5}$ nonattainment area.

As supporting information for identification of RACT and RACM, the State ordinarily provides data on technologically feasible control measures:

—A list of all emissions source categories, sources and activities in the nonattainment area (for multi-State nonattainment areas, this would include source categories, sources and activities from all states which make up the area)

—For each source category, source, or activity, an inventory of direct $PM_{2.5}$ and precursor emissions;

—For each source category, source, or activity, a list of technologically feasible emission control technologies and/or measures [27]

—For each technologically feasible emission control technology or measure, the State should provide the following information: (1) The control efficiency by pollutant; (2) the possible emission reductions by pollutant; (3) the estimated cost per ton of pollutant reduced; and (4) the date by which the technology or measure could be reasonably implemented.

Based on this and other relevant information, the State will identify the reasonable measures (potential RACT and RACM) to be included in air quality modeling. (At its option, the State may prefer not to make a judgment on whether certain measures are technically and economically feasible, if it believes they will not contribute to earlier attainment. In that case, the State could include those measures in the modeling, and later exclude them from RACT and RACM by showing that all the excluded measures together would not advance the attainment date by at least 1 year.) As previously mentioned, in determining the attainment date that is as expeditious as practicable, the State should consider impacts on the nonattainment area of intrastate transport of pollution from sources within its jurisdiction, and potential reasonable measures to reduce emissions from those sources.

Modeling to determine the attainment date that is as expeditious as practicable. Second, for purposes of determining the attainment date that is as expeditious as practicable, the State will need to conduct modeling to show the combined air quality impact of all of the potential measures identified in the first step with a modeling analysis for the year 2009. A base case scenario for the year 2009 would project future air quality given implementation of existing measures (Federal, State and local). If this base case scenario demonstrates attainment by 2010, then the State must demonstrate why attainment could not be achieved in an earlier year. (As noted above, given the April 2008 due date for SIP submissions, it may be difficult to achieve earlier attainment in many cases).

If the base case scenario does not demonstrate attainment, then a control case scenario (described below) is needed to examine whether the reasonable, technically and economically feasible measures identified by the State would result in attainment in 2009. The control case scenario would add potential SIP measures—e.g. potential RACT/RACM, plus any candidate intrastate transport measures that the State has identified

[27] The EPA believes that it is not necessary to identify every possible variation of every type of control measure, or all possible combinations of technologies and measures that would apply to a given source or activity if the State has properly characterized the potentially available emissions reductions and their costs. For example, EPA believes that the State can conduct a thorough analysis of VMT reduction measures without including every possible level or stringency of implementation of certain possible measures or combinations of measures for reducing VMT, so long as those measures would not affect the overall assessment of VMT reduction capabilities and the associated costs.

and would be feasible to implement by that year. States in multi-State nonattainment areas are strongly encouraged to collaborate on their modeling analyses. This modeling, along with other information known as weight of evidence considerations, would inform a judgment as to whether reasonable measures could lead to attainment of the standards within 5 years after designation. If the analysis does not demonstrate attainment by April 2010 (2009 analysis year), then the analysis would serve as the technical basis for the State to seek an extension of the attainment date for that area. Further analysis would then be necessary and is required to identify the specific attainment date.

The choice of future years to model beyond 2010 may vary from area to area. Often, modeling potential controls in two different future years may be necessary to support a judgment that a projected attainment year is as expeditious as practicable. If the area is projected to remain over the standard in the early projection year (e.g., 2009) despite the emission reductions from the modeled control measures, but is projected to be well below the standard in the later projection year (e.g., 2012), interpolation and emission inventory analysis could identify an intermediate year as the appropriate attainment date. There may be cases in which modeling a single year is sufficient because modeling of all technically and economically feasible controls results in attainment by a narrow margin in that year.

For many areas, EPA modeling analysis for CAIR and other modeling analyses that have been performed suggest a number of nonattainment areas will have a modest amount (in some cases only a few tenths of a microgram) of needed reductions in ambient levels after 2010 to reach attainment. For any such area, and for areas otherwise expected to attain relatively soon after 2010 (for example, due to substantial reductions in a dominant local source), EPA believes that this analysis should be for a year no later than 2012. A later date (e.g., 2014) may be appropriate for areas with very high $PM_{2.5}$ levels that face difficulty attaining within 10 years.

The EPA believes that it is not reasonable to require States to model each and every year between 2009 and 2014 to determine the appropriate attainment date. Modeling future year inventories is a time consuming and resource intensive process. Multiple models and pre-processors are needed in order to generate year specific emissions for the various emissions sectors (e.g. mobile, non-road, non-EGU point, EGU point, etc.). Because it is not reasonable to model every year, a logical choice often may be to model a year in the middle of the period. As such, we recommend modeling an emissions year no later than 2012 as the initial extension date (which translates to a 2013 attainment date). If this modeling indicates that the area can reach attainment by 2012, then the State can further analyze emissions and strategies to determine if the attainment date can be advanced to an earlier year. If the modeling indicates that the area cannot reach attainment by 2012, then the modeling will serve as further justification for granting a longer attainment date extension (e.g., attainment date of 2015 with modeling for 2014). In that case, additional modeling of 2014 with further emissions controls would be required in order to show attainment. Again, the State should then further analyze emissions and strategies to determine if the attainment date can be advanced to an earlier year between 2012 and 2015.

Additionally, in the discussion of air quality modeling issues in section II.E above, we discuss the benefits of addressing control strategies for multiple pollutants. Part of the challenge of multi-pollutant modeling is coordinating the future modeling years for different pollutants in order to minimize the number of required future year model runs. As part of the requirements of the 8-hour ozone implementation rule, States are currently working on modeling analyses for 2009 and in some cases for 2012 (serious nonattainment areas). For an area that cannot attain the $PM_{2.5}$ NAAQS by 2010, this may be reason to select 2012 as the year to model, so that the State could conduct the modeling for both ozone and $PM_{2.5}$ in tandem. This would, in some cases, allow the pooling of resources (e.g., inventories, model runs, etc.) and provide for faster development of a $PM_{2.5}$ attainment demonstration.

It may also be possible for the State to look at 2009 and 2014 only. In this instance, the State may find sufficient data to interpolate results for the years in between based on estimated changes in emissions.

We emphasize that when a State models later years, that this analysis must take into account potential controls that the State may have determined would not be RACT or RACM for an earlier year. For example, some measures that are impractical to implement by 2009 could be reasonable if implemented by 2010, 2011 or 2012. Thus, when the State models later years, the list of potential controls should be expanded to include technically and economically feasible measures that can be implemented by the analysis year.

Selection of RACT & RACM. Based on this analysis, the State should make decisions on RACT, RACM, intrastate measures, and the attainment date that is as expeditious as practicable. Because EPA is defining RACT and RACM as only those reasonable, technically and economically feasible measures that are necessary for attainment as expeditiously as practicable, the State need not adopt all feasible, reasonable measures. The State may exclude those reasonable measures that, considered collectively, would not advance the attainment date.

Comments and Responses

Comment: A number of commenters generally supported EPA's second proposed alternative to RACT (option 2). Most of these commenters expressed concern that the other options would require the imposition of controls whether or not they were needed to attain the $PM_{2.5}$ standards as expeditiously as practicable. Some State and local commenters also urged EPA to select option 2 as the best interpretation of the RACT requirement for $PM_{2.5}$ because they believe that it will be the most appropriate approach for designing attainment strategies for their particular nonattainment area or areas.

Response: The EPA agrees that these two points are important considerations. After carefully considering the options, we concluded that Option 2 was the most suitable approach for the $PM_{2.5}$ NAAQS. Options 1 and 3 do not reduce the States' burden to analyze potential control measures as the States would still be required to look beyond the mandated RACT for reasonably available control measures (RACM). Moreover, Options 1 and 3 could require imposition of controls on some sources that would not strictly be necessary to attain the NAAQS as expeditiously as practicable. Given the nature of the $PM_{2.5}$ nonattainment problem, EPA concluded that an interpretation that provides the maximum flexibility is a better approach.

Comment: Some commenters recommended that EPA modify proposed option 2 to include a tons-per-year threshold. Under such an approach, the States and EPA would only require RACT for sources whose emissions were above the threshold. Most of these comments recommended a RACT threshold of 100 tons per year. These commenters expressed concern that if option 2 were implemented

without such a threshold, States would be burdened with conducting RACT analyses for very small sources or source categories with low emissions.

Response: The EPA believes that under the approach chosen for the final rule in which RACT is considered to be a part of the overall RACM process, it would be difficult to define a threshold that would apply for all types of sources and for all types of control measures in all nonattainment areas. It has not been common practice under past EPA policy to establish or use an emissions threshold when considering sources for possible emission reductions as part of a RACM analysis to show attainment as expeditiously as practicable. Indeed, many of the control technique guidelines for VOC RACT do not recommend an emissions threshold. A state needing significant emission reductions to attain the standards in a given area even by 2015 would likely conclude that controls should be considered on smaller sources. In contrast, a State with an area that exceeds the standard by only a few tenths of a microgram per cubic meter may not need to consider controls on smaller source to reach attainment as expeditiously as practicable. The EPA has selected option 2 for interpretation of the RACT requirement for $PM_{2.5}$, in part, specifically because that approach contemplates that States will conduct an appropriate analysis of the spectrum of source categories and potential controls available. To cut off such analysis at a set emissions-based cut point for all sources and all areas would undermine one of the key benefits of the approach. Accordingly, EPA disagrees with comments that option 2 should include a nationally-defined threshold for the size of sources or source categories that require RACT analyses.

Comment: A number of commenters supported EPA's first and third proposed alternative approaches to RACT (option 1 and option 3). Commenters supporting these two options used similar reasoning. Commenters cited the statutory language in section 172(c)(1) requiring that the attainment plan provide for ''at a minimum'' the adoption of RACT. Accordingly, these commenters argued that RACT is an independent, minimum requirement of attainment plans irrespective of the attainment demonstration and that option 2, which would not require the adoption of RACT for all sources, has no policy or legal justification. Other commenters noted that option 1 would be much easier to implement, because RACT would be defined according to technical reasonableness and would not hinge on complicated determinations involving attainment demonstrations. Some commenters argued that option 1 provides for greater equity, because similar measures would be required for similar sources for all nonattainment areas. Finally, some commenters believed that it is inherently inconsistent to assert that plans have met the requirement for attainment ''as expeditiously as practicable'' without applying RACT to all major sources.

Response: The EPA disagrees with these comments. The EPA believes that option 2 is fully consistent with section 172(c)(1). Section 172(c)(1) requires that attainment plans must provide for the implementation of RACM as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of RACT). Contrary to the commenters' assertions, this language does not demonstrate that RACT is required for all sources, independent of RACM and attainment demonstrations. Moreover, this provision does not require RACT whether or not imposition of technology would advance the attainment date. Instead, section 172(c)(1) explicitly provides that RACT is included within the definition of RACM, and EPA has previously determined that the CAA only requires such RACM as will provide for attainment as expeditiously as practicable. (See 57 FR 13498, 13560). The courts have deferred to this interpretation and concluded that EPA interprets RACM as a collection of reasonable measures that would advance the attainment date. See *Sierra Club* v. *EPA*, 294 F.3d 155, 162 (D.C. Cir. 2002); see also *Sierra Club* v. *EPA*, 314 F.3d 735, 744 (5th Cir. 2002). The CAA does not ''compel [ ] a State to consider whether any measure is 'reasonably available' without regard to whether it would expedite attainment in the relevant area.'' *Sierra Club* v. *EPA*, 294 F.3d at 162. The EPA concludes that because section 172(c)(1) establishes that RACT is a part of RACM, EPA is reasonably applying the same interpretation to the RACT requirement for $PM_{2.5}$. The RACT is a part of the collection of measures that are necessary to reach attainment as expeditiously as practicable. It is thus directly related to what a specific area needs to attain the NAAQS, and States need not implement reasonably available measures that would not advance the attainment date as part of the $PM_{2.5}$ RACT requirement.

The EPA also finds that option 2 is consistent with the statutory language providing that a State must apply RACT to existing sources, ''at a minimum,'' to meet its requirement to apply RACM. We interpret the ''at a minimum'' clause to mean that when a State determines that control of a specified existing stationary source(s) is necessary to attain, the State must apply RACT to that source. Further, EPA believes this requirement for RACT applies to stationary sources as a group, and not to each stationary source.

The EPA finds sound policy reasons for choosing option 2. While an approach that provided for application of the same controls in all areas would provide for more equity across areas, EPA emphasizes that equity is only one of many factors considered by EPA when deciding between options 1, 2 and 3. The EPA believes that it is also important to ensure that control strategies focus on the most effective measures with the greatest possibility for significant air quality improvements. In addition, while EPA agrees that options 1 and 3 could provide for greater ease of implementation, this is also only one of the factors EPA considered when deciding between the proposed options. Under option 2, States have a greater burden and responsibility to identify the local strategy that is tailored to their particular air quality problem. At the same time, the States have the ability to identify the sources with the greatest impact on nonattainment and to identify a sound strategy that achieves attainment in the most sensible manner. The EPA believes that approaching RACT and RACM in this manner is consistent with the overall philosophy imbedded in the SIP program since its inception in the late 1960s and early 1970s.

Comment: Some commenters believed that the proposed RACM requirement was too broad. These commenters believed that the requirement to analyze the entire ''universe'' of possible measures was too burdensome for States. Commenters felt this was especially true in light of the lack of federally issued CTG and ACT documents for $PM_{2.5}$ and its precursors for all potential source categories.

Response: As explained earlier, States should apply ''reason'' in identifying measures to evaluate as potential RACM/RACT. We recognize that States are implementing the $PM_{2.5}$ standard for the first time, and do not have the long history and experience in implementing $PM_{2.5}$ as they have in implementing the PM_{10} and ozone standards. Accordingly, we expect that both the States and EPA will expend extra effort in developing and evaluating attainment plans that contain appropriate controls. A number

of resources exist to provide States with information on potential control measure costs and emissions reductions. We intend to facilitate the sharing of information through a control measure website and other efforts, and expect that States will develop screening methods to reduce the burden of analysis.

Comment: One commenter asserted that EPA should not require the analysis for, or implementation of, RACT and RACM for sources throughout the entire nonattainment area, and should permit States to focus only on sources located in smaller specific ''problem areas'' within the nonattainment area.

Response: The EPA designated areas nonattainment based upon analysis of the geographic area with sources that ''contribute'' to the violation of the NAAQS in the area, in accordance with section 107(d). These designations are based upon, among other things, a network of monitors that the State and EPA previously agreed represented the ambient air concentrations throughout the area. Additional analysis of information during the designation process indicated those areas that contributed to the violations at the violating monitor because of, among other things, the amount of emissions in such adjoining areas. Accordingly, the State in which a nonattainment area is located must evaluate the full range of sources of $PM_{2.5}$ and its precursors throughout the designated nonattainment area during the development of the SIP. The EPA agrees that there are some nonattainment areas where one or a few large emissions sources may be causing localized concentrations at a monitor that are much higher than those within the remainder of the nonattainment area. For such areas, the nonattainment strategy will likely not succeed without addressing those sources. The EPA does not, however, believe it is acceptable that the nonattainment strategy focus only on those sources, because additional reductions within the nonattainment area would still have the potential to advance the attainment date. Exempting portions of the nonattainment area could expose a portion of the public residing downwind in the area to exposure to levels of $PM_{2.5}$ that exceed the NAAQS for longer than necessary, and the health detriments from such exposure, merely to minimize the impact of having to impose control strategies on sources upwind. Moreover, to the extent that monitoring in one portion of a nonattainment area indicates violations in multiple portions of the area, a strategy that solely focused upon the sources in the immediate vicinity of the monitor might fail to assure that the NAAQS is achieved throughout the area. Because NAAQS violations generally reflect a combination of regional scale, metropolitan scale, and local scale impacts, and all three scales must be addressed, EPA requires RACT/RACM submittals to address sources throughout the nonattainment area.

Comment: Some commenters agreed with EPA's view that State's RACM analysis must address those measures that a State declines to adopt and must show whether the combined measures would cumulatively advance the attainment date by at least 1 year. One commenter questioned the legal basis for EPA's determination that the only controls necessary to attain the $PM_{2.5}$ NAAQS as expeditiously as practicable are those that would cumulatively advance an area's projected attainment date by at least one calendar year. The commenter suggested that control measures that would advance attainment by a smaller increment ''would meet the criteria endorsed in Sierra Club [Sierra Club v. EPA, 294 F.3d 155 (D.C. Cir 2002)] by 'expedit[ing] attainment in the relevant area.' ''

Response: The EPA has consistently interpreted RACM as a collection of measures that would advance the attainment date by at least 1 year, and the courts have determined that the statutory RACM requirement is ambiguous and deferred to EPA's interpretation of the requirement. See *Sierra Club* v. *EPA*, 314 F.3d 735, 744 (5th Cir. 2002); see also *Sierra Club* v. *EPA*, 294 F.3d, 155 162 (D.C. Cir. 2002). Contrary to the commenter's suggestion, the court in *Sierra Club* v. *EPA*, did not endorse specific criteria for identifying control measures that expedite attainment, but instead deferred to EPA's interpretation of an ambiguous statutory term. The courts deferred to EPA's interpretation after reviewing EPA's approval of State SIP submissions. The EPA conducts such reviews consistent with its determination that the CAA only requires such RACM as will provide for attainment as expeditiously as practicable, and its belief that it would be unreasonable to require implementation of measures that would not in fact advance attainment. See 57 FR 13498, 13560 (April 15, 1992); see also 44 FR 20372, 20374 (April 4, 1979). In considering whether a collection of measures would advance the attainment date of an area, EPA has previously interpreted the phrase ''advance the attainment date'' as meaning that the attainment date would be advanced by at least 1 year. See e.g., 66 FR 57160, 57182 (Nov. 14, 2001) (approval of Houston SIP); 66 FR 586 (Jan 3. 2001) (approval of DC area SIP). Further, EPA's use of a one-year increment in determining whether a collection of measures would advance the attainment date is reasonable and consistent with the fact that all areas will be designing attainment demonstrations for the annual $PM_{2.5}$ standard. Section 172(a)(2)(C) statute uses 1 year as the increment by which attainment date extensions can be granted. Thus, requiring evaluation of whether control measures would advance attainment by an increment of 1 year is a reasonable approach for the $PM_{2.5}$ NAAQS.

Comment: Some commenters recommended that EPA consider not requiring a RACM analysis for areas projected to attain the standards within 5 years of designation, i.e., by April 2010 for the areas currently designated nonattainment. One commenter suggested that practical considerations would make it impossible for any State projected to attain by 2010 to advance the attainment date by a year. This commenter noted that because measures to provide for attainment by 2010 must be implemented by the beginning of 2009, and SIPs are not submitted until April 2008, it would impossible to advance the implementation of measures by 1 year (that is, the beginning of 2008).

Response: The EPA generally agrees that given the time constraints it will be difficult for States with areas currently designated nonattainment to devise, adopt, and implement RACM measures to advance the attainment date before 2010. At the same time, however, we note that nothing precludes States from taking early action and we encourage States to take actions to reduce $PM_{2.5}$ concentrations where feasible even before the SIPs are submitted. RACM is required by the CAA and thus EPA cannot waive the requirement for the analysis. At the same time, EPA recognizes that a streamlined analysis may be appropriate given the short time periods involved.

3. Observations and Considerations in Determining RACT and RACM

a. Background

The preamble to the proposed rule included a discussion of general considerations for RACT (70 FR 66020 and 66021, latter part of section III.I.6) and RACM (70 FR 66028, section III.1.15). The preamble to the final rule retains this discussion with some modifications and restructuring to

reflect the combined approach to RACT and RACM

b. Final Rule

General considerations. Once the State has identified measures and technologies that are available for implementation in the nonattainment area, then it must evaluate those measures to determine whether implementation of such measures are reasonable, and would collectively advance attainment. Many of the factors that the State should take into consideration in determining whether a measure is ''reasonable'' are related to the measure's technical and economic feasibility. Since RACM applies to area and mobile sources as well as stationary sources, the State should consider other factors as well in conducting its RACM analysis. For example, in many cases obtaining emissions reductions from area and mobile sources is achieved not by adding control technology to a specific emissions source, but by reducing the level of activity of a fleet of vehicles or by modifying a type of commercial process. In these situations, the State should also consider local circumstances such as infrastructure, population, or workforce and the time needed to implement the measure in light of the attainment date.

The EPA believes that while areas projected to attain within 5 years of designation as a result of existing national measures should still be required to conduct a RACT and RACM analysis, such areas may be able to conduct a limited RACT and RACM analysis that does not involve additional air quality modeling. A limited analysis of this type could involve the review of available reasonable measures, the estimation of potential emissions reductions, and the evaluation of the time needed to implement these measures. If the State could not achieve significant emissions reductions by the beginning of 2008 due to time needed to implement reasonable measures or other factors, then it could be concluded that reasonably available local measures would not advance the attainment date. In lieu of conducting air quality modeling to assess the impact of potential RACT and RACM measures, existing modeling information could be considered in determining the magnitude of emissions reductions that could significantly affect air quality and potentially result in earlier attainment. If the State, in consultation with EPA, determines from this initial, more limited RACT and RACM analysis that the area may be able to advance its attainment date through implementation of reasonable measures, then the State would conduct a more detailed RACT and RACM analysis.

Observations on control opportunities. The implementation of the $PM_{2.5}$ NAAQS is in its initial stages, and many of the designated $PM_{2.5}$ nonattainment areas are not current or former PM_{10} nonattainment areas. Thus, some existing stationary sources in these areas may currently be uncontrolled or undercontrolled for $PM_{2.5}$ or $PM_{2.5}$ precursors. Further, to this point in time, emissions controls for existing sources in these areas may have focused primarily on particulate matter that is filterable at stack temperatures and thus may not adequately control condensable emissions. In addition, States should bear in mind that the controlled sources may have installed emission controls 15 years ago or more, and there may now be cost-effective opportunities available to reduce emissions further through more comprehensive and improved emissions control technologies, or through production process changes that are inherently lower in emissions.

Moreover, improved monitoring methods may enhance the ability of sources to maintain the effectiveness of installed emissions controls and to reduce emissions by detecting equipment failures more quickly. For example, State imposition of requirements for more frequent monitoring (e.g., continuous opacity monitors, PM continuous emissions monitors, etc.) may provide greater assurance of source compliance and quicker correction of inadvertent upset emissions conditions than existing approaches.

Even in former or current PM_{10} nonattainment areas, existing requirements for controlling direct PM emissions (e.g., with a baghouse or electrostatic precipitator) may not have been revised significantly since the 1970's. When EPA established the PM_{10} standards in 1987, we stated in the preamble that it was reasonable to assume that control technology that represented RACT and RACM for total suspended particulates (TSP) should satisfy the requirement for RACT and RACM for PM_{10}. 52 FR 24672 (July 1, 1987). The basis for EPA's belief was that controls for PM_{10} and TSP would both focus on reducing coarse particulate matter, and specifically that fraction of particulate matter that is solid (rather than gaseous or condensable) at typical stack temperatures. However, emission controls to capture coarse particles in some cases may be less effective in controlling $PM_{2.5}$. For this reason, there may be significant opportunities for sources to upgrade existing control technologies [28] and compliance monitoring methods to address direct PM emissions contributing to fine particulate matter levels with technologies that have advanced significantly over the past 15 years.

Precursor Controls. It will be important for States to conduct RACT and RACM determinations for stationary sources of $PM_{2.5}$ precursors as well as direct $PM_{2.5}$ emissions although, as noted above, the known atmospheric chemistry of the area may dictate the necessary rigor of this analysis. A significant fraction of $PM_{2.5}$ mass in most areas violating the standards is attributed to secondarily-formed components such as sulfate, nitrate, and some organic PM, and EPA believes that certain stationary sources of precursors of these components in nonattainment areas currently may be poorly controlled. Accordingly, to address these precursors, States should review existing sources for emission controls or process changes that could be reasonably implemented to reduce emissions from activities such as fuel combustion, industrial processes, and solvent usage.

Multi-State Nonattainment Areas. States in multi-State nonattainment areas will need to consult with each other on appropriate level of RACT and RACM for that area. We anticipate that States may decide upon RACT and RACM controls that differ from State to State, based upon the State's determination of the most effective strategies given the relevant mixture of sources and potential controls in the relevant nonattainment areas. So long as each State can adequately demonstrate that its chosen RACT and RACM approach will provide for meeting RFP requirements and for attainment of the NAAQS as expeditiously as practicable for the nonattainment area at issue, we anticipate approving plans that may elect to control a somewhat different mix of sources or to implement somewhat different controls as RACT and RACM. Nevertheless, States should consider RACT and RACM measures developed for other areas or other States. EPA may consider such measures in assessing the approvability of a State's SIP.

c. Comments and Responses

Comment: In the proposed rule, EPA indicated that States could consider the ''social acceptability'' of measures as a

[28] For example, see past EPA guidance on $PM_{2.5}$ control technologies: Stationary Source Control Techniques Document for Fine Particulate Matter (EPA–452/R–97–001), EPA Office of Air Quality Planning and Standards, October 1998.

factor in the determination of what constitutes RACM in a given area. A number of commenters recommended that EPA eliminate use of this factor. Some commenters questioned whether States or EPA had the legal authority to exclude measures from consideration based on social acceptability or popularity, if the measures are technically and economically available, and are needed to attain the NAAQS for protection of public health. Others expressed concerns that inclusion of such a factor would inevitably result in the elimination of controls for area and mobile sources and for this reason would unfairly focus emissions reduction strategies on industrial sources of $PM_{2.5}$ and precursors.

Response: The EPA believes that in developing RACM measures, it is important that States not rely unduly on measures that would be very difficult to enforce in practice. We discourage States from relying on measures that on paper may seem reasonably available but in practice might fail to achieve benefits due to the problems and costs of effectively enforcing these measures. However, we recognize that the CAA does not identify ''social acceptability'' as a factor in the definition of what may constitute RACT or RACM, and more generally the CAA does not establish a preference for measures that affect industrial sources instead of the general public and are therefore more likely to be ''socially acceptable.'' Therefore, given the concerns raised by commenters that establishment of ''social acceptability'' as a factor in the RACM analysis is without basis in the CAA and might result in inappropriate skewing of control strategies, we have removed this term from the final rule. We reiterate, however, that capability of effective implementation and enforcement are relevant considerations in the RACM analysis, even though public ''unpopularity'' is not. Moreover, in assessing the efficacy of measures and the credit they should be given in the context of attainment demonstrations or RFP calculations, EPA believes that such considerations are important.

4. What Factors Should States Consider in Determining Whether an Available Control Technology or Measure Is Technically Feasible?

a. Background

The following provides guidance for States to consider in determining whether an available control technology is technologically feasible.

b. Final Rule

The technological feasibility of applying an emission reduction method to a particular source should consider factors such as the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements. For example, the process, operating procedures, and raw materials used by a source can affect the feasibility of implementing process changes that reduce emissions and the selection of add-on emission control equipment. The operation and longevity of control equipment can be significantly influenced by the raw materials used and the process to which it is applied. The feasibility of modifying processes or applying control equipment also can be influenced by the physical layout of the particular plant. The space available in which to implement such changes may limit the choices and will also affect the costs of control.

Reducing air emissions may not justify adversely affecting other resources by increasing pollution in bodies of water, creating additional solid waste disposal problems or creating excessive energy demands. An otherwise available control technology may not be reasonable if these other environmental impacts cannot reasonably be mitigated. For analytic purposes, a State may consider a $PM_{2.5}$ control measure technologically infeasible if, considering the availability (and cost) of mitigating adverse impacts of that control on other pollution media, the control would not, in the State's reasoned judgment, provide a net benefit to public health and the environment. However, in many past situations, States and owners of existing sources have adopted $PM_{2.5}$ control technologies with known energy penalties and some adverse effects on other media, based on the reasoned judgment that installation of such technology would result in a net benefit to public health and the environment. States should consider this in determining technical feasibility. The costs of preventing adverse water, solid waste and energy impacts should be included in assessing the economic feasibility of the $PM_{2.5}$ control technology.

One particular cross-media issue relates to concentrated animal feeding operations (CAFOs). Should a State determine that reductions of direct $PM_{2.5}$ or $PM_{2.5}$ precursors from CAFOs are necessary for attainment in a nonattainment area, EPA strongly suggests that the State address these reductions from a cross-media perspective. Since 2003, EPA and many stakeholders have been interested in developing a framework to enable CAFOs to pursue superior environmental performance across all media. We are aware that today some CAFOs voluntarily conduct whole-farm audits to evaluate releases of pollutants to all media through Environmental Management Systems, self-assessment tools, performance track, ISO 14001 certification, and State-approved trade offs in meeting regulatory thresholds between air and water that accomplish the best overall level of environmental protection given State and local conditions. The EPA continues to believe the development of new and emerging technologies offers the potential to achieve equivalent or greater pollutant reductions than achieved solely by effluent guidelines and standards. Many of these are superior from a multimedia perspective, and EPA would like to encourage superior multimedia solutions. SIPs which need to address ammonia may provide a unique opportunity to encourage multimedia approaches at CAFOs. For example, the addition of animal by-products provides a valuable source of nutrients for crops, improves soil structure which enhances soil permeability, and adds valuable organic matter that improves soil health. However, inappropriate application can lead to air and water quality concerns or the improvement of one media at the cost of another. Optimal application technologies and rates reduce potential air and water quality standards violations. The EPA does not want to discourage approaches that are superior from a cross media perspective.

The EPA recommends that States evaluate alternative approaches to reducing emissions of particulate matter by reviewing existing EPA guidance [29] and other sources of control technology information. The EPA's 1998 guidance presents information on topics such as the design, operation and maintenance of general particulate matter control systems such as electrostatic precipitators, fabric filters, and wet scrubbers. The filterable particulate matter collection efficiency of each system is discussed as a function of particle size. The guidance document also provides information concerning

[29] Stationary Source Control Techniques Document for Fine Particulate Matter (EPA–452/R–97–001), EPA Office of Air Quality Planning and Standards, October 1998. See also: Controlling SO_2 Emissions: A Review of Technologies (EPA/600/R–00/093), EPA Office of Research and Development, November 2000.

other relevant considerations such as energy and environmental considerations, procedures for estimating costs of particulate matter control equipment, and evaluation of secondary environmental impacts. Because control technologies and monitoring approaches are constantly being improved, the State should also consider more updated or advanced technologies not referenced in this 1998 guidance when conducting a RACT determination. Emissions reductions may also be achieved through the application of monitoring and maintenance programs that use critical process and control parameters to verify that emission controls are operated and maintained so that they more continuously achieve the level of control that they were designed to achieve.[30]

c. Comments and Responses

Comment: One commenter noted that the guidance for ''technical feasibility'' implies that States look at individual sources with a BACT-like case-by-case analysis. The commenter recommended that source owners conduct such a site-specific analysis and submit the analysis to the State through the permitting process.

Response: While the analytical analysis to identify RACT is similar to BACT, as noted above, EPA in the past has issued CTGs that describe the presumptive norm for RACT controls for a given industry, but that allow for case-by-case considerations for a given source. Where States wished to require source owners to conduct such a site-specific analysis as part of the control technology review, EPA supports this type of process. On the other hand, EPA does not believe it would be appropriate to require all RACT-eligible sources to conduct such an analysis, given that States have the primary responsibility for identifying and analyzing measures for such sources.

5. What Factors Should States Consider in Determining Whether an Available Control Technology or Measure Is Economically Feasible?

a. Background

The follow provides guidance for States to consider in determining whether an available control technology is economically feasible for purposes of identifying reasonably available control measures. This guidance is slightly modified from our proposal.

b. Final Rule

Economic feasibility encompasses considerations such as whether the cost of a potential measure is reasonable considering attainment needs of the area and the costs of other measures, and whether the cost of a measure is reasonable for the regulated entity to bear, in light of benefits.

While many States generally establish RACT requirements for a category of sources, the Act does not require the same level of control on all sources in a category, nor does the Act require that each source be controlled individually. Similar sources may have different marginal costs, profit margins and abilities to pass costs through to the consumer. These factors are appropriate to consider in determining whether a given level of control is appropriate for an individual source or category of sources. Accordingly, there is no presumption that a given source must bear a cost similar to any other source.

States should consider the capital costs, annualized costs, cost effectiveness of an emissions reduction technology, and effects on the local economy in determining whether a potential control measure is reasonable for an area or State. One available reference for calculating costs is the EPA Air Pollution Control Cost Manual,[31] which describes the procedures EPA uses for determining these costs for stationary sources. The above costs should be determined for all technologically feasible emission reduction options if such measure is inherently ''reasonably available'' (e.g., not absurd or clearly impractical). States may give substantial weight to cost effectiveness in evaluating the economic feasibility of an emission reduction technology. The cost effectiveness of a technology is its annualized cost ($/year) divided by the emissions reduced (i.e., tons/year) which yields a cost per amount of emission reduction ($/ton). Cost effectiveness provides a value for each emission reduction option that is comparable with other options and other facilities. Where multiple control options exist for a given source or source category, States should consider both the cost effectiveness (dollars per ton) of each option, and the incremental cost effectiveness per ton between the options (incremental increase in cost between options divided by the incremental tons reduced).

In determining whether a given measure is reasonable, States may consider costs per ton of other measures previously employed to reduce that pollutant, but similar costs are not conclusive. As discussed above, States may evaluate equity considerations in weighing the economic feasibility of imposing a measure on a given source or source category.

We anticipate that States may decide upon RACT and RACM controls that differ from State to State, based on the State's determination of the most effective strategies given the relevant mixture of sources and potential controls in the relevant nonattainment areas, and differences in the difficulty of reaching attainment.

In considering what level of control is reasonable, EPA is not proposing a fixed dollar per ton cost threshold for RACT, consistent with the views of multiple commenters. Areas with more serious air quality problems typically will need to obtain greater levels of emissions reductions from local sources than areas with less serious problems. Where essential reductions are more difficult to achieve (e.g., because many sources are already controlled), the cost per ton of control may necessarily be higher.

It is not appropriate to assume that the same cost per ton range is reasonable for direct $PM_{2.5}$ and different precursors, because an equal amount of emission reduction in different pollutants has a different impact on $PM_{2.5}$ ambient levels. For example, in a given nonattainment area, reductions of direct $PM_{2.5}$ emissions may prove more expensive than reductions of NO_X emissions, but the resulting benefits of reductions of direct $PM_{2.5}$ might warrant the higher costs. A State should consider this differential impact on ambient $PM_{2.5}$ in considering RACT for controlling different pollutants. During the SIP process, States and regional planning organizations typically conduct sensitivity modeling that can provide this information. Also, the PM NAAQS RIA provides information on the differential impact of $PM_{2.5}$ and PM precursor reductions on ambient $PM_{2.5}$ levels in various areas.[32]

One of the factors that could affect estimated compliance costs of an emission reduction measure is the timing of its implementation. Hypothetically, if a short compliance period were contemplated for a set of sources, and if the short compliance

[30] See EPA's Web site for more information: *http://www.epa.gov/ttn/emc/monitor.html.*

[31] *EPA Air Pollution Control Cost Manual—Sixth Edition* (EPA 452/B–02–001), EPA Office of Air Quality Planning and Standards, Research Triangle Park, NC, Jan 2002.

[32] See: U.S. EPA 2006. *Regulatory Impact Analysis for the Particulate Matter National Ambient Air Quality Standards.* Air Benefits and Cost Group, Office of Air Quality Planning and Standards, Research Triangle Park, NC, October 6, 2006. Appendix A provides an analysis of estimated benefits and costs of attaining the 1997 PM NAAQS standards in 2015.

period resulted in high demand for a limited supply of labor or other resources, compliance costs could be higher than if the same measure were implemented by a later compliance date. In such a case it may be reasonable for the State to find that the measure is reasonable only if implemented by the later date.

If a source contends that a source-specific RACT level should be established because it cannot afford the technology that appears to be RACT for other sources in its source category, the source can support its claim with such information as:

—Fixed and variable production costs ($/unit)
—Product supply and demand elasticity,
—Product prices (cost absorption vs. cost pass-through),
—Expected costs incurred by competitors,
—Company profits once the technology or measure is in operation (considering the annualized costs and the marginal costs of alternative technologies and measures),
—Employment costs, and
—Any other unique factor(s) particular to the individual source.

Finally, the EPA clarifies that if the State demonstrates through economic analysis that the imposition of the measure would cause unacceptable economic disruption for the local economy, that is, a plant shutdown or a severe curtailment in plant employment or output, a State may reject the measure as not reasonable to reach attainment as expeditiously as practicable.

c. Comments and Responses

Comment: Some commenters agreed with EPA's proposal not to establish presumptive cost-effectiveness thresholds.

Response: The EPA agrees with the commenters.

Comment: A number of commenters expressed concerns over the references to health benefits as a consideration in whether measures are technically or economically available. Some commenters believed this is a consideration not authorized by the CAA. Others believed that consideration of benefits, in combination with EPA's estimates of benefits per ton, would have the effect of converting RACT to more stringent LAER levels. Some commenters expressed concerns whether States had the resources or expertise to conduct cost-benefit analyses for this purpose.

Response: The EPA wishes to clarify that the reference to health benefits does not mean that a cost-benefit, or a detailed health benefits assessment, is a necessary part of a control strategy demonstration. We also wish to clarify that EPA is not requiring that the costs of all technologies and measures for $PM_{2.5}$ and precursors be deemed acceptable at any dollar/ton levels at or below the calculated monetized benefits per ton of reduction. We do, however, continue to believe that the significant benefits associated with $PM_{2.5}$ ambient reductions is a relevant consideration in control strategy development. The EPA disagrees that this limited consideration of benefits would convert the RACT process to the equivalent of LAER.

Comment: One commenter objected to EPA's proposed requirement that States consider competitive factors such as production costs, demand elasticity, product prices, and cost incurred by competitors in the determination of RACT. The commenter believed that this information is generally not accessible to States or industrial facility owners, and is not necessary for a RACT determination.

Response: The EPA generally disagrees that this type of information is unavailable. For example, EPA calculates or reviews this type of data on a regular basis as part of our work on MACT, NSPS, and other emissions standards. A document that describes these types of analyses and the data used to prepare them is the OAQPS Economic Resource Manual found at *http://www.epa.gov/ttn/ecas/analguid.html.* EPA believes that this issue is most relevant to category-wide RACT rules where a source seeks a case-by-case exemption. Further, EPA believes most RACT determinations will be developed through case-by-case analyses rather than rules affecting entire source categories. Accordingly, this analysis likely will be relevant in few cases.

6. What Specific Source Categories and Control Measures Should a State Evaluate When Determining RACT and RACM for a Nonattainment Area?

a. Background

Section 172 does not provide a specific list of source categories and control measures that must be evaluated for RACT and RACM for $PM_{2.5}$. However, section 172(c)(3) indicates that the attainment plan must include a ''comprehensive, accurate, current, inventory of actual emissions from all sources of the relevant pollutant.'' This indicates that States should look broadly at the different types of sources in the nonattainment area. We recognize that $PM_{2.5}$ is a new NAAQS without a long history of implementation as with ozone. Therefore, we included a list of potential RACM measures in the preamble to the proposed rule, based upon a review of information about the contribution of various sources to emissions inventories and a review of potential control measures for such sources. We requested comment on the specific sources and potential control measures recommended for RACM analysis on this list. Based on comments received and additional information available to EPA since the proposal, we have made some changes to the list. We also refer to this list of potential ''RACT and RACM'' measures for the combined approach to RACT and RACM in the final rule.

In the preamble to the proposed rule, EPA indicated that due to the short time available, it does not plan to develop new control techniques guidance (CTG) or ACT documents specifically for purposes of $PM_{2.5}$ implementation. The EPA indicated that other information was available on control technologies, and EPA also indicated its intention to maintain an updated list of references for new $PM_{2.5}$ control technology information.

b. Final Rule

Emission reduction measures constituting RACM should be determined on an area-by-area basis. We believe that a State should consider each of the measures listed in this section to determine if each measure is reasonably available in the applicable nonattainment area. However, we do not presume that each of these measures is reasonably available in each nonattainment area.

We recommend that each State use the list of source categories in this section as a starting point for identifying potentially available control strategies (regulatory and voluntary) for a nonattainment area. States are encouraged and expected to add other potentially available measures to the list based on its knowledge of the particular universe of emissions sources in the area and comments from the general public. We expect that, depending on the potential measure being analyzed, the State's degree of evaluation will vary as appropriate. Detailed information on emission control technologies is available from a number of sources.[33] The EPA intends to maintain a website with links to sources of information for

[33] There are a number of sources of information on technologies for reducing emissions of $PM_{2.5}$ and its precursors. Links are provided to a number of national, state and local air quality agency sites from EPA's $PM_{2.5}$ Web site: *http://www.epa.gov/pm/measures.html.*

controlling emissions of direct particulate matter and PM precursors.

As discussed in section II.J.5. above, EPA recognizes that control technology guidance for certain source categories has not been updated for many years. Section 183(c) of the CAA, which addresses control technologies to address ozone nonattainment problems, requires EPA to ''revise and update such documents as the Administrator determines necessary.'' As new or updated information becomes available States should consider the new information in their RACT determinations. A State should consider the new information in any RACT determinations or certifications that have not been issued by the State as of the time such updated information becomes available.

Stationary Source Measures

—Stationary diesel engine retrofit, rebuild or replacement, with catalyzed particle filter

—New or upgraded emission control requirements for direct $PM_{2.5}$ emissions at stationary sources (e.g., installation or improved performance of control devices such as a baghouse or electrostatic precipitator; revised opacity standard; improved compliance monitoring methods)

—Improved capture of particulate emissions to increase the amount of $PM_{2.5}$ ducted to control devices, and to minimize the amount of $PM_{2.5}$ emitted to the atmosphere, for example, through roof monitors

—New or upgraded emission controls for $PM_{2.5}$ precursors at stationary sources (e.g., SO_2 controls such as wet or dry scrubbers, or reduced sulfur content in fuel; desulfurization of coke oven gas at coke ovens; improved sulfur recovery at refineries; increasing the recovery efficiency at sulfuric acid plants)

—Energy efficiency measures to reduce fuel consumption and associated pollutant emissions (either from local sources or distant power providers)

—Measures to reduce fugitive dust from industrial sites

Mobile Source Measures

—Onroad diesel engine retrofits for school buses,[34] trucks and transit buses using EPA-verified technologies

—Nonroad diesel engine retrofit, rebuild or replacement, with catalyzed particle filter [35]

—Diesel idling programs for trucks, locomotive, and other mobile sources [36]

—Transportation control measures (including those listed in section 108(f) of the CAA as well as other TCMs), as well as other transportation demand management and transportation systems management strategies [37]

—Programs to reduce emissions or accelerate retirement of high emitting vehicles, boats, and lawn and garden equipment

—Emissions testing and repair/maintenance programs for onroad vehicles

—Emissions testing and repair/maintenance programs for nonroad heavy-duty vehicles and equipment [38]

—Programs to expand use of clean burning fuels [39]

—Low emissions specifications for equipment or fuel used for large construction contracts, industrial facilities, ship yards, airports, and public or private vehicle fleets

—Opacity or other emissions standards for ''gross-emitting'' diesel equipment or vessels

Area Source Measures

—New open burning regulations and/or measures to improve program effectiveness such as programs to reduce or eliminate burning of land clearing vegetation

—Programs to reduce emissions from woodstoves and fireplaces including outreach programs, curtailments during days with expected high ambient levels of $PM_{2.5}$, and programs to encourage replacement of woodstoves when houses are sold

—Controls on emissions from charbroiling or other commercial cooking operations

—Reduced solvent usage or solvent substitution (particularly for organic compounds with 7 carbon atoms or more, such as toluene, xylene, and trimethyl benzene)

Category-Specific Guidelines on innovative approaches. The EPA has issued a number of category specific guidelines on approaches to taking into account innovative approaches to emissions reductions for purposes of SIPs. Categories currently covered by these guidelines include: (1) Electric-sector Energy Efficiency and Renewable Energy Measures; (2) Long Duration Switch Yard Locomotive Idling; (3) Long Duration Truck Idling; (4) Clean Diesel Combustion Technology; and (5) Commuter Choice Programs. See *http://www.epa.gov/ttn/airinnovations/measure_specific.html.*

c. Comments and Responses

Comment: Some commenters recommended that EPA provide new CTGs or other control technology review documents for purposes of assisting States to address $PM_{2.5}$ and its precursors, because the information in some current documents is out-dated.

Response: The EPA recognizes that issuance of new or updated CTGs specifically tailored for $PM_{2.5}$ would be useful. Unfortunately, limitations on time and resources preclude EPA from developing such CTGs in advance of the SIP submission date. The EPA cannot delay the statutorily specified outer date for SIP submission. However, EPA believes that there are already many sources of information and guidance on key source categories. To the extent that States need to examine potential control measures for sources never addressed before in any area or other context for a previous NAAQS, EPA anticipates that it will work closely with States during the process of plan development and approval to ensure an appropriate approach.

Comment: A number of commenters expressed concerns with references to the STAPPA and ALAPCO *Menu of Options* document. Some commenters believed that this document must be subject to formal review and comment to ensure appropriate stakeholder input.

Response: The language in the final preamble has been changed to refer to a Web site EPA maintains that provides access to a variety of information sources regarding control technologies that may be useful to States to consider in developing their $PM_{2.5}$ SIPs. These links include evaluations developed by government and nongovernment organizations. One such source with potentially useful information is the STAPPA and ALAPCO *Menu of Options.* However, EPA is not specifically endorsing any of the specific evaluations as being appropriate in any specific situation. Rather, we think documents such as the

[34] See Clean School Bus USA program at *http://www.epa.gov/cleanschoolbus/.* See also: ''What You Should Know About Diesel Exhaust and School Bus Idling,'' (June 2003, EPA420–F–03–021) at *http://www.epa.gov/otaq/retrofit/documents/f03021.pdf.*

[35] See EPA's voluntary diesel retrofit program Web site at *http://www.epa.gov/otaq/retrofit/overfleetowner.htm.*

[36] See EPA's voluntary diesel retrofit program Web site at *http://www.epa.gov/otaq/retrofit/idling.htm.*

[37] See EPA's Web site on transportation control measures at *http://www.epa.gov/otaq/transp/traqtcms.htm.*

[38] See EPA's Web site on nonroad engines, equipment, and vehicles at *http://www.epa.gov/otaq/nonroad.htm.*

[39] Fuels adopted in SIPs must be consistent with the Energy Policy Act of 2005 and EPA guidance on SIP-approved boutique fuels at 71 FR 78192 (December 28, 2006).

Menu of Options provide potentially useful ideas. Specifically, States would need to assess which items on the menu are applicable in their areas, and will have to assess the costs of applying controls locally. Accordingly, there would be ample opportunity for public review of the State's analysis of the local cost and air quality impacts of any measure listed in the document which is included in a State's SIP. The EPA is not requiring that States adhere to the list of measures in the *Menu of Options.* The EPA does not in any way mean to imply that the measures in the *Menu of Options* are presumed to be RACM, merely that they are potential controls for areas to consider. The *Menu of Options* has no regulatory significance and thus need not be issued through notice-and-comment rulemaking. The EPA notes, however, that the *Menu of Options* does provide a broad list of potential sources and measures that can help inform States in the development of their plans. Similarly, our own list of potential measures is not intended to be a categorical list of measures which States must adopt, rather it is intended to provide guidance about the types of sources and measures that States can consider in constructing their attainment plans. The EPA emphasizes that whether a source category or potential measure is or is not on this list is simply not conclusive as to whether a given measure is appropriate to consider in the RACT and RACM analysis. That can be determined only through the State's development of the attainment plan, and EPA's evaluation of such plan.

Comment: A commenter representing the paper industry interpreted the proposed rule as requiring electrostatic precipitator and tighter sulfur-in-fuel requirements for the forest products industry. The commenter believed that EPA was creating limits for such sources without adequate rulemaking process.

Response: The EPA disagrees that the listing of control technologies in the table in the rule creates a ''rebuttable presumption.'' Rather, the table identifies potential opportunities for emissions reductions which should be reviewed in light of technical and economic feasibility, and which a State should consider in a list of possible RACT and RACM measures for purposes of attaining the standards as expeditiously as practicable. The EPA is currently conducting a sector-based approach to the paper industry. One of the goals of the sector initiative on pulp and paper is to work with the industry to identify reductions in SO_2 and $PM_{2.5}$ that will assist us in meeting the NAAQS, considering facility locations, magnitude of emissions, emission stream characteristics, and cost effectiveness of controls.

Comment: A number of commenters believed that EPA should develop not only a list of measures to consider for RACM, but should develop a list of mandatory measures that States should include, particularly for areas with attainment dates more than 5 years after designation.

Response: See discussion in section II.D.3 regarding rule requirements for attainment date extensions and the issue of whether certain measures should be mandatory in order for an area to receive an extension.

Comment: Some commenters believed that the list of possible measures was deficient in not including sources of $PM_{2.5}$ and $PM_{2.5}$ precursors from agricultural sources. One commenter believed the list is incomplete without identifying the contribution of ammonia emissions associated with livestock, poultry, and crop fertilizers.

Response: As we indicated in the proposal, we included a list of potential RACM measures in the preamble to the proposed rule, based upon a review of information about the contribution of various sources to the emissions inventories and a review of potential control measures for such sources. We did not identify emissions from agricultural sources in this review. Because ammonia is not presumed to be a $PM_{2.5}$ precursor unless identified for a specific area by the State or EPA, regulation of ammonia emissions from agricultural sources may not be necessary.

We also note that the agricultural industry presents unique challenges to regulators given the nature of relevant emissions sources. Moreover, we currently lack good methods to quantify agricultural emissions, and we do not fully understand their contribution to nonattainment problems. We have entered into an agreement with several animal producer sectors to monitor animal feeding operations to develop better tools to assess emissions from this industry. Hopefully, these tools will enhance our knowledge of agricultural emissions and their contribution to nonattainment problems. Until emissions from these sources are better understood, States should be judicious in determining whether any specific measure is RACT/RACM for this industry.

The EPA recognizes that the United States Department of Agriculture (USDA) has been working with the agricultural community to develop conservation systems and activities to control coarse particle emissions. Based on current ambient monitoring information, these USDA-approved conservation systems and activities have proven to be effective in controlling these emissions in areas where coarse particles emitted from agricultural activities have been identified as a contributor to a violation of the PM_{10} NAAQS. The EPA has found that where USDA-approved conservation systems and activities have been implemented, these systems and activities have satisfied the Agency's reasonably available control measure and best available control measure requirements for areas needing to attain the PM_{10} standards.

The EPA believes that in the future, certain USDA-approved conservation systems and activities that reduce agricultural emissions of fine particles may be able to satisfy the requirements of applicable sources to implement reasonably available control measures for purposes of attaining the $PM_{2.5}$ NAAQS. The EPA will work with States to identify appropriate measures to meet their RACM requirements, including site-specific conservation systems and activities. The EPA will continue to work with USDA to prioritize the development of new conservation systems and activities; demonstrate and improve, where necessary, the control efficiencies of existing conservation systems and activities; and ensure that appropriate criteria are used for identifying the most effective application of conservation systems and activities.

Comment: Some commenters raised concerns about a statement in the proposal that ''[i]n addressing a nonattainment area having military training, testing and operational activities occurring within it, the State should not need to target these activities for emission reductions.'' Some commenters interpreted this statement as an exemption from any emission reduction requirements for military sources.

Response: The statement in the proposal was not intended as an exemption for all military activities. Emissions potentially contributing to $PM_{2.5}$ concentrations at military installations originate from a variety of sources: basic operational activities (such as power generation, other fuel combustion, and transportation to and from residences, offices, and schools); and from field training and testing activities (such as personnel training, obscurants used in training, operation of nonroad vehicles and equipment, and related prescribed burning operations). The EPA believes that in evaluating emissions for a specific nonattainment

area having military activities occurring within it, the State should consult with DOD for information on the nature of these activities and their associated emissions.

With regard to military training activities specifically, such activities are periodic in nature, and when they do occur, the principal type of emissions generated by these activities is dust (i.e. inorganic direct PM emissions) from field operations. Other pollutants may be emitted to a lesser degree from certain onroad and nonroad motor vehicles. While military training activities may contribute some degree of primary $PM_{2.5}$ emissions to certain nonattainment area inventories, the fugitive dust generated from military training activities is predominantly composed of coarse PM rather than fine PM.

Based on data from the $PM_{2.5}$ speciation monitoring network operated by EPA and the States, the contribution of inorganic dust to total $PM_{2.5}$ mass on an annual average basis is relatively low in most nonattainment areas, on the order of 0.5 to 1.5 micrograms per cubic meter (generally 10% or less of total $PM_{2.5}$ mass). Dust from military training activities would be a subset of these levels. Depending on the available information and specific circumstances for a particular area, a State could find in its SIP development analyses that direct $PM_{2.5}$ emissions from military training activities do not significantly contribute to $PM_{2.5}$ concentrations in the nonattainment area, and therefore would not need to target military training activities for emission reductions in its attainment plan.[40]

7. How Should States Consider EGU Reductions for CAIR in Meeting RACT/RACM Requirements?

a. Background

In section III.I.11 of the preamble to the proposed rule, we discussed the nature of the SO_2 and NO_X RACT obligations of electric generating unit (EGU) sources in states subject to the CAIR emission reduction requirements. The CAIR rulemaking was finalized in March 2005 and published at 70 FR 25221 (May 12, 2005). CAIR requires 28 states and the District of Columbia to significantly reduce emissions of SO_2 and/or NO_X. The 26 jurisdictions in the CAIR $PM_{2.5}$ region are required to reduce annual emissions of SO_2 and NO_X, and the 26 jurisdictions in the CAIR ozone region are required to reduce seasonal emissions of NO_X. These jurisdictions also have the option of participating in EPA-administered annual SO_2, annual NO_X, and seasonal NO_X cap-and-trade programs (the CAIR trading programs) to meet these emission reduction requirements. In addition, in March 2006, EPA promulgated a Federal implementation plan (FIP) to implement CAIR in these jurisdictions until they have EPA approved CAIR SIPs in place (71 FR 25328, April 28, 2006). The FIP adopts, as the control measure, the CAIR trading programs slightly modified to allow for Federal instead of State implementation. When fully implemented, CAIR will reduce SO_2 emissions in these jurisdictions by over 70 percent and NO_X emissions by over 60 percent from 2003 levels. This will result in $85 to $100 billion in health benefits and nearly $2 billion in visibility benefits per year by 2015 and will substantially reduce premature mortality in the eastern United States. The benefits will continue to grow over time as the program is fully implemented (i.e., the SO_2 emission bank is depleted and the final cap is met), and as growth in populations and the aging of the population continues (which increases the susceptible population).

Sources subject to cap-and-trade programs such as the CAIR trading programs generally have the option of installing emissions control technology, adopting some other strategy to reduce emissions, or purchasing emissions allowances and thereby effectively paying other sources covered by the cap to reduce emissions. In the proposal, we noted that a number of EGUs expected to be covered by the CAIR trading programs are located in nonattainment areas. Based on emissions projections for 2010 and 2015 using the Integrated Planning Model (IPM), some of these EGUs are expected to comply with CAIR by purchasing allowances under the trading program and some are expected to comply by installing emission controls.

The proposal also described our past experience with the implementation of the NO_X SIP Call and our belief that many power companies will develop their strategies for complying with CAIR based, in part, on consultations with State and local air quality officials in order to address local $PM_{2.5}$ and ozone attainment planning needs. The EPA suggested that consultations on location of CAIR controls would be timely during State development of the CAIR SIP, which is due in 2006, prior to the April 2008 deadline for submitting $PM_{2.5}$ nonattainment area SIPs.

The EPA proposed a determination that in States that fulfill their CAIR SO_2 emission reductions entirely through EGU emission reductions (i.e. without reductions from non-EGU sources or allowing non-EGU sources to opt-in to the CAIR SO_2 trading program), participation in the CAIR SO_2 trading program would satisfy the SO_2 RACT requirement for the EGU sources. The EPA also proposed that in states that fulfill their CAIR NO_X emission reductions entirely through EGU emission reductions, CAIR would satisfy NO_X RACT for the EGU sources, provided that those sources with existing selective catalytic reduction (SCR) emission control technology installed on their boilers operate that technology on a year-round basis beginning in 2009. Note that direct $PM_{2.5}$ emissions are not addressed by the CAIR program, and EPA did not propose any determination that compliance with CAIR would satisfy RACT for direct $PM_{2.5}$ emissions. The proposal included a discussion of the rationale for these proposed determinations for SO_2 and NO_X, and requested comments on the issue.

b. Final Rule

As discussed in section II.F.2 on our overall policy for RACT and RACM, we consider an area's obligation to implement RACT to be part of the area's overall RACM obligation—to adopt those reasonably available measures needed to reach $PM_{2.5}$ attainment as expeditiously as practicable. The final rule also reflects this combined RACT/RACM approach regarding EGU control obligations under CAIR and the extent to which meeting CAIR also satisfies a source's RACT and RACM requirements for attainment.

Specifically, the final rule includes a presumption that in States that fulfill their CAIR SO_2 emission reduction requirements entirely through EGU emission reductions (i.e. without reductions from non-EGU sources or allowing non-EGU sources to opt in to the CAIR SO_2 trading program), compliance by EGU sources with an EPA-approved CAIR SIP or a CAIR FIP would satisfy their SO_2 RACT/RACM requirements for attaining the fine particle NAAQS. This section also includes a presumption that in States

[40] Windblown dust from agricultural tilling activities also can be a periodic source of inorganic PM in some areas. In some cases such dust would be expected to be predominantly composed of coarse PM rather than fine PM. Depending on the available information and specific circumstances for a particular area, it is possible that a State could find in its SIP development analyses that direct $PM_{2.5}$ emissions from agricultural tilling activities do not significantly contribute to annual average $PM_{2.5}$ concentrations in the nonattainment area, and therefore would not need to require emission reductions from agricultural tilling activities in the plan for attaining the annual standard. However, States should be mindful of the contribution of these sources to 24-hour fine particle concentrations.

that are subject to CAIR annual NO_X emission reduction requirements and fulfill these requirements entirely through EGU emission reductions (i.e. without reductions from non-EGU sources or allowing non-EGU sources to opt in to the CAIR annual NO_X trading program), compliance by EGU sources with an EPA-approved CAIR SIP or a CAIR FIP would satisfy the NO_X RACT/RACM requirement for the $PM_{2.5}$ NAAQS, provided that the sources with existing selective catalytic reduction (SCR) emission control technology installed on their boilers operate that technology on a year-round basis beginning in 2009. This final position is based on a number of factors identified in the proposal and discussed below.

Many $PM_{2.5}$ nonattainment areas are projected to achieve significant SO_2 and NO_X reductions under the CAIR program. We do not believe that requiring source-specific RACT/RACM controls on specified EGUs in nonattainment areas would reduce total SO_2 and NO_X emissions from sources covered by CAIR below the regionwide levels that will be achieved under CAIR alone. Nor do we believe that ''beyond CAIR'' EGU controls for SO_2 and NO_X are ''reasonably available'' control measures for most areas within the CAIR Region. Accordingly, most States need not evaluate additional control measures on EGUs to satisfy RACT/RACM requirements as explained above.

As discussed previously, we are not requiring that States impose RACT on any specific size or type of source. Instead, States must conduct a RACT/RACM analysis considering measures that are ''reasonably available'' to meet the overarching requirement to attain the standards as expeditiously as practicable. Thus, the final rule imposes no specific requirement on States to impose RACT/RACM on EGUs.

Nonetheless, in evaluating RACT/RACM for EGUs, EPA believes it is appropriate for States (states that achieve all reductions from EGUs) to consider the special attributes of that group of facilities including the unique interrelated nature of the power supply network, and their participation in the CAIR program. For EGUs in the CAIR region, based upon the presumption explained here, States may define RACT/RACM as the CAIR level of control on the collective group of sources in the region rather than impose a specific level of control on an individual source. This approach is similar to the Agency's past ''bubble'' policy, as discussed in section (c) addressing comments on the proposal.

As discussed more fully in the CAIR final rulemaking notice, EPA has set the 2009 and 2010 CAIR caps for SO_2 and NO_X at a level that will require EGUs to install emission controls on the maximum total capacity on which it is feasible to install emission controls by those dates. The EPA concluded that the CAIR compliance dates represent an aggressive schedule that reflects the limitations of the labor pool, and equipment/vendor availability, and need for electrical generation reliability for installation of emission controls.

Although the actual SO_2 cap does not become effective until 2010, we designed banking provisions in CAIR so that covered EGUs will begin to reduce their SO_2 emissions almost immediately after CAIR is finalized, and will continue steadily to reduce their emissions in anticipation of the 2010 cap and the more stringent cap that becomes effective in 2015. The 2015 SO_2 and NO_X caps are specifically designed to eliminate all SO_2 and NO_X emissions from EGUs that are highly cost effective to control (the first caps represent an interim step toward that end).

Moreover, we predicted that the majority of large coal-fired utilities will install advanced control technologies under CAIR because the larger and higher emitting source offer an opportunity to obtain more cost-effective emissions reductions. We expect that the largest-emitting sources will be the first to install SO_2 and NO_X control technology and that such control technology will gradually be installed on progressively smaller-emitting sources until the ultimate cap is reached. As a result, few, if any coal-fired units with greater than 600 MW of operating capacity should operate in $PM_{2.5}$ nonattainment areas without advanced control after full implementation of CAIR. Of the remaining units operating without advanced pollution controls, a great many of these units will have operating capacities below 300 MW. We predict that these units ''will be utilized less often,'' and ''typically have baghouses and electrostatic precipitators for particulate control, have combustion controls for NO_X control, and burn low-sulfur coal.'' See ''Contributions of CAIR/CAMR/CAVR to NAAQS Attainment: Focus on Control Technologies and Emission Reductions in the Electric Power Sector,'' Office of Air and Radiation, U.S. Environmental Protection Agency, April 18, 2006 (available at *http://www.epa.gov/airmarkets/cair/analyses/naaqsattainment.pdf*). In light of these expected results, we generally believe that the cost to install additional controls on these smaller units would be unreasonable.

We are also concerned that if States require specific EGUs to install advanced pollution control measures, it could interfere with the market-based incentives inherent in the cap and trade program. This could increase the cost of compliance and shift the location of the units that would otherwise opt to install advanced emissions controls. Such a result may be counterproductive to that State's attainment efforts, as the State may forego a larger quantity of more beneficial reductions in transported pollutants, in exchange for a smaller quantity and less beneficial reduction in local emissions. Moreover, it may reduce the benefits expected in other nonattainment areas as well. Accordingly, even if a State found the cost to control an individual unit acceptable on a cost per ton basis, the potential overall disbenefit of control may nonetheless make imposition of the control not ''reasonably available.''

The EPA finds that the control installations projected to result from CAIR NO_X and SO_2 caps in 2009 and 2010 are as much as feasible from EGUS across the CAIR Region by those dates. In fact, if states chose to require smaller-emitting sources in nonattainment areas to meet source-specific RACT requirements by 2009, they would likely use labor and other resources that would otherwise be used for emission controls on larger sources. Because of economies of scale, more boiler-makers may be required per megawatt of power generation for smaller units than larger units. In this case, the imposition of source-specific RACT/RACM on smaller emitting sources by 2009 could actually reduce the amount of banking that would otherwise occur and result in higher SO_2 emissions in 2009 as compared to the level that would result from implementation of CAIR alone.

In any event, the imposition of source-specific control requirements on a limited number of sources also covered by a cap-and-trade program would not reduce the total regionwide emissions from sources subject to the program. Under a cap-and-trade program such as CAIR, a given number of allowances are issued in order to achieve a given emission level. Source-specific control requirements within the CAIR program may affect the temporal distribution of emissions (by reducing banking and thus delaying early reductions) or the spatial distribution of emissions (by moving them around from one place to another), but they would not affect total regional emissions under the program. If source-specific requirements were targeted at the units

that could be controlled most cost-effectively, then the imposition of source-specific controls would likely achieve the same result as the cap-and-trade program. If not, however, the imposition of source-specific requirements would make any given level of emission reduction more costly than it would be under the cap-and-trade program alone. Thus, the imposition of source-specific RACT on EGUs covered by CAIR would not reduce total regionwide emissions, but would likely achieve emission reductions under the program in a more costly way.

Given the considerations described above, we think that in many areas additional controls on EGUs generally would not be ''reasonably available.'' Notwithstanding these conclusions, we recognize that States are in the best position to determine how best to achieve attainment with the $PM_{2.5}$ NAAQS in light of local needs and conditions. As we acknowledged in our proposed rule, power plant operators typically have ongoing relationships with the State and local officials involved in air quality planning. We expect that power plants will continue to collaborate with State officials to determine how best to address multiple air quality goals, and which plant locations to control under CAIR, considering local $PM_{2.5}$ and ozone attainment needs.

The EPA expects States and local air agencies to identify reasonably available control measures that are necessary and reasonable to attain the standards as expeditiously as practicable; and that after consulting with power companies, the State may conclude that establishing additional ''beyond CAIR'' emission control requirements on specific sources in nonattainment areas is warranted to provide for attainment as expeditiously as practicable. Nevertheless, in preparing the overall attainment demonstration, States should be aware of the expected benefits of the market-based incentives of the CAIR program, the cost effectiveness of control, feasibility of implementation, and any disbenefits that would result from requiring ''beyond CAIR'' controls on any specific EGU before concluding that additional controls on EGUs are ''reasonably available'' and necessary to satisfy RACT/RACM requirements.

Year-round NO_X controls. In the CAIR final rulemaking notice, EPA found that the operation of existing SCRs on a year-round basis, instead of operating them only during the ozone season, could achieve NO_X reductions at low cost relative to other available NO_X controls. The EPA projected that power generators would employ this control measure to comply with CAIR SIPs. Based on this control opportunity, EPA estimated the average cost of non-ozone-season NO_X control at $500/ton. These considerations support a finding that RACT should include year-round operation of existing SCRs that are located in $PM_{2.5}$ nonattainment areas. Because all $PM_{2.5}$ nonattainment areas violate the annual form of the $PM_{2.5}$ standard and public health can be affected by high $PM_{2.5}$ levels in the winter as well as the summer, we believe that year-round operation of existing SCR that are located in nonattainment areas where NO_X is an attainment plan precursor will provide additional health benefits for relatively low dollar cost per ton of pollutant reduced.

In the proposal notice, EPA proposed to define ''existing'' SCRs as those units that were in place by the date of the proposed rule (November 1, 2005). We selected this date rather than the final date to avoid creating an incentive to delay installation of new SCR. Today, we finalize our proposed approach with one clarification. To avoid confusion over the proper interpretation of the phrase ''in place,'' we are clarifying that an existing SCR is one which is fully installed and capable of operation by November 1, 2005.

We also proposed that these existing SCR begin year-round operations no later than January 1, 2009 to qualify as RACT/RACM under our presumptive approach. We noted that year round operation of existing SCR involves little to no alteration of existing equipment, and that EGUs could conduct any required work during normal outages. Today, after taking these factors into account, we finalize our proposed rule. The year-round operation requirement, however, will not be federally enforceable to individual EGUs until EPA approves a State's SIP including the requirement.

c. Comments and Responses

Comment: Some commenters supported the proposed determination described in section (a) that in States that fulfill their CAIR SO_2 emission reduction requirements entirely through EGU emission reductions (i.e. without reductions from non-EGU sources or allowing non-EGU sources to opt in to the CAIR SO_2 trading program), compliance by EGU sources with an EPA-approved CAIR SIP or a CAIR FIP would satisfy the SO_2 RACT requirement for the sources; and in States that are subject to CAIR annual NO_X emission reduction requirements and fulfill these requirements entirely through EGU emission reductions (i.e. without reductions from non-EGU sources or allowing non-EGU sources to opt in to the CAIR annual NO_X trading program), compliance by EGU sources with an EPA-approved CAIR SIP or a CAIR FIP would satisfy the NO_X RACT requirement for the sources, provided that the sources with existing selective catalytic reduction (SCR) emission control technology installed on their boilers operate that technology on a year-round basis beginning in 2009. One commenter supported EPA's approach so long as States may pursue additional reductions from EGUs if needed for attainment as expeditiously as practicable. A number of other commenters opposed the proposed determination regarding RACT for EGUs based on a number of issues.

Response: Based on the rationale described in the sections above, the final rule includes a presumption that compliance with CAIR satisfies SO_2 and NO_X RACT/RACM requirements for EGUs in many areas. Nonetheless, States can require ''beyond CAIR'' EGU controls if a State determines that it is a necessary and reasonable means to attain the $PM_{2.5}$ standards. Comments opposing this approach are addressed in more detail below.

Comment: A number of commenters objected to the proposed determination, arguing that it would result in greater control requirements and economic burden on non-EGU sources located in nonattainment areas. These commenters urged EPA to adopt a final rule that provides for implementing the most cost-effective controls necessary to attain the standard. They assert that with the proposed finding that compliance with CAIR satisfies RACT for EGUs, the proposed rule would not provide for the most cost-effective approach to attainment. They argue EPA and States should develop cost-effectiveness guidance that includes all stationary source control measures and they should develop SIPs based on the most economic means to attain the standard. They make several arguments to support this position. The commenters asserted that if an EGU control is more cost-effective than a non-EGU control, the EGU should be subject to ''beyond-CAIR'' controls. They also asserted that if EPA chooses to consider the CAIR rule as satisfying SO_2 and NO_X RACT for EGUs, then other sources should not be subjected to control costs greater than those found reasonable under CAIR (i.e., $800/ton). They believe it would be inequitable to require smaller sources to pay a higher cost for emissions reductions than larger sources, which are a more significant

contributor to the problem and which may be able to make more cost-effective emission reductions. One commenter also suggested that EPA should authorize a presumption that emissions reductions required on electric utilities under the CAIR will be equivalent to RACT only if a particular source in a CAIR State has installed controls that achieve the average level of control that EPA has projected will occur for the particular pollutant under the CAIR requirements.

Response: The EPA has determined that implementation of the CAIR trading program represents highly cost-effective controls that will achieve widespread regional SO_2 and NO_X emissions reductions from EGUs and will provide significant air quality benefits for ozone and $PM_{2.5}$ nonattainment areas. In developing attainment SIPs and identifying RACM, States will need to consider additional cost-effective and reasonable controls to reach attainment as expeditiously as practicable. The EPA does not agree with the commenter's argument that controls on non-EGUs should be no more than the projected cost of EGU controls under CAIR. The EPA expects that in order to achieve attainment as expeditiously as practicable, some States may need to adopt control measures for some sources which cost more per ton but which still are considered to be reasonable and cost-effective.

In addition, States must consider the economic feasibility of implementing a given control measure. Because of facility-specific factors, EPA believes it would be inappropriate to establish a threshold of control effectiveness (e.g. dollars per ton) based on control of EGUs and apply this threshold to all source categories. The ability of a source to cost-effectively reduce emissions is dependent on case-specific factors, including the ability of the given source to sustain the cost of control, and prevailing costs in the specific geographical location. A direct correlation between the size of an emissions source and the economic feasibility of controls for that source and location does not necessarily exist.

We also disagree with the commenter who suggests that RACT requirements should only be satisfied if a source achieves an average level of control that EPA projects to occur under CAIR. The EPA maintains that the presumption that CAIR satisfies SO_2 and NO_X RACT/RACM for EGUs in most areas is an appropriate policy. As discussed further below, we have always recognized that States could determine RACT for a single source or group of sources.

Comment: A number of commenters opposed the proposed determination that CAIR would satisfy the SO_2 and NO_X RACT requirement for EGUs. The commenters argued that this determination is unlawful, that it does not comply with section 172(c)(1) of the CAA which requires RACT (i.e. controls that are technologically and economically feasible) ''at a minimum'' for all existing sources in the nonattainment area, that it would allow very large stationary sources to escape cost-effective controls entirely, and that it is largely based on the legally-irrelevant contention that CAIR will reduce emissions more cost-effectively than RACT. They claim that EPA has no authority to displace the Congressionally-mandated RACT requirement, that CAIR was designed to address regional pollution transport (not to be an attainment strategy), and that EPA should remove these proposed provisions in the final rule. Commenters claim that the EPA's proposed approach to allow EGU emissions to be addressed solely through CAIR would undermine states' efforts to meet the Federal $PM_{2.5}$ health standard, particularly when EGU sources are among the most cost-effective to control. Another commenter claimed that EPA's proposal allowing States that choose to fulfill their CAIR requirements entirely through emission reductions from EGUs to also use CAIR to satisfy their SO_2 and NO_X $PM_{2.5}$ RACT requirements, thereby equating these two requirements for the EGU sector, is flawed. This commenter argued that allowing a cap-and-trade program, such as the CAIR, to substitute for the RACT requirement undermines the effectiveness of the controls by allowing facilities to use allowances to offset emissions, rather than control them at the source. The purchase of allowances, they assert, does not satisfy RACT requirements.

Response: The EPA disagrees with these comments. The final rule does not displace the RACT requirement for any sources. Instead, EPA is exercising its authority to interpret the section 172 RACT and RACM requirements for the purposes of implementing the 1997 $PM_{2.5}$ standards. For the reasons described in section (b) above, we believe that States can rely on EPA's presumption that compliance with a CAIR SIP or FIP, meeting certain requirements, will satisfy the RACT/RACM requirement for certain EGU sources. The EPA historically issued control technology guidelines setting forth presumptive levels of emissions control that satisfy the RACT requirement for a given industry. The final rule is similar to this practice in establishing a presumption that SO_2 and NO_X reductions under the CAIR program satisfy the RACT/RACM requirement for EGUs in CAIR States. In identifying reasonably available control measures to ensure attainment as expeditiously as practicable, States will need to take CAIR reductions into account as well as any additional cost-effective reductions that are technologically and reasonably available.

We further find that the attempt by many commenters to characterize CAIR as a strategy to address only regional pollution transport and not an attainment strategy as overly simplistic. The EPA analyses for CAIR show that there are significant air quality benefits projected for individual nonattainment areas as a result of SO_2 and NO_X reductions across the multistate CAIR region. The Act does not prevent States from properly crediting measures that achieve multiple objectives (e.g. regional transport or local nonattainment). Moreover, Section 110(a)(2)(D) requires SIPs to contain adequate provisions to assure that sources in the State do not contribute significantly to nonattainment in any other State. The CAIR rule is an integral element in meeting the States' Section 110 attainment obligations. Accordingly, it is reasonable to incorporate this consideration in determining what measures qualify as RACT/RACM.

Finally, EPA does not interpret the provisions of Section 172(c)(1) related to the RACT requirement as precluding States' use of a cap and trade approach as a means of regulating existing sources and achieving RACT/RACM reductions, especially in light of Congresses' expressed authorization to auction emission rights in Section 172(c)(6).

The EPA has long recognized that RACT need not apply to individual sources. As stated earlier, our early guidance on RACT requirements stated that States could establish RACT for an ''individual sources or *a group of sources.*'' (emphasis added) See Memo. Strelow (Dec. 1976) and 44 FR 71779. Importantly, Congress ratified the early interpretations of RACT and RACM when it enacted the 1990 Amendments. See 42 U.S.C. Section 7515 (Clean Air Act section 193). Our 1986 emissions trading policy also recognized a number of advantages offered through application of a ''bubble'' approach including faster compliance with RACT limits and earlier reductions. Moreover, Courts have upheld EPA's approval of States' use of ''bubbling'' multiple units to meet RACT requirements. See e.g.

Natural Resources Defense Council v. *EPA*, 941 F.2d 1207 (finding that EPA need not adhere to a source specific RACT determination to satisfy RACT requirements and acknowledging EPA's special knowledge and expertise in the area.)

Comment: The EPA's proposal to allow EGU emissions to be addressed solely through CAIR undermines prospectively States' efforts to meet the Federal $PM_{2.5}$ health standard. EGU sources are among the most cost-effective to control.

Response: For the reasons described in section (b) above, EPA believes that States can rely on EPA's presumption that compliance with a CAIR SIP or FIP, meeting certain requirements, satisfies the SO_2 and NO_X RACT/RACM requirement for certain EGU sources. Areas can require ''beyond CAIR'' EGU controls if a State determines that it is a necessary and reasonable means to attain as expeditiously as practicable. Nonetheless, as discussed above, EPA believes that implementation of the CAIR requirements will provide for substantial progress in attaining the $PM_{2.5}$ standards and that States may presume that RACT/RACM requirements are equal to the CAIR level of control.

Comment: CAIR fails to address the need for short-term reductions in $PM_{2.5}$ and precursor emissions on high pollution days. While RACT restricts emissions over a 1-hour to 24-hour period, CAIR only provides for an annual or seasonal cap. Reliance on CAIR therefore fails to recognize the importance of reducing short-term emissions, which was recently highlighted by the EPA's own proposal to tighten the 24-hour $PM_{2.5}$ health standard. Local and short-term adverse air quality effects of $PM_{2.5}$, must be addressed in the final rule by requiring RACT for all major facilities in addition to CAIR.

Response: The CAIR program is oriented toward reducing SO_2 and NO_X emissions in order to reduce air quality concentrations on an annual and seasonal basis. Because all $PM_{2.5}$ nonattainment areas were designated due to violations of the annual standard (and the two designated areas in California also violated the 24-hour standard), the focus of this implementation rule is attainment of the annual standard. CAIR is projected to provide significant air quality benefits in 2010 and 2015 for eastern $PM_{2.5}$ nonattainment areas on both an annual basis and on a 98th percentile 24-hour basis.[41]

Comment: The proposal is silent on the issue of whether EGUs are subject to direct $PM_{2.5}$ emissions RACT requirements. It is critical that RACT be required for all facilities with respect direct $PM_{2.5}$ emissions, regardless of a facility's participation in CAIR.

Response: In the final rule and preamble, EPA has clarified that all EGUs in nonattainment areas are subject to RACT/RACM for direct $PM_{2.5}$ emissions. The presumption described above applies only to SO_2 and NO_X RACT/RACM, not RACT/RACM for direct $PM_{2.5}$ emissions from EGUs.

Comment: The EPA fails to consider the geographical distributional impacts of the emission reductions. Equating CAIR with RACT fails to take into account the substantial contribution that emissions from EGUs within a nonattainment area may make toward that area's $PM_{2.5}$ nonattainment problem. The EPA does not attempt to explain how such a generalized determination satisfies RACT for $PM_{2.5}$.

Response: The establishment of recommended levels for RACT/RACM is an area Congress delegated to the specific expertise of the Agency. Based on our analysis, we conclude that the CAIR emissions caps presumptively represent the level of emissions control achievable through application of ''reasonably available'' control technologies. Nonetheless, in developing attainment plans, each State will evaluate the impact of stationary sources located within the nonattainment area in developing its attainment strategies for the local area.

Comment: A few commenters stated that EPA should explain how this proposal would be implemented for States that request an extension of an attainment date because attaining in 5 years or less is impracticable; i.e., whether EPA would still hold to its interpretation that CAIR equals RACT for EGUs and not require additional reductions from EGUs even if an area cannot attain in 5 years and controls on EGUs could lead it to attain more expeditiously. These commenters argue that, in considering if additional RACT is needed in states that obtain extensions of the attainment deadline after 2010, EPA cannot ignore potential RACT for electric generating units any more than they would be allowed legally to avoid consideration of any other RACT candidates. One commenter is particularly concerned that States would not include EGUs in their RACT determinations and instead require smaller industrial boilers or process heaters to control emissions.

Response: The EPA's determination regarding CAIR and RACT is not limited to areas attaining within five years. The Agency's rationale is presented in the ''final rule'' section above. We disagree that the CAIR–RACT presumptions necessarily shift emission control burdens from EGUs to smaller industry boilers and process heaters because, in implementing the RACM requirement, the State may include an evaluation of control options on those sources as part of their RACT/RACM analyses. As stated above, EPA concluded that the CAIR compliance dates represent an aggressive schedule that reflects the limitations of the labor pool, and equipment/vendor availability, and need for electrical generation reliability for installation of emission controls. Accordingly, additional controls on EGUs may not be a reasonably available control measure that can be effectively implemented in a manner that advances an area's attainment date.

Comment: The EPA designated many partial counties nonattainment for $PM_{2.5}$ solely because the areas contained EGU emission sources thought to cause or contribute to violations of the NAAQS. In implementing attainment plans, it makes sense to consider further control of these sources, and because they are located in nonattainment areas, the ability to do so is provided for and legal under the CAA.

Response: The EPA designated $PM_{2.5}$ nonattainment counties because they either had a violating monitor or they contributed to a nearby air quality problem. Importantly, EPA designated these areas without considering the air quality benefits expected in the future from CAIR. Accordingly, the fact that an EGU is located in a partial county and we included the partial county in the nonattainment area because we believe that the EGU was causing or contributing to the nonattainment violations, does not equate with a finding that more than CAIR is required to remedy the nonattainment problem. Nonetheless, EPA believes that States should evaluate the impact of stationary sources in all designated counties, including those partial counties noted by the commenter, in its assessment of reasonably available control strategies to ensure attainment as expeditiously as practicable.

Comment: The EPA should adopt the Ozone Transport Commission's (OTC's) approach to cap-and-trade programs. When the OTC developed its NO_X

[41] See the regulatory impact analysis chapter on air quality for the 2006 PM NAAQS review at *http://www.epa.gov/ttn/ecas/regdata/RIAs/Chapter%204-Air%20Quality.pdf.*

Budget Program (which was the basis for EPA's NO_X SIP call and subsequently CAIR), it assumed that RACT was applied first. Thus the cap-and-trade program operated in an environment that assumed RACT was in force, not in lieu of RACT.

Response: Under the ozone national ambient air quality standards, NO_X and VOC RACT have been implemented progressively for the past 30 years or more, prior to development of the NO_X SIP call regional control program. In contrast, the $PM_{2.5}$ implementation program is the first instance in which we have required RACT/RACM specifically for fine particle pollution. For this reason, the CAIR program is not operating with SO_2 and NO_X RACT limits already in place for attainment of the $PM_{2.5}$ standards. Nonetheless, as discussed above, EPA believes that implementation of the CAIR requirements will provide for substantial progress in attaining the $PM_{2.5}$ standards and that States may presume that RACT/RACM requirements are equal to the CAIR level of control.

Comment: A few commenters stated that EPA should clarify and modify the part of its proposal that explains why a State cannot rely on EPA's determination that CAIR can satisfy the NO_X RACT requirement for $PM_{2.5}$ if the State ''elect[s] to allow non-EGU sources to voluntarily enter the EPA-administered CAIR trading program through an opt-in provision in the CAIR model rule.'' (70 FR 66025 col. 3). These commenters believe that this part of the proposal might be construed to preclude States subject to both the NO_X SIP Call and included in the CAIR region for ozone from relying on the NO_X RACT determination for $PM_{2.5}$ if the States choose ''to bring their non-CAIR [including non-EGU] NO_X SIP Call trading sources into the CAIR ozone season NO_X cap and trade program.'' (70 FR 49708, 49728 col. 3) (August 24, 2005). The commenters assert that EPA gave States the option of bringing non-EGU NO_X SIP Call sources into the CAIR seasonal NO_X trading program to ensure that non-CAIR sources, including non-EGUs, that are subject to the NO_X SIP Call rule would not be ''stranded,'' starting in 2009, by being left in an ozone season NO_X control program with no EGU trading partners. The commenters argued that ''EGUs should not be penalized, in the form of denial of CAIR–RACT treatment, as a result of States exercising their option to avoid financial and compliance difficulties for non-EGUs that otherwise would be left without allowance trading partners in the EGU sector after the NO_X SIP Call trading program ends in 2008.'' These commenters point to EPA's determination in the final Phase 2 ozone implementation rule, that participation in the CAIR trading programs can satisfy NO_X RACT for ozone even if a State brings non-EGUs in the NO_X SIP Call trading program into the trading program after 2008, *see* 70 FR 71657 col. 2, provided the State retains an ''EGU [emission] budget under CAIR that is at least as restrictive as the EGU budget that was set in the State's NO_X SIP call SIP,'' id. At 71658 col. 1. These commenters argue that EPA should make a similar determination here regarding NO_X RACT for purposes of $PM_{2.5}$ NAAQS implementation.

Response: All states with EPA approved CAIR SIPs or subject to a CAIR FIP implementing the annual NO_X emission reduction requirements, and obtaining those reductions solely from EGUs may rely on EPA's determination that CAIR presumptively satisfies NO_X RACT/RACM for $PM_{2.5}$ for these sources. This determination is unaffected by whether or not a State permits NO_X SIP Call non-EGUs to participate in the CAIR ozone season trading program. In the final rule, we have included the presumption that NO_X RACT/RACM for $PM_{2.5}$ is satisfied for EGUs complying with a CAIR SIP or CAIR FIP implementing the annual CAIR NO_X emission reduction requirements (provided the State implementation of the CAIR NO_X annual trading program includes EGUs only).[42]

In the final ozone implementation rule, EPA addressed numerous issues relating to the transition from the NO_X SIP Call to the CAIR ozone season trading program, including the impact of bringing NO_X SIP Call non-EGUs into the CAIR ozone season trading program. Commenters' suggestion that these determinations are relevant to this $PM_{2.5}$ implementation rule ignores the fact that both the NO_X SIP Call and the CAIR ozone season trading program are seasonal, not annual, trading programs. The NO_X SIP Call EGU and non-EGU budgets are seasonal NO_X budgets and do not address annual NO_X emissions. As discussed above, $PM_{2.5}$ levels year-round contribute to an area's annual average concentration, and NO_X emissions during non-summer months contribute to nitrate concentrations, which are typically highest in cooler temperatures. For these reasons, EPA believes it would be inappropriate to accept commenters' suggestion.

8. What Are the Required Dates for Submission and Implementation of RACT?

a. Background

The EPA requested comment on a general approach for the dates for submission and implementation of RACT rules. The final rule retains the proposed approach, as described in the following section.

b. Final Rule

The final rule requires the following:

(1) Date of submission. States must submit adopted RACT rules to EPA within 3 years of designation, at the same time as the attainment demonstration due in April 2008.

(2) Dates for implementation of control measures. States should also implement any measures determined to be RACT expeditiously, as required by section 172. Implementation of RACT measures should in no case start later than the beginning of the year before the nominal attainment date. For example, if an area has an attainment date of April 2010, then any required RACT measures should be in place and operating no later than the beginning of 2009. This is intended to help provide for clean air in calendar year 2009. As discussed in section II.D, if other criteria are also met, EPA could then grant the area a 1-year attainment date extension if the air quality level in the 3rd of the 3 years was below the level of the standard. If the area observes a second year of clean air, EPA could grant a second 1-year attainment date extension. In this case, the 2009 to 2011 period would then be reviewed to assess whether the area attains the standards.

(3) Provisions for a demonstration that additional time is needed. While EPA expects that States will implement required RACT controls by January 2009 in most situations, there may be cases where additional time is needed to implement an innovative control measure or to achieve a greater level of reduction through a phased approach. If a State has provided an adequate demonstration showing that an attainment date extension would be appropriate for an area, then the State may consider phasing-in certain RACT controls after January 2009. The EPA would allow the implementation of selected RACT controls after January 2009 if the State can show why additional time is needed for

[42] EPA's CAIR–RACT presumption also would not apply if a State required sources other than EGUs to achieve a portion of the reductions required by CAIR (e.g., the State's CAIR SIP achieved some reductions from EGUs but took credit for non-EGU reductions achieved under new, more stringent requirements implemented to meet NO_X SIP call caps). Under the CAIR rule such a State would not be eligible to participate in the EPA-administered CAIR trading system.

implementation, and such delayed implementation still would need to be on a schedule that provides for expeditious attainment. In no event could the State wait to implement RACT controls until the last few years prior to the attainment date without an adequate rationale for why earlier implementation was not feasible.

c. Comments and Responses

Comment: One commenter supported EPA's position that implementation of RACT and RACM by January 1, 2009 is necessary to achieve the effect on air quality for calendar year 2009.

Response: The EPA agrees with this comment.

Comment: Some commenters supported allowing for an implementation schedule that allowed for implementation of RACT and RACM for a time frame extending beyond 2009. These commenters favored such an approach if States provided an adequate demonstration of why the measures cannot be implemented earlier. Commenters noted that a phased approach to emissions reductions in some cases could lead to additional reductions that could not occur by 2009.

Response: The EPA agrees with these comments.

Comment: One commenter believed that so long as a State demonstrates attainment by 2015, EPA should not require implementation of any RACT measures. The commenter further asserted that it would be bad policy to require costly emissions reductions through imposition of RACT on areas expected to attain the standards through other means by 2015.

Response: The EPA disagrees with this comment. The CAA requires States to demonstrate that the attainment plan will attain the standards as expeditiously as practicable and must include RACT and RACM. The requirement for ''reasonable'' measures does not require that any theoretical measure be implemented, but does require implementation of those reasonable measures which could advance the attainment date by at least 1 year. Given the health effects associated with $PM_{2.5}$, EPA believes this approach is sound public policy.

9. Which Pollutants Must Be Addressed by States in Establishing RACT and RACM Limits in Their $PM_{2.5}$ Attainment Plans?

a. Background

In the proposed rule, and in the final rule as discussed in detail in section II.A above, EPA discusses the pollutants which States must address in the attainment plans, in particular with respect to RACT, RACM and NSR. These pollutants include not only direct $PM_{2.5}$, but also gaseous precursors to the formation of $PM_{2.5}$. In general, the decisions that States and EPA make with respect to which precursors are significant contributors to an area's $PM_{2.5}$ nonattainment problem define the pollutants and sources to be addressed by States in developing RACT and RACM.

b. Final Rule

In the final rule, in establishing RACT and RACM limits, those RACT and RACM limits must address:

—Direct emissions of $PM_{2.5}$
—SO_2, a precursor to $PM_{2.5}$ formation, and
—NO_X, unless a State makes a finding that NO_X emissions from sources in the State do not significantly contribute to the $PM_{2.5}$ problem in a given nonattainment area.

The EPA generally presumes that RACT and RACM limits are not needed for ammonia or VOC unless that State or EPA determines otherwise for a given nonattainment area. RACT and RACM limits are needed for ammonia if a State or EPA makes a finding that ammonia emissions significantly contribute to the $PM_{2.5}$ problem in a given nonattainment area, and thus finds that control of ammonia would help address the $PM_{2.5}$ problem. RACT and RACM limits are needed for VOC only if a State or EPA makes a finding that VOC emissions significantly contribute to the $PM_{2.5}$ problem in a given nonattainment area. (As a point of clarification, ''VOCs,'' which are gaseous organic precursors to the chemical formation of secondary organic aerosol, are treated differently from semivolatile or nonvolatile organic compounds which are addressed as directly emitted $PM_{2.5}$). Issues related to the finding of ''significant contribution'' for these pollutants are discussed in Section II.A above.

10. Under the $PM_{2.5}$ Implementation Program, When Does a State Need To Conduct a RACT Determination for an Applicable Source That Already Has a RACT, BACT, LAER, or MACT Determination in Effect?

a. Background

For $PM_{2.5}$ nonattainment areas, States are required to implement the RACT requirement to reduce emissions of direct $PM_{2.5}$ and $PM_{2.5}$ precursors from applicable sources. The EPA anticipates that for some sources located in $PM_{2.5}$ nonattainment areas, the State would have previously conducted RACT determinations for VOC or NO_X under the 1-hour ozone standard, or for direct PM_{10} emissions under the PM_{10} standards. Some of the RACT determinations established under these other programs would be relatively recent while other determinations may be more than 10 years old. In some cases, a new RACT determination might reach the conclusion that the preexisting determination is still valid and would require the installation of similar control technology because the relevant pollutant was addressed, the same emission points were reviewed, and the same fundamental control techniques would still have similar costs. In other cases, however, a new RACT analysis could determine, for example, that better technology has become available, and that cost-effective emission reductions are achievable.

In the proposed rule, the EPA requested comments on a general approach to taking prior RACT determinations into account, and within the general approach, invited comments on two specific questions: (1) Should new RACT determinations be required for all existing determinations that are older than a specified amount of time (such as 10 years old)?; and (2) what supporting information should a State be required to submit as part of its certification to demonstrate that a previous RACT analysis meets the RACT requirement currently for purposes of the $PM_{2.5}$ program?

In the proposed rule, EPA also noted that sources subject to RACT may also have been subject to other prior technology determinations such as BACT, LAER or MACT determinations. The proposed rule requested comment on approaches to taking these prior technology determinations into account.

b. Final Rule

The EPA has determined that it is appropriate to follow the approach in the proposed rule, which is described below. State RACT SIPs for $PM_{2.5}$ must assure that RACT is met, either through a new RACT determination or a certification that previously required RACT controls represent RACT for $PM_{2.5}$.

Where a State adopted and EPA approved a control measure as RACT for a pollutant emitted from a specific stationary source or source category under another NAAQS program, the State may submit as part of its SIP revision a certification, with appropriate supporting information, that the previous determination represents a current RACT level of control for those emissions for purposes of the $PM_{2.5}$ program. Otherwise, the State should revise the SIP to reflect a modified

RACT requirement for specific sources or source categories.

In cases where the State's prior RACT analysis under another NAAQS program concluded that no additional controls were necessary, a new RACT determination is required for that source. In cases where the previous RACT determination did not require any controls on the source, it is more likely that a new review might find that emission controls are now economically and technically feasible. This is because emissions reductions from a potential control measure are likely to be greater, and the cost per ton of emission reduction is likely to be lower, than in the case of a source that previously installed controls to meet RACT under another program.

A RACT determination for a source or source category subject to a prior RACT determination is also required for any pollutants that were not the subject of the prior RACT determination, but which the State has determined should be regulated for purposes of $PM_{2.5}$. The EPA advises that the State should closely review any existing RACT determinations established under another NAAQS program. For RACT certifications and determinations, States are to consider new information that has become available since the earlier RACT determination. For example, where updated information on control technologies is presented as part of notice-and-comment rulemaking, including a RACT SIP submittal for sources previously controlled, States (and EPA) must consider the additional information as part of that rulemaking. Existing EPA guidance on control technologies can be used to help inform RACT decisions. However, EPA believes it may not be sufficient for a State to rely on technology guidance that is several years old and issued to provide recommendations on control measures and levels for a different NAAQS in evaluating RACT for $PM_{2.5}$.

With respect to prior technology determinations other than RACT, the final rule provides that:

(1) Prior BACT and LAER Determinations. In many cases, but not all, best available retrofit technology (BACT) or lowest achievable emission rate (LAER) provisions for new sources would assure at least RACT level controls on such sources. The BACT/LAER analyses do not automatically ensure compliance with RACT since the regulated pollutant or source applicability may differ and the analyses may be conducted many years apart. States may, however, rely on information gathered from prior BACT or LAER analyses for the purposes of showing that a source has met RACT to the extent the information remains valid. We believe that the same logic holds true for emissions standards for municipal waste incinerators under CAA section 111(d) and NSR/PSD settlement agreements. Where the State is relying on these standards to represent a RACT level of control, the State should present its analysis with its determination during the SIP adoption process.

(2) Compliance With MACT Standards Affecting VOC. In situations where the State has determined VOC to be a significant contributor to $PM_{2.5}$ formation in an area, compliance with MACT standards may be considered in VOC RACT determinations. For VOC sources subject to MACT standards, States may streamline their RACT analysis by including a discussion of the MACT controls and relevant factors such as whether VOCs are well controlled under the relevant MACT air toxics standard, which units at the facility have MACT controls, and whether any major new developments in technologies or costs have occurred subsequent to establishment of the MACT standards. We believe that there are many VOC sources that are well controlled (e.g., through add-on controls or through substitution of non-VOC non-HAP materials for VOC HAP materials) because they are regulated by the MACT standards, which EPA developed under CAA section 112. Any source subject to MACT standards must meet a level that is as stringent as the best-controlled 12 percent of sources in the industry. Examples of these HAP sources that may effectively control VOC emissions include organic chemical plants subject to the hazardous organic NESHAP (HON), pharmaceutical production facilities, and petroleum refineries.[43] We believe that, in many cases, it will be unlikely that States will identify VOC emission controls more stringent than the MACT standards that are not prohibitively expensive and are thus unreasonable. We noted our view that this will allow States, in many cases, to conclude that the control measures implemented to meet MACT standards satisfy any requirement for VOC RACT.

(3) Compliance With MACT Standards Affecting $PM_{2.5}$ Emissions. Compliance with MACT standards may be considered in direct $PM_{2.5}$ RACT determinations. For direct $PM_{2.5}$ sources subject to MACT standards, States may streamline their RACT analysis by including a discussion of the MACT controls and relevant factors such as whether $PM_{2.5}$ emissions are well controlled under the relevant MACT air toxics standard, which units at the facility have MACT controls, and whether any major new developments in technologies or costs have occurred subsequent to the MACT standards. We believe that there are many direct $PM_{2.5}$ sources that are well controlled (e.g., through add-on controls that represent state-of-the-art measures for $PM_{2.5}$ reduction) because they are regulated by the MACT standards which EPA developed under CAA section 112. For some MACT standards, $PM_{2.5}$ is used as a surrogate for achieving MACT for HAPs such as heavy metals. Any source subject to MACT standards must meet a level that is as stringent as the best-controlled 12 percent of sources in the industry. We believe that there will be sources for which it will be unlikely that States will identify emission controls more stringent than the MACT standards that are not prohibitively expensive and are thus unreasonable. In addressing whether a MACT standard represents best controls for $PM_{2.5}$, it is important that the State consider all $PM_{2.5}$ sources at a given facility and the nature of the PM limit (i.e., whether the limit ensures control of the fine fraction of particulate matter). Also, the State should evaluate the degree of capture of $PM_{2.5}$—that is, the amount of $PM_{2.5}$ that is collected and sent to a pollution control device in addition to the efficiency of the device itself. This evaluation should consider the $PM_{2.5}$ emissions reductions that could be achieved by improving the degree of capture.

(4) Year-Round Controls for NO_X. In some cases, sources subject to NO_X RACT for PM will also be subject to controls under the NO_X SIP Call. In the 8-hour ozone implementation rule, EPA concluded that certain sources which have installed emission controls to comply with the NO_X SIP call would be deemed to meet NO_X RACT for the purposes of the 8-hour ozone implementation program. Some of these sources subject to the NO_X SIP call may choose to control NO_X emissions only or primarily during the ozone season. For purposes of $PM_{2.5}$, however, EPA concludes that the operation of emission controls only or primarily during the ozone season would not constitute RACT for $PM_{2.5}$ purposes. Indeed $PM_{2.5}$ control programs must address annual average concentrations, and in many

[43] There are some MACT categories for which it may not be possible to determine the degree of VOC reductions from the MACT standard without additional analysis; for example, the miscellaneous metal parts and products (40 CFR part 60, subpart MMMM) due to the uncertainty of the compliance method that will be selected.

areas nitrate concentrations are generally highest in the winter. Therefore, RACT for $PM_{2.5}$ is year-round operation of controls. For sources subject to both the NO_X SIP call and NO_X RACT for PM, we believe that, in most cases, the additional costs of running the NO_X SIP call controls year-round would impose only modest, reasonable additional costs and the cost effectiveness would be better than the average cost effectiveness for many other sources subject to PM RACT. (See further discussion in section F.7 above related to EGU sources subject to CAIR requirements for NO_X).

c. Comments and Responses

Comments: A number of commenters agreed with the requirement for the State to conduct a new RACT determination for any source for which the State's prior RACT analysis under another NAAQS program concluded that RACT was defined as no additional controls. One commenter noted that for a source having a previous RACT determination for ozone or PM_{10} to show that its level of control currently meets RACT for $PM_{2.5}$ purposes, the source must provide supporting documentation showing that the previous RACT determination was based on the same universe of controls that are ''reasonably available'' for the source in the present day.

Response: The EPA agrees with these comments.

Comments: A few commenters recommended that EPA clarify that RACT determinations resulting only in ''operational changes'' should be treated in an equivalent manner as those resulting in no controls. The commenters suggested that, unlike ''physical modification,'' such operational changes should always be revisited with a new RACT determination.

Response: The EPA does not agree with the implicit recommendation to impose different RACT review requirements based on the types of control previously implemented. The EPA believes that a reassessment of RACT is warranted, irrespective of the type of control previously implemented, to consider the reasonableness of modifying or adding controls in the particular circumstances. Furthermore, we are concerned that making such a distinction based upon the fairly broad term ''operational change'' would be difficult to interpret and implement, and would invite unnecessary disputes concerning the application of the term.

Comment: Commenters differed on whether new RACT determinations should be required for all existing determinations made before a specific date, and on what that date should be. Some commenters recommended that EPA allow States to rely on any previous RACT determinations made after 1990, and one commenter recommended that EPA require States to review only those older than 10–15 years, another recommended 10 years. One commenter believed that a 15-year period would be reasonable where previous controls were installed, to allow for a 15-year amortization of the cost of those controls. Other commenters recommended that new RACT determinations be made for any RACT determinations older than 5 years. Another commenter recommended that all RACT determinations should be reviewed.

Response: The EPA has not included any specific time frame in the final rule. The EPA agrees that the more recent the RACT determination, the greater the probability that technology advances or decreases in control cost will not have occurred. At the same time, technology advances and decreases in control cost can and have occurred frequently. Accordingly, we believe it is necessary for States to review whether such technology advances or decreases in control cost have occurred before relying on previous RACT determinations. We do not believe there is any specific date or age that could be identified after which States could ensure that no technology advances or decreases in control cost will have occurred.

Comment: A number of commenters expressed concerns with the resources required to conduct the certifications required by the proposed approach, and argued that expending the resources required to review and to certify previous RACT determinations would not be productive. One commenter recommended that EPA provide guidance on the previous RACT categories for which old RACT determinations are believed to be out of date. Another commenter asserted that the only possible exception to the acceptability of previous RACT measures for purposes of the ozone standards would be when the new RACT is year-round for an existing ozone-season RACT measure.

Response: The EPA believes that the proposed certification approach strikes an appropriate balance in requiring States to verify whether previous RACT determinations currently represent an appropriate RACT level of control for $PM_{2.5}$ purposes, while stopping short of requiring an exhaustive re-analysis for all RACT sources. The EPA believes that much of the resource concerns expressed in comments were based upon concerns that VOC sources are very numerous, and that this approach would require detailed review for these sources. As noted previously, a RACT analysis for VOC sources is required only if a State makes a finding that VOC sources significantly contribute to nonattainment in the State. We believe the commenters likely overestimate the resource implications of the certification process for prior RACT determinations. Another mitigating factor is that many of these same sources would be reviewed for purposes of implementing the eight-hour ozone standard. On the other hand, where a State or EPA determines that it is appropriate to regulate VOC sources for $PM_{2.5}$, EPA believes that it likely would be productive to review the previous determination for such sources, some of which have not been reviewed for many years.

Comment: One commenter believed that EPA should acknowledge detailed RACT and RACM analyses for the South Coast and San Joaquin Valley in California prepared during the 1990s for purposes of implementing the ozone and PM_{10} standards. The commenter believes that EPA acceptance of these determinations as RACT for $PM_{2.5}$ would enable States to focus resources on developing new measures needed for attainment.

Response: The EPA agrees that States should focus resources on new technologies and new developments. At the same time, EPA recognizes that for most source categories, new technology continues to be developed, and new information continues to be generated. Thus, even recent RACT determinations for a given source category may be outdated. Hence, the certification approach in the rule for the relevant sources or source categories is a reasonable approach which is designed to provide for the type of focused efforts suggested by the commenter.

Comment: One commenter believed that a State certification should only have to identify the existing RACT levels in a SIP and pollutants affected, but the State should not be required to provide any additional information.

Response: The EPA disagrees with this comment. The EPA believes that prior technology determinations should be taken into account in the RACT determination process. In reviewing existing RACT determinations, the State should provide supporting information to show that the existing technology in use should still be considered RACT, or it should show that there have been technology advances or cost reductions that have occurred since the previous

RACT limits were developed that make lower emissions technically and economically feasible in the context of RACT and would contribute to advancing the attainment date by at least one year.

Comment: Some commenters supported EPA's requirement for year-round operation of NO_X pollution control devices as RACT, given that $PM_{2.5}$ is an annual standard, while ozone is a summertime problem.

Response: The EPA agrees with these comments.

Comment: One commenter concluded that BACT and LAER determinations should be considered to satisfy RACT, regardless of the date they were made, because BACT and LAER by definition are more stringent than RACT.

Response: The EPA disagrees with this comment. The EPA believes that in many cases, but not all, BACT and LAER would assure RACT level of controls. Reasons that BACT and LAER might not satisfy RACT include: The pollutant of concern could have been different, the applicability threshold for BACT and LAER may have excluded smaller sources potentially subject to RACT controls, and technology advances or reductions in control costs may have occurred since the old determination was conducted.

Comment: One commenter recommended that EPA allow States to use information gathered from prior BACT or LAER analyses to complete the RACT determination, as was allowed in the 8-hour ozone NAAQS implementation rule.

Response: The final rule allows for use of such information, to the extent it remains valid, to inform a certification by the State that BACT or LAER technology continues to exceed what would currently be considered RACT.

Comment: Some commenters argued that any MACT determination that controls the pollutants of concern should be more than sufficient to satisfy RACT. Some commenters made similar recommendations regarding specific standards where PM limits were developed as a surrogate for HAPs, such as the MACT standard for integrated iron and steel mills, the MACT standard for iron and steel foundries, and the section 129 standards for waste to energy facilities.

Response: While agreeing that MACT controls are relevant, the EPA disagrees that all MACT determinations should be automatically considered to satisfy RACT. Reasons include: A MACT standard aimed at toxics might not ensure that the relevant $PM_{2.5}$ pollutant(s) are well controlled, MACT applicability provisions might have excluded units potentially subject to RACT, and technology advances or reductions in control costs might have occurred since EPA conducted the MACT analysis. The EPA believes that the State should review whether technology advances have occurred including available ''beyond the MACT floor'' technologies that may be reasonable in the context of RACT for $PM_{2.5}$ nonattainment, but which were not selected as MACT for purposes of implementing section 112. The EPA believes that RACT analyses should evaluate whether increased capture of $PM_{2.5}$ could be achieved, and whether an increased efficiency in controlling the fine fraction of particulate matter is reasonably available. The EPA has, however, added a specific recognition that MACT standards can reduce $PM_{2.5}$ as well as VOC, and that $PM_{2.5}$ information gathered for MACT standards development may inform a State's conclusions on available technologies for direct $PM_{2.5}$ emissions.

Comment: One commenter expressed a concern that EPA should not presume that MACT represents RACT where the MACT rule allows for a risk-based exemption from the control technology requirement.

Response: The EPA agrees with this comment.

11. How Should Condensable Emissions Be Treated in RACT Determinations?

a. Background

Certain commercial or industrial activities involving high temperature processes (fuel combustion, metal processing, cooking operations, etc.) emit gaseous pollutants into the ambient air which rapidly condense into particle form. The constituents of these condensed particles include, but are not limited to, organic material, sulfuric acid, and metals. In general, condensable emissions are taken into account wherever possible in emission factors used to develop national emission inventories, and States are required under the consolidated emissions reporting rule (CERR) [44] to report condensable emissions in each inventory revision. Currently, some States have regulations requiring sources to quantify condensable emissions and to implement control measures for them, and others do not. In 1990, EPA promulgated Method 202 in Appendix M of 40 CFR Part 51 to quantify condensable particulate matter emissions. In the proposed rule, EPA discussed and requested comment on issues related to condensable emissions in RACT determinations.

In the proposed rule, we noted that EPA is in the process of developing detailed guidance on a new test method which quantifies and can be used to characterize the constituents of the $PM_{2.5}$ emissions including both the filterable and condensable portion of the emissions stream. We also noted that when a source implements either of these test methods addressing condensable emissions, the State will likely need to revise the source's emissions limit to account for those emissions that were previously unregulated. For the purposes of determining RACT applicability and establishing RACT emission limits, EPA indicated in the proposal that it intends to require the State to adopt the new test method once EPA issues its detailed guidance. This guidance would be for use by all sources within a $PM_{2.5}$ nonattainment area that are required to reduce emissions as part of the area's attainment strategy.

b. Final Rule

Issues and comments related to test method and emissions limit issues for direct $PM_{2.5}$ for RACT, including discussion of test methods for condensable $PM_{2.5}$, are discussed in section II.L.3 of this preamble. The EPA recognizes that in some cases condensable emissions are more difficult to control than filterable emissions. However, condensable emissions may be assumed to be almost entirely in the 2.5 micrometer range and smaller, so these emissions are inherently more significant for $PM_{2.5}$ than for prior particulate matter standards addressing larger particles. Therefore, EPA encourages States to consider the potential for reducing condensable emissions when evaluating potential measures for RACT.

12. What Criteria Should Be Met To Ensure Effective Regulations To Implement RACT and RACM?

a. Final Rule

After the State has identified a RACT or RACM measure for a particular nonattainment area, it must then implement that measure through a legally enforceable mechanism (e.g., a State rule approved into the SIP). The legally enforceable mechanism must meet four important criteria.

First, the baseline emissions from the source or group of sources and the future year projected emissions must be quantifiable so that the projected emissions reductions from the sources can be attributed to the specific

[44] The consolidated emissions reporting rule was published in the **Federal Register** on June 10, 2002, pages 39602–39616.

measures being implemented. It is important that the emissions from the source category in question are accurately represented in the baseline inventory so that emissions reductions are properly calculated. In particular, it is especially important to ensure that both the filterable and condensable components of $PM_{2.5}$ are accurately represented in the baseline since traditional Federal and State test methods have not included the condensable component of particulate matter emissions and have not required particle sizing of the filterable component.

Second, the control measures must be enforceable. This means that they must specify clear, unambiguous, and measurable requirements. When feasible, the measurable requirements for larger emitting facilities should include periodic source testing to establish the capability of such facilities to achieve the required emission level. Additionally, to verify the continued performance of the control measure, specific monitoring programs appropriate for the type of control measure employed and the level of emissions must be included to verify the continued performance of the control measure. The control measures and monitoring program must also have been adopted according to proper legal procedures.

Third, the measures must be replicable. This means that where a rule contains procedures for interpreting, changing, or determining compliance with the rule, the procedures are sufficiently specific and nonsubjective so that two independent entities applying the procedures would obtain the same result.

Fourth, the control measures must be accountable. This means, for example, that source-specific emission limits must be permanent and must reflect the assumptions used in the SIP demonstration. It also means that the SIP must establish requirements to track emission changes at sources and provide for corrective action if emissions reductions are not achieved according to the plan.

b. Comments and Responses

There were no comments on this section. The language above is very similar to the language in the proposal.

G. Reasonable Further Progress (RFP)

1. Background

Clean Air Act Section 172(c)(2) requires that plans for nonattainment areas ''shall require reasonable further progress,'' which as defined in Section 171(1) ''means such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date.'' This section describes the requirements the Administrator is establishing for states to achieve reasonable further progress.

In general terms, the goal of these RFP requirements is for areas to achieve generally linear progress toward attainment. The RFP requirements were included in the Clean Air Act to assure steady progress toward attaining air quality standards, as opposed to deferring implementation of all measures until the end date by which the standard is to be attained.

2. Requirements for Areas With Attainment Dates of 2010 or Earlier

a. Background

In 40 CFR 51.1009(b)(1) of the proposed rule, EPA proposed that a State which submits an implementation plan that demonstrates that an area will achieve attainment by 2010 (i.e., achieves attainment level emissions during 2009) would not be required to submit a separate reasonable further progress plan for that area. In such cases, EPA proposed that the attainment demonstration would also be considered to demonstrate that the area is achieving RFP.

b. Final Rule

In the final rule, EPA is maintaining the approach described in the proposed rule. An area that demonstrates attainment by 2010 will be considered to have satisfied the RFP requirement and need not submit any additional material to satisfy the RFP requirement. The EPA will view the attainment demonstration as also demonstrating that the area is making reasonable further progress toward attainment.

c. Comments and Responses

Comment: A number of commenters supported EPA's view that a demonstration of attainment by 2010 would also demonstrate that the area is making reasonable further progress toward attainment.

Response: The EPA appreciates the support and is adopting the supported approach.

Comment: A set of commenters objects to EPA's proposal, arguing that EPA cannot waive RFP requirements for areas where the state purports to demonstrate attainment. These commenters believe that Subpart 4 of Part D requires milestones prior to 2009, and these commenters believe that even Subpart 1 requires a demonstration of interim progress that EPA cannot waive.

Response: In brief, EPA is not waiving the RFP requirements for any area. Instead, EPA is concluding that a demonstration of attainment by 2010 also serves to demonstrate achievement of RFP. If the state submittal purports to demonstrate attainment but does not adequately make this demonstration, then the submittal also would not demonstrate achievement of RFP. The nature of the RFP requirement would then depend on whether the remedied attainment demonstration provides for attainment by 2010. Finally, as discussed above, EPA believes that Subpart 4 requirements do not apply to $PM_{2.5}$ plans. More detailed discussion of this comment and EPA's response are provided in the response to comments document.

3. Requirements for Areas With Attainment Dates Beyond 2010

a. Background

The proposed rule required a State to submit an RFP plan along with its attainment demonstration and SIP due in April 2008 for any area for which the State demonstrates that 2011 or later is the most expeditious attainment date. EPA proposed that the 2008 RFP plan must provide adequate emission reductions by 2009[45] and, in some cases, by 2012. The plan must demonstrate that emissions will decline in a manner that represents generally linear progress from the 2002 baseline year to the attainment year.

b. Final Rule

The final rule requires a State to submit an RFP plan along with its attainment demonstration and SIP due in April 2008 for any area for which the State justifies an extension of the attainment date beyond 2010. The RFP plan must provide emission reductions such that emissions in 2009 represent generally linear progress from the 2002 baseline year to the attainment year. Where the State justifies an extension of the attainment deadline to 2014 or 2015, the state must additionally provide emission reductions such that emissions in 2012 represent generally linear progress from the 2002 baseline year to the attainment year.

[45] The RFP test uses inventories for the full year, e.g. the year of 2009 or the year of 2012. EPA does not specifically require that the relevant measures be implemented by the beginning of the year, but RFP inventories must reflect the fact that measures that are implemented later in the year have correspondingly less impact on the year's annual total emissions.

If the State demonstrates that attainment will occur by 2010 or earlier, EPA will consider the attainment demonstration to demonstrate achievement of reasonable further progress, and the State will not be required to submit an additional RFP plan for the area.

c. Comments and Responses

Comment: For areas that demonstrate attainment by 2015 without adopting additional measures, a commenter recommended that the attainment demonstration be viewed as also demonstrating that the area is achieving RFP. The commenter therefore recommended that the state not be required to submit an RFP plan for such an area.

Response: A submittal that demonstrates attainment at the latest allowable date and does not address interim air quality fails to show that the path to attainment will yield interim incremental air quality improvements. States have ample opportunity to adopt measures that would provide interim air quality improvement long before 2015. Indeed, as discussed elsewhere as part of the discussion of attainment dates, a submittal that only addresses 2015 would also fail the attainment demonstration requirement, insofar as it would not be addressing whether attainment is as expeditious as practicable, because the submittal would fail to assess whether attainment could be achieved earlier. Therefore, irrespective of whether additional measures are needed to attain by 2015, the Clean Air Act mandates assessing progress at reasonable interim dates as well as mandating attainment.

4. Generally Linear Progress and Associated Timeline

a. Background

The EPA proposed that states with areas needing an extension of the attainment deadline beyond 2010 would be required to submit a plan demonstrating that emissions would be sufficiently reduced by 2009 to achieve a generally linear incremental improvement in air quality. The notice of proposed rulemaking provided an example calculation for an area with a 2013 attainment date, i.e. an area that achieves attainment level emissions in 2012. (See section III.G.4.b.iv of the proposal, 70 FR 66013.) In this example, the 2009 emissions year represents 7/10 of the period extending from the baseline year of 2002 to the 2012 year of attainment level emissions. Therefore, for this example, EPA's proposed requirement would be for this area to achieve emission reductions by 2009 representing approximately 7/10 of the emission reductions needed to attain the standards. For states with areas needing the attainment deadline extended to 2014 or 2015, EPA proposed to require achievement of generally linear emission reductions at two RFP milestone years—the 2009 and 2012 emission years.

The EPA received several comments on various elements of its proposed approach. Several commenters objected to EPA's proposed requirement to achieve linear progress toward attainment, asserting that EPA cannot reasonably expect states to achieve a significant amount of progress within a short time after plan submittals are due. Some commenters recommended requiring a specific emission reduction percentage, similar to the rate of progress requirement for ozone. These comments are addressed below.

b. Final Rule

The EPA is requiring States with areas needing an extension of the attainment deadline to submit RFP plans. These plans must demonstrate that generally linear reductions in emissions will occur by 2009, i.e. that emissions in 2009 will be reduced to the extent represented by a generally linear progression from 2002 base year emissions to attainment-level emissions. For any area that needs an extension of the attainment deadline to 2014 or 2015, the State's RFP plan would also need to demonstrate that generally linear reductions will be achieved in the 2012 emissions year as well.

c. Comments and Responses

Comment: Several commenters objected to EPA's proposed requirement that states demonstrate linear progress toward attainment. For example, a commenter stated that a ''generally linear reduction process may not be practicable.'' A commenter stated that it ''agrees that areas should be able to take credit for reductions from 2002 forward, [but] EPA should allow for fewer reductions (as opposed to linear reductions) prior to 2008.''

A commenter noted that EPA's ''proposed approach ignores several important realities about PM NAAQS implementation. First, * * * [n]ot until SIP submittal in April 2008, some 6 years after the RFP baseline date, will any local measures be finally adopted and approved. Under [the example EPA provided in its proposed rulemaking], states will be required to play 'catch-up' by achieving 70 percent of the required reductions in 2009. * * * Second, the 'generally linear' approach ignores that EPA intends for states to rely in large part on mobile source reductions and reductions in NO_X and SO_2 from CAIR implementation to achieve attainment in many areas. These measures fail a 'generally linear' test since most of the reductions they provide will not be realized until after 2009.'' This commenter continues that the incremental reductions in emissions required in the Clean Air Act need not be equal increments, that the absence of a specific statutorily mandated increment (such as the 3 percent per year requirement for ozone) allows EPA to be more flexible and to rely more heavily on later reductions. The commenter also argues that EPA's proposal is more stringent than the ozone RFP requirement, insofar as the ozone RFP requirement provides for averaging over 3 years. Similar comments were submitted by other commenters.

Another commenter supported EPA's proposal. This commenter supported requiring demonstrations that areas achieve emission reductions that will yield incremental improvement in air quality on a path toward expeditious attainment.

Response: The EPA believes that the requirement for generally linear reductions is reasonable because it allows States to take credit for early reductions achieved due to federal, State, and local programs. We find that it appropriately implements the RFP requirement in the Clean Air Act. For these reasons, EPA is finalizing the requirement that RFP plans for areas needing an attainment deadline extension show generally linear progress in reducing emissions from the base year through the 2009 emissions year. EPA is also requiring that areas needing an attainment deadline extension to 2014 or 2015 (i.e. attainment level emissions projected to start in 2013 or 2014) show generally linear progress in reducing emissions through the 2012 emissions year.

The commenters objecting to the requirement for generally linear progress appear to be assuming that only minimal emission reductions can be expected before 2008, so that a requirement for generally linear progress would require plans submitted in 2008 to compensate by achieving unrealistically high levels of emission reductions. The EPA disagrees with this assumption.

In fact, substantial emission reductions have occurred in the past few years and can be expected to occur through the 2009 emissions year. The EPA has promulgated significant mobile source rules recently that will yield

substantial benefits in the coming years, and these benefits follow a series of prior rules that provide a steady progression of emission reductions as newer, cleaner vehicles replace older, dirtier vehicles. For utilities, significant NO_X reductions occurred in 2004 under the NO_X SIP call, and substantial SO_2 reductions are expected to occur under the CAIR trading program prior to 2010 due to incentives for early reductions and the banking of allowances.

The EPA has also promulgated many other regulations that will reduce particulate matter and particulate matter precursor emissions before as well as after 2009. States have also been implementing a variety of measures. With use of a 2002 baseline, the assessment of RFP allows credit for these measures. The following is a partial list of the measures that have been adopted and will contribute to achieving generally linear reductions:

- NO_X SIP Call.
- Tightened emission limits for new gasoline and diesel vehicles.
- Numerous regulations requiring Maximum Achievable Control Technology, including regulations for:

—Iron and steel plants, including coke plants
—Industrial boilers
—Cement plants
—Lime plants
—Primary aluminum plants

- Numerous consent decrees for refineries.
- Numerous consent decrees for power plants.
- The Clean Air Interstate Rule for utilities.
- Retrofitted controls on diesel vehicles, and related programs for reducing diesel vehicle emissions.
- Closures of coke plants and other facilities (and, from a national perspective, replacement with cleaner new facilities).

While different control measures require various timelines for implementation, EPA believes that many of the additional measures that states might adopt for attainment planning purposes can be implemented in a timely fashion for addressing RFP requirements. Thus, EPA believes that states can reasonably be expected to assure that the combination of existing measures and additional measures as necessary will provide for generally linear progress in reducing emissions. Furthermore, particularly with respect to the 2009 RFP milestone year, when EPA evaluates whether the emission levels in a state plan represent generally linear progress, EPA will consider the availability of measures that can be implemented by 2009.

It is difficult to compare the stringency of this RFP requirement to the RFP requirement for ozone. The RFP requirement for ozone measures one form of progress that occurs after 3 years, and the requirement for $PM_{2.5}$ measures a different form of progress that occurs after 7 years (and for some areas also after 10 years). That is, the ozone RFP requirement applies a fixed, universally applicable emission reduction percentage for one pollutant (VOC), whereas EPA is defining the $PM_{2.5}$ RFP requirement as an area-specific combination of emission reductions for multiple pollutants, defined on the basis of each area's attainment demonstration.

The EPA believes that the Clean Air Act mandates not merely eventual attainment by 2015 but also that states demonstrate that emissions are being incrementally reduced in earlier years. (As discussed elsewhere, states must also demonstrate attainment by earlier than 2015 if feasible.) The requirement for RFP reflects Congressional intent that areas make steady progress toward attainment in the years before attainment occurs, and states have ample opportunity to assure that reductions occur well before 2015.

Comment: A commenter observes that the $PM_{2.5}$ nonattainment areas in its state also violate the ozone standard. The commenter observes, ''[i]n setting plan requirements, U.S. EPA should choose options that best facilitate harmonization of fine particulate and ozone control programs. This includes using a fixed percentage of emission reductions per year for reasonable further progress (RFP). We recommend the ozone RFP metric of three percent annual emission reductions averaged over three years.'' Another commenter also supports a more prescriptive RFP requirement, and comments that ''As suggested by EPA, nonattainment areas must be required to achieve 'a fixed percentage reduction of the emissions of direct $PM_{2.5}$ and regulated $PM_{2.5}$ precursors and in specific milestone years' between the base year and the attainment year proposed in the attainment demonstration.'' A third commenter supported establishing a requirement for a fixed emission reduction percentage, set at ''no less than the 3 percent rate'' in Section 182, with the possibility of higher rates in areas with more severe air quality problems.

Other commenters prefer the approach that EPA proposed. For example one commenter states that it agrees with EPA's approach of using the attainment demonstration to define the parameters for determining what constitutes RFP, and the commenter supports the flexibility of EPA's proposed approach ''rather than requiring fixed linear percentage reductions.'' Regarding the proposed option to require 3 percent per year emission reductions for areas classified as serious, some commenters recommended against establishing classifications and a fixed emission reduction percentage for any area.

Response: Requiring a fixed annual emission reduction percentage would impose a ''one-size-fits-all'' approach to address a range of circumstances. Requiring a fixed annual emission reduction percentage would overstate the reductions needed to achieve timely attainment in some areas and would understate the reductions needed to achieve timely attainment in other areas. The EPA believes that defining the RFP requirement in terms of achieving generally linear progress toward the emission reductions needed for timely attainment assures that each area will achieve a steady rate of progress most appropriate for the area to achieve timely attainment.

The EPA recognizes that many areas are nonattainment for both $PM_{2.5}$ and ozone and that the control programs for the two pollutants are sufficiently intertwined that harmonization of planning for meeting requirements applicable to the two pollutants is important. However, because the statutory requirements set forth in section 182 do not apply to $PM_{2.5}$ RFP plans, EPA believes it is neither necessary nor appropriate to impose these requirements for $PM_{2.5}$. Indeed, given the multiple pollutants that contribute to $PM_{2.5}$ and the variations that exist in the nature and composition of $PM_{2.5}$ across the country, EPA believes that the $PM_{2.5}$ RFP requirements for generally linear reductions are better defined to reflect these variations and thus better targeted toward the emission reductions that in each area can be expected to lead toward timely attainment. Further, EPA believes that application of a different form of the RFP requirement does not cause conflicts in implementation planning for the two standards. For example, reductions of NO_X emissions will generally reduce concentrations of both ozone and $PM_{2.5}$, and NO_X emission reductions are creditable for meeting both the ozone and the $PM_{2.5}$ RFP requirements.

An important distinction between $PM_{2.5}$ and ozone is that fine particle formation is in general a more complex process, affected by both direct emissions and numerous precursor pollutants. The EPA does not believe

that RFP targets for $PM_{2.5}$ should be the same as those used for the ozone implementation program, nor should the same percentage reduction be used for all $PM_{2.5}$ related pollutants. Instead, EPA believes that RFP plans should reflect an appropriate combination of pollutant reductions that most effectively provides for attainment. Therefore, EPA has defined an RFP requirement in which target emission reductions are established in conjunction with the area's attainment plan.

5. Geographic Coverage of Emissions Sources

a. Background

$PM_{2.5}$ concentrations reflect a combination of impacts over a wide range of geographic scales. For some components of $PM_{2.5}$, observed concentrations typically arise predominantly from sources within the nonattainment area. For other components, $PM_{2.5}$ concentrations may be influenced by sources across a broad area extending outside the nonattainment area. The EPA's intent is to define the RFP requirement in terms of emissions reductions that can be expected to provide generally linear improvements in air quality in the nonattainment area. For this purpose, EPA continues to believe that RFP requirements for $PM_{2.5}$ are best defined such that states evaluate emissions of each pollutant throughout the area in which the emissions substantially influence $PM_{2.5}$ concentrations in the nonattainment area.

As described in the proposed rulemaking, EPA expects each area's attainment demonstration to identify many of the parameters used to define the emission reductions that would represent RFP. First, the attainment plan will identify the pollutants that are being reduced to achieve attainment. Second, the attainment plan will identify the amount of reduction of each pollutant and the date by which attainment can be achieved. This information suffices to calculate a baseline set of reductions to be achieved by 2009 to provide for RFP. Third, where a state chooses to achieve RFP by reducing some pollutants earlier than others, the attainment plan will provide the information needed to assess whether the intended set of reductions can be expected to provide a comparable level of air quality improvement. Fourth, if the State intends to include emissions sources located outside the nonattainment area in its RFP plan, the information necessary to justify inclusion of such sources will likely be found in the attainment plan.

The EPA's proposed rulemaking identified several expectations regarding regional versus local impacts. For directly emitted $PM_{2.5}$ (including organic and other carbonaceous particles as well as miscellaneous inorganic particles and including condensable particulate matter), EPA recognized that impacts are commonly localized, and that direct emissions of $PM_{2.5}$ outside the nonattainment area should not be included in the RFP plan. Conversely, EPA recognized the regional nature of secondarily-formed sulfate and nitrate, and proposed that states could justify inclusion in the RFP plan of SO_2 and NO_X emissions sources located within 200 kilometers of the nonattainment area.

The EPA recognizes that fine particles travel over long distances, and that distant emissions of SO_2 and NO_X emissions can influence a nonattainment area's air quality. At the same time, distant sources can be expected to have less impact than sources closer to the nonattainment area. EPA's procedures for assessing RFP rely on a general assumption that all the sources included in the assessment have a comparable impact per ton of emissions. For this reason, it would be inappropriate to include distant emission sources in the assessment. Indeed, limiting the consideration of SO_2 and NO_X emissions to a 200 kilometer range is intended to assure that only sources with comparable impacts are included in the assessment.

b. Final Policy

The policy for addressing direct $PM_{2.5}$ emissions in RFP plans remains unchanged from the proposal: only emissions from within the nonattainment area may be included. Conversely, for SO_2 and NO_X, EPA believes that states could be able to justify considering not only all emissions in the nonattainment area but also emissions within a distance that may be up to 200 kilometers from the nonattainment area. States may also be able to justify consideration of VOC and ammonia emissions outside the nonattainment area on a case-by-case basis. As we explain more fully below in responding to comments, in situations where the state demonstrates that VOCs are a significant contributor to $PM_{2.5}$ concentrations in the area, it may be appropriate to include VOC emission sources within a distance of up to 100 kilometers of the nonattainment area. Given the uncertainties regarding ammonia emission inventories and the effects of reducing ammonia, EPA is not establishing a policy on this issue with respect to ammonia. States that expect to regulate ammonia should consult with their regional offices to determine appropriate approaches for those areas. The justification for considering emissions outside the nonattainment area shall include justification of the state's recommended definition of the area used in the RFP plan for each pollutant.

The EPA received comments objecting to the possibility that RFP inventories for areas outside the nonattainment area could include selected sources expecting substantial emission reductions while excluding other nearby sources expecting emission increases. Based on its review of these comments, EPA is revising its approach for considering regional emissions. If the state justifies consideration of precursor emissions for an area outside the nonattainment area, EPA will expect state RFP assessments to reflect emissions changes from all sources in this area. The State cannot include only selected sources providing emission reductions in the analysis. The inventories for 2002, 2009, 2012 (where applicable) and the attainment year would all reflect the same source domain (i.e. the same set of sources except for the addition of any known new sources or removal of known, creditably and permanently shut down sources).

In cases where the state justifies consideration of emissions of specified precursors from outside the nonattainment area, the state must provide separate information regarding on-road mobile source emissions within the nonattainment area for transportation conformity purposes. The EPA's transportation conformity regulations (40 CFR Part 93.102(b)) only require conformity determinations in nonattainment and maintenance areas, and these regulations rely on SIP on-road motor vehicle emission budgets that address the designated boundary of the nonattainment area. For this reason, if the state addresses emissions outside the nonattainment area for a pertinent precursor (i.e. a precursor for which mobile sources are significant, as discussed in the May 6, 2005 transportation conformity rule on $PM_{2.5}$ precursors at 72 FR 24280), the on-road mobile source component of the RFP inventory will not satisfy the requirements for establishing a SIP budget for transportation conformity purposes.

In such a case, the state must supplement the RFP inventory with an

inventory of onroad mobile source emissions to be used to establish a motor vehicle emissions budget for transportation conformity purposes. This inventory must address on-road motor vehicle emissions that occur within the designated nonattainment area, must be provided for the same milestone year or years as the RFP demonstration (i.e. 2009 and 2012 as applicable), and must satisfy other applicable requirements of the transportation conformity regulations. So long as the state provides this separate emissions budget EPA believes that this approach will optimally address both the RFP and the transportation conformity provisions of the Act.

The EPA is restricting the geographic area for RFP assessments to include only areas within the state or states represented in the nonattainment area. For a single state nonattainment area, only emissions within that state would be considered, even if other states may be within 200 kilometers of the nonattainment area. For multi-state nonattainment areas, only regions within states represented in the nonattainment area shall be included in the RFP assessment. This restriction is intended to address commenters' concerns about the enforceability of emission reductions included in the RFP assessment and helps assure accountability for these reductions. This topic is discussed further in the discussion below about multi-state nonattainment areas.

The EPA is retaining the approach that RFP assessments may not include direct $PM_{2.5}$ emissions from sources outside the nonattainment area. If a State regulates VOC or ammonia emissions as part of its attainment strategy, the RFP plan must include emissions of these pollutants. In the event that a State technical demonstration indicates that emissions of VOC or ammonia from sources outside the nonattainment area contribute significantly to $PM_{2.5}$ concentrations in the nonattainment area, EPA will consider on a case-by-case basis whether it would be appropriate to include emissions from such sources in the RFP plan.

c. Comments and Responses

The EPA received numerous comments on its proposal regarding how regional versus local impacts would be addressed. Multiple commenters objected to EPA's proposal that states could consider sources reducing emissions but ignore neighboring sources increasing emissions. Other commenters recommended that EPA support granting credit for reductions of direct $PM_{2.5}$ emissions that occur outside nonattainment areas. A few commenters also recommended different treatment of selected pollutants.

Comment: Several commenters object to the methods by which EPA proposed to account for reductions outside the nonattainment area. According to a set of commenters, if indeed sources outside the nonattainment area contribute to nonattainment, ''then EPA cannot lawfully or rationally allow the state to claim RFP credit from a single source's reductions without including in the baseline emissions from all sources (mobile, area and stationary) within the same distance from the nonattainment area, and without calculating the impacts of increases and decreases in such emissions on RFP. Viewing reductions from a single 'outside the area' source in isolation will invariably provide an incomplete and inaccurate picture of the actual increase or decrease in emissions contribution to the nonattainment area from all 'outside the area' sources. Moreover, EPA's proposal creates numerous opportunities to game and undermine the system. By allowing nonattainment areas to rely on RFP reductions made outside the nonattainment area, the proposed rule strays from the Act's focus on achieving emissions reductions from sources within the nonattainment area.'' Another commenter insisted that states should not be allowed to consider emissions from sources outside the area unless they can demonstrate the impacts of these sources on nonattainment area concentrations.

In addition, a commenter objects to consideration only of sources that are reducing emissions and recommends that EPA allow credit for upwind source reductions only ''on the condition that all other major sources in the 200 kilometer boundary are also not allowed to increase emissions.'' Another commenter supports an option which states would only consider emissions within the nonattainment area, observing that to consider emissions outside the nonattainment area would be difficult to administer and might inappropriately ''dilute the reductions needed in the nonattainment area.'' This commenter also observes that a 200 kilometer limit does not include much of the emissions that yield long range transport. Another commenter supports crediting reductions outside the nonattainment area but requests that EPA define the area to be considered.

Response: The EPA agrees that examining emissions reductions of only selected sources outside the nonattainment area gives an inaccurate assessment of the progress that an area is making. For example, if a state took credit for emission reductions at Source A but ignored equal emission increases at neighboring Source B, the state would claim emission reductions in its RFP plan when in fact no net emission reductions had occurred.

The commenters suggest various remedies for this problem. One suggestion is to include all sources within the area that is used. Another suggestion is to allow no consideration of emissions outside the nonattainment area. Yet another suggestion is to allow consideration of selected sources so long as other sources do not increase emissions.

The EPA is adopting the first of these suggestions: for the pertinent area outside the nonattainment area, the RFP assessment must include emissions (for all years evaluated) for all sources. The EPA believes that inclusion of all sources is needed to ensure that the RFP plan reflects the actual net emissions changes that are occurring in the relevant area.

In cases where the state justifies consideration of emissions of specified precursors from outside the nonattainment area, EPA is accepting the recommendation of various commenters that the inventories of these precursors used for RFP purposes shall include mobile source emissions as well as stationary and area source emissions. However, in cases where onroad mobile source emissions are significant and are therefore included, the state would need to submit additional information for transportation conformity purposes. As discussed above, in accordance with existing transportation conformity regulations (40 CFR Part 93), the SIP's motor vehicle emissions budget(s) must reflect an emissions inventory of on-road mobile source emissions for the nonattainment area. Consequently, in these cases, the state would need to supplement its RFP inventory with information identifying the inventory of on-road mobile source emissions within the nonattainment area for the pertinent precursor(s) for the applicable year or years (i.e. 2009 and potentially 2012) to be used to establish a motor vehicle emissions budget for transportation conformity purposes.

The relevant comments in general did not address the dimensions of spatial domain of the sources outside the nonattainment area that would be used in assessing RFP. EPA agrees with a commenter urging, as a prerequisite to including sources of the pertinent pollutants outside the nonattainment

area in the assessment, that states must justify the inclusion of sources outside the nonattainment area. This justification would need to demonstrate that these emissions have a substantial impact on nonattainment concentrations that warrants including these emissions along with nonattainment area emissions in assessing RFP. Another commenter recommends that EPA define the area to be included. Since the demonstrations of impact are best done by states, in conjunction with their attainment planning, EPA intends to allow States to justify the area to be included, within distance limits discussed above.

Comment: Numerous commenters recommend that EPA allow credit for reductions of direct $PM_{2.5}$ emissions outside the nonattainment area. Some of these commenters also recommend that EPA allow credit for mobile source emission reductions outside the nonattainment area. Other commenters support EPA's proposed approach, in which states may justify considering precursor emissions outside the nonattainment area but must evaluate direct $PM_{2.5}$ emissions based solely on emissions within the nonattainment area.

Response: Under Section 107 of the Clean Air Act, EPA is to designate nonattainment areas that include areas nearby to the violations that contribute to the violations. Given the spatial scale of the impacts of direct $PM_{2.5}$ emissions, EPA believes that any direct $PM_{2.5}$ emission source that demonstrably influences nonattainment area violations (and thus would contribute to these violations) would also be considered to be nearby to the violations for designation purposes. The EPA believes that it has properly defined the nonattainment areas to include all nearby contributing sources. Nevertheless, EPA asks anyone with evidence that an additional source or source area contributes to violations in a nonattainment area to submit that information to EPA and to recommend incorporation of that source or source area into the nonattainment area.

The EPA has commented on consideration of mobile source emissions above. For direct $PM_{2.5}$ emissions, EPA believes that the nonattainment area properly defines the area of consideration, and emissions from mobile sources outside the nonattainment area, like emissions from stationary sources outside the nonattainment area, should not be considered. For precursors for which consideration of emissions outside the nonattainment area is justified, the applicable inventories would include emissions from all sources including mobile sources as well as stationary sources.

Comment: A commenter states that ''RFP credits for VOC should be granted for reductions achieved within the nonattainment area as well as [within] geographical limits outside of the nonattainment area.'' This commenter supports consistency with the ozone policy, which allows credit for NO_X reductions within 200 kilometers and VOC reductions within 100 kilometers of the nonattainment area. Another commenter makes similar comments regarding VOC and comments that ''[a]s the science and understanding of $PM_{2.5}$ formation increases, EPA must revisit the 200 kilometer parameter and develop a possible proposal for ammonia.''

Response: Conceptually, EPA agrees that in areas where anthropogenic VOC emissions outside the nonattainment area are shown to be a significant contributor to nonattainment area $PM_{2.5}$ concentrations, presumably by formation of organic particles that influence nonattainment area concentrations, reduction of these VOC emissions could help improve air quality in the nonattainment area. Therefore, EPA is revising its policy to accommodate consideration of these potential impacts. The EPA believes that as the impacts of anthropogenic VOC on $PM_{2.5}$ concentrations are better understood, it may in some cases be appropriate to consider sources outside the nonattainment area in RFP plans if the impacts from such sources can be properly quantified and justified.

Nevertheless, EPA must highlight the technical challenges involved in assessing the impacts of VOC emission reductions. First, it is essential that the impacts of secondary organic particle formation from anthropogenic VOC emissions be differentiated from the impacts caused by biogenic VOC emissions and from the impacts of direct organic particle emissions. Second, the process of organic particle formation is highly complex, and currently available atmospheric models typically perform poorly in assessing the mass of particles thus formed. Third, the distance range of impacts, and to be more precise the distance range over which source impacts are comparable, is especially uncertain. While the distance range for organic particle formation is not necessarily the same as for the influence of VOC on ozone formation, it may be appropriate to include sources within 100 kilometers of the nonattainment area for both purposes, as the commenter recommended. However, any state wishing to include such sources outside the nonattainment area must justify the distance range that is appropriate for the area.

The EPA is not prepared at this time to establish generally applicable guidance with respect to how RFP plans should address ammonia in cases where that precursor is found to be significant. States that expect to regulate ammonia emissions should consult their regional office regarding appropriate approaches for their particular areas.

Finally, EPA agrees with the commenter that EPA should revisit the range of issues regarding geographic distances of impacts as more information and understanding become available.

6. Pollutants To Be Addressed in the RFP Plan

a. Background

A number of commenters appeared to be confused by the discussion in the notice of proposed rulemaking regarding the pollutants to be included in the RFP assessment. The EPA proposed that the attainment demonstration would provide the key parameters of the RFP demonstration, and that the list of pollutants to be addressed in the RFP demonstration would match the list of pollutants regulated as part of the attainment demonstration. However, the notice of proposed rulemaking also suggested that the presumptions regarding whether different pollutants are to be regulated under NSR and RACM (including RACT) would also apply to RFP. This led some commenters to recommend different treatment of specific pollutants.

In fact, the presumptions of applicability that EPA is promulgating for RACM are not germane to RFP. The pollutant coverage of RFP assessments is determined on an area-specific basis according to each area's attainment demonstration, and EPA need not establish presumptions as to what pollutants are included in the RFP assessment. For example, if a state includes no NO_X emission reductions in its attainment plan, then the RFP plan would not include NO_X, irrespective of whether the (uncontrolled) NO_X emissions contribute significantly to the areas $PM_{2.5}$ concentrations.

The contrast between establishment of presumptions for RACM and having no such presumptions for RFP (or for attainment demonstrations) reflects differences in regulatory context. For RACM, at issue is whether the impact of the pollutant is sufficient to warrant full implementation of the RACM requirements. In contrast, for RFP (as for attainment plans), EPA is establishing

an overall progress requirement that may be met by applying various control levels to various pollutants, so long as overall emission reductions are adequate. Indeed, if the state chooses not to control a particular pollutant in its attainment plan, then the presumption is that that pollutant would not be reduced in the RFP plan either. Furthermore, states have the flexibility to meet the overall progress with any adequate combination of control of relevant pollutants, regardless of the significance or insignificance of these pollutants' impacts. For these reasons, EPA is making no presumptions as to what pollutants will be included in RFP plans.

b. Final Policy

As proposed, the pollutants to be addressed in the RFP plan are those pollutants that are subject to control measures in the attainment plan.

c. Comments and Responses

Comment: A commenter states that ''VOC should be considered a presumptive $PM_{2.5}$ precursor.'' Another commenter recommends presuming that VOC and ammonia are included in the RFP plan.

Response: The EPA's approach to RFP does not rely on presumptions as to whether a pollutant does or does not warrant regulation as a precursor. Instead, pollutants are to be included or excluded according to whether the attainment demonstration includes emission controls for the pollutant that yield quantitative air quality benefits. Thus, irrespective of the presumptions applicable to RACM, the RFP plan would not include VOC unless the attainment plan reflects air quality improvements from VOC emission controls. The challenges of addressing VOC as part of an RFP plan were discussed earlier in this section. Similarly, ammonia would not be included in the RFP plan if the attainment plan does not regulate ammonia emissions.

7. Equivalent Air Quality Improvement

a. Background

The EPA proposed that states could use alternative combinations of various types of emission control programs to meet RFP requirements if the alternative would be expected provide air quality improvements that are approximately equivalent to those of the benchmark emission reductions. Some control programs for some pollutants can be implemented more quickly than other control programs. EPA believes that it is unnecessary to require that all pollutants be reduced at the same rate or by the same fraction of the ultimate attainment plan reductions. The EPA believes instead that the states should have flexibility to ''mix and match'' control strategies, so long as they provide a demonstration that the adopted approach can be expected to yield approximately the same air quality progress as an approach in which the state achieves an identical fraction of the attainment strategy for all pollutants by the RFP milestone date.

The notice of proposed rulemaking presented examples of the assessment of RFP, illustrating EPA's recommended approach for establishing a benchmark set of emission reductions and illustrating EPA's recommended procedures for whether modified approaches that control some pollutants earlier than other pollutants may be considered equivalent. While not repeated here, the examples remain appropriate for describing the approach included in the final rule. (See 70 FR 66012–66013).

Most commenters supported EPA's proposal to allow alternative combinations of control that can be shown by simple means to be equivalent. A set of commenters objected to this approach, given the uncertainties involved in the equivalency assessment. Nevertheless, for this aspect of RFP policy, EPA's final policy reflects the policy that it proposed.

b. Final Policy

The EPA is adopting an approach that establishes a benchmark level of controls but allows states the flexibility to adopt any combination of controls of the various pollutants that can be shown to provide equivalent benefits using procedures that EPA is recommending (or at the State's option, air quality modeling). The first step is to determine the ratio of the number of years from the baseline year to the RFP review year (e.g., the 7 years from 2002 to 2009) divided by the number of years from the baseline year to the year in which attainment level emissions are achieved (e.g. the 10 years from 2002 to 2012, for an area with a 2013 attainment deadline). The benchmark level of controls is then determined by multiplying this ratio times the level of control being achieved for each pollutant. For example, for an area with an attainment deadline extended to 2013, the benchmark level of controls would reflect 7/10 of the emission reductions of each pollutant that is controlled in the attainment plan.

The equivalency process involves consideration of the air quality benefits for the emission reductions in the alternative plan for each regulated pollutant. In effect, the air quality benefits for each pollutant are used as weighting factors, such that pollutants for which controls yield larger benefits are weighted more heavily in determining the adequacy of the resulting plan. For each pollutant, the first step is to find the ratio of the emission reductions achieved by the RFP milestone date (e.g. the emission reductions achieved between 2002 and 2009) divided by the emission reductions achieved by the attainment date. The second step is to multiply this ratio times the air quality improvement attributable to full implementation in the attainment year of the attainment strategy relevant to that pollutant. The third step is to add these pollutant-specific results to obtain a total estimated air quality benefit of the alternative plan.

The air quality benefits of the benchmark reductions are easier to determine. The first step, inherent to defining the benchmark reductions, is to determine the ratio of the number of years to the RFP review divided by the number of years to attainment level emissions (in the example above, 7/10). The second step is simply to multiply this ratio times the quantity of air quality improvement achieved by the attainment plan. (Conceptually, the calculations are the same as are done for the alternative plan, but the mathematics are simpler because one is applying the same assumed fraction of the attainment plan emission reductions (e.g. 7/10) for all pollutants, so that there is no need to subdivide by pollutant.) For each milestone date, any alternative that provides estimated air quality benefits by the RFP milestone date that at a minimum are generally equivalent to the estimated benefits of the benchmark level of emission reductions will be considered to satisfy RFP requirements.

c. Comments and Responses

Comment: A set of commenters argues that the equivalency process is too uncertain, and recommends instead that states be required to achieve at least a fixed percentage reduction for all pollutants. The commenters cite the uncertainties acknowledged by EPA, including potential nonlinearity (i.e. that a given percentage of an emission reduction may yield a different percentage of the related air quality benefit). The commenters contrast EPA's willingness to accommodate these uncertainties, for purposes of giving states flexibility for alternate RFP plan designs, with EPA's unwillingness to accommodate the uncertainties inherent

in regulating ammonia emissions. The commenters state that ''Rather than propose a standardized process for coherently determining 'equivalency,' EPA embraces the possibility that States will invent multiple and disparate methodologies.'' The commenters argue that the need for certainty in achieving emission reductions trumps the benefits of state flexibility, not the other way around. The commenters state that if ''EPA decides nonetheless to accept equivalency demonstrations, it should at least * * * require States to conduct dispersion modeling'' to confirm equivalency. The commenters further find unlawful the fact that EPA would allow ''rough equivalency'' rather than full equivalency to the benchmark approach. The commenters would prefer that EPA required a fixed percentage reduction of the emissions of direct $PM_{2.5}$ emissions and of each precursor.

Response: The EPA believes that its proposed approach satisfies the intent of the RFP requirement, which is to make ongoing, steady progress toward attainment rather than backloading control strategies. A requirement to obtain at least a given percentage of each of the pollutants that contribute to $PM_{2.5}$ concentrations would impose an inflexibility that EPA concludes is unnecessary where not required by the statute. The EPA proposed to require that areas achieve emission reductions that are generally linear, and a plan that provides for rough equivalency to the benchmark approach would indeed provide generally linear reductions. In response to commenters' requests for a standardized process for assessing equivalency, EPA believes the process outlined in the final rule is responsive to this request. It is not clear whether the fixed reduction percentage that certain commenters recommended would be an area-specific percentage (such as EPA uses to define the benchmark approach) or a universally applicable percentage (such as 3 percent per year). If the former, then EPA would repeat the response above regarding flexibility being consistent with the Act's requirements; if the latter, then responses in III.6.4 regarding a fixed reduction percentage apply. The EPA believes that the procedures it is establishing to assess equivalency are adequate for assessing RFP and that dispersion modeling need not be required for this purpose.

8. Other RFP Issues

a. Multi-State Nonattainment Areas

As stated in the proposed rulemaking, EPA seeks to ensure that nonattainment areas that include more than one State meet RFP requirements as a whole. Some commenters expressed concern about how one state's submittal should address emissions in other states, including how the state might address questions about the enforceability of another state's requirements.

The issues here resemble the issues for attainment demonstrations. In that context as well, EPA seeks plans that reflect active consultation by the affected states and provide a combination of reductions that are enforceable by the respective states that collectively provide for attainment. The active involvement of regional planning organizations helps assure a collective design of a plan with specific requirements to be adopted by specific states. Likewise for RFP, EPA would expect states with multi-state nonattainment areas to consult with other involved states, to formulate a list of the measures that they will adopt and the measures that the other state(s) will adopt, and then to adopt their list of measures under the assumption that the other state(s) will adopt their listed measures. That is, each state would be responsible for adopting and thereby providing for enforcement of its list of measures, and then that state and ultimately EPA (at such time as the plan is approved) would be responsible for assuring compliance with the SIP requirements.

In accordance with this view of RFP, as is the case for attainment plans, EPA expects states sharing a multi-state nonattainment area to submit a common assessment of whether RFP will occur. As a default, if the assessment only includes emissions within the nonattainment area, then each state would submit an assessment based on emissions from the full nonattainment area including portions of the area in other states. If the assessment includes precursor emissions from additional area outside the nonattainment area, then the states should have a common rationale for the area included, and all affected states would use the same inventory of the same multi-state area thus defined in assessing whether RFP will occur. The EPA would judge such submittals based on (1) whether the overall projected emission reductions will achieve RFP and (2) whether the submitting state has adopted the necessary enforceable measures to assure that the reductions projected within its boundaries will in fact occur.

As a point of clarification, even if a state justifies consideration of emissions outside the nonattainment area in its RFP assessment, EPA intends that these assessments not use emissions from outside the state or states represented in the nonattainment area. For single state nonattainment areas, only emissions within that state would be considered. This will help assure accountability for the emission reductions included in the plan.

b. Tribal Areas

The EPA received no comments on its proposed policy regarding RFP for tribal areas, and EPA is finalizing the proposed policy. Under its Tribal Authority Rule (40 CFR 49.4), EPA found that it was not appropriate to apply SIP schedule requirements to tribes. For similar reasons, EPA is not requiring tribes to submit RFP plans. Generally this exemption will have limited if any impact on the achievement of RFP by an area. Nevertheless, consistent with its general role in implementing programs for tribes where ''necessary and appropriate,'' EPA will work with the affected tribes and states to ensure that emissions on tribal lands are addressed appropriately. The EPA intends to ensure that areas that include both state and tribal lands will satisfy RFP on a collective basis, similar to the policy applicable to multi-state nonattainment areas.

9. Mid-Course Review

a. Background

The EPA proposed requiring mid-course reviews on a case-by-case basis. The proposal described a mid-course review as a combination of reviews aimed at assessing whether a nonattainment area is or is not making sufficient progress toward attainment of the $PM_{2.5}$ standards. The proposal described the mid-course review as involving ''three basic steps: (1) Demonstrate whether the appropriate emission limits and emission reduction programs that were approved as part of the original attainment demonstration and SIP submittal were adopted and implemented; (2) analyze available air quality, meteorology, emissions and modeling data and document relevant findings; and (3) document conclusions regarding whether progress toward attainment is being made using a weight of evidence determination.'' (Cf. 70 FR 66010)

The EPA views mid-course review requirements as part of a set of requirements for implementing the Clean Air Act requirements for reasonable further progress. For areas that demonstrate attainment by April 5, 2010, EPA believes that this attainment demonstration also demonstrates that reasonable further progress is being achieved. For areas that demonstrate

attainment after April 5, 2010, EPA is requiring states to submit an RFP plan, due on April 5, 2008, showing that emissions in 2009 and, in some cases, in 2012, will be sufficiently reduced to provide generally linear progress toward levels that are expected to yield attainment. At issue here is how then to conduct ongoing tracking of whether the planned progress toward attainment is in fact occurring. Subparts 2 (for ozone) and 4 (for PM_{10}) include explicit requirements for ongoing milestone tracking. Since Subpart 1 (applicable for $PM_{2.5}$) allows EPA flexibility in determining how ongoing progress is to be tracked, EPA may adopt other approaches for achieving the necessary assurances that ongoing progress toward attainment is occurring.

Milestone reviews can be confounded by changes in inventory methods (a concern expressed by a commenter particularly with respect to condensable emissions) and involve lengthy delays while inventories are compiled before planning can begin. Other approaches involving only air quality data reviews also do not provide for timely planning, insofar as such approaches involve waiting for three years of air quality data after implementation of controls before planning can begin. The EPA believes that a mid-course review provides the most productive approach, in lieu of establishing milestone tracking or other requirements, to assure that reasonable further progress in reducing emissions is being achieved. For this reason EPA proposed a requirement for mid-course reviews.

The EPA proposed a process for establishing and implementing mid-course review. After the state submits an attainment plan (due in April 2008), EPA would evaluate whether a mid-course review is warranted after considering various factors including factors identified in the proposal. The EPA did not propose to conduct further rulemaking on establishing this requirement, but EPA proposed that ''[w]here EPA finds that a MCR would be required, the approval of the [attainment] demonstration would be contingent on a commitment from the State to conduct the MCR.'' The mid-course review would then be due April 2010. The EPA's proposal also stated that ''EPA would determine [based on review of the mid-course review] whether additional emissions reductions are necessary,'' so that states would need to complete the mid-course review ''three or more years before the applicable attainment date to ensure that any additional controls that may be needed can be adopted [in timely fashion].'' Finally, EPA stated ''[i]f a mid-course review will be required for certain $PM_{2.5}$ nonattainment areas, separate $PM_{2.5}$ mid-course review guidance will be written to address the specific requirements of $PM_{2.5}$ nonattainment areas.''

The EPA received numerous comments objecting to EPA's proposed approach. Several commenters noted the inconsistency between requiring a mid-course review in April 2010 versus requiring a mid-course review due 3 or more years before an attainment date of 2012 or earlier. Multiple commenters objected to EPA requiring a mid-course review only 2 years after the initial attainment plan is due. A commenter requested ''nationally applicable guidance on when an MCR would be required and what it would need to include.'' No commenters supported EPA's timeline for mid-course reviews.

Based on the comments that EPA received, EPA has reevaluated the process for mid-course reviews. Upon reevaluation, EPA shares many of the concerns expressed by commenters about the proposal. The proposal indeed presents conflicting dates for submittal. The EPA agrees that a deadline just 2 years after the initial SIP submittal is too soon for states to conduct meaningful analyses of whether areas are making progress towards attainment. This problem would be exacerbated by the proposed process, in particular the fact that states would not know to begin work on a mid-course review until after they had submitted their initial SIP and after EPA had sufficiently reviewed the submittal to determine the need for a mid-course review. An early mid-course review also would defeat one of the purposes of the mid-course review, which is to take advantage of advances in the science and understanding of the nature of condensables and other components of $PM_{2.5}$, to adjust plans to be better targeted at solving problems. For these reasons, EPA is significantly revising its approach to mid-course reviews as recommended by the commenters. The EPA is establishing a rule which provides more certainty to the states as to applicability and content of mid-course review requirements, thereby avoiding the need for future EPA rulemakings on the subject. The EPA's rule clearly does not require states with early attainment dates to conduct a mid-course review and would clearly mandate a mid-course review only for areas with later attainment dates. The EPA's final rule clarifies the content of mid-course reviews and provides for states to make decisions on whether further controls are needed rather than having EPA make this determination. The mid-course review shall include an updated modeled attainment demonstration as well as a review of the implementation of measures in the April 2008 SIP and a review of recent air quality data. The EPA believes that all of these elements are necessary and should be sufficient for the state to identify whether additional measures are needed to achieve attainment by the attainment date in the approved plan. The EPA believes that states, not EPA, should make the initial determination as to whether additional measures are needed, and EPA has designed its mid-course review requirements to provide for the states to make this determination.

The EPA is promulgating a fixed date of April 2011 as a date for submittal of mid-course reviews for areas with attainment dates in 2014 or 2015. This fixed date will facilitate joint planning for multiple areas to apply common assumptions regarding regional transport. This date also gives states adequate notice for preparing these reviews and adequate time after the April 2008 submittal to incorporate new information and understanding of $PM_{2.5}$ nonattainment problems to adjust attainment strategies as appropriate.

The EPA is not requiring areas demonstrating attainment by 2013 or before to conduct a mid-course review. Such areas plan to have attainment level emissions by 2012, and EPA believes that an April 2011 mid-course review would not provide a timely reassessment of such areas' attainment plans. Instead, EPA is clarifying that mid-course reviews are only required for areas that demonstrate a need for an attainment date extension at least to April 2014.

b. Final Rule

For each area with an approved attainment date in 2014 or 2015, EPA is requiring the state to submit a mid-course review by April 2011. The mid-course review shall include an updated attainment demonstration as well as a review of the implementation status of measures included in the April 2008 submittal and a review of recent air quality data. The state shall determine whether additional measures are needed for timely attainment, just as the state is responsible for determining whether additional measures are needed in the April 2008 attainment demonstration, subject to formal EPA SIP review. The EPA is not requiring RFP milestone reviews, and EPA is requiring mid-course reviews for areas with sufficiently extended attainment dates in lieu of any other form of tracking reasonable progress.

c. Comments and Responses

Comment: A number of commenters objected to EPA's proposed timeframe that would have areas submit a mid-course review only 2 years after the initial SIP is due. They recommended, instead, that areas with attainment dates 2 years or more beyond the first 5-year period submit mid-course reviews 3 years after the SIPs are due (April 2011) and every 3 years thereafter, if necessary. Their reason for this suggestion is that the timing of mid-course review requirements needs to be clearer and should allow adequate time between plans and mid-course reviews if they are to serve as meaningful reviews.

Several commenters also noted an inconsistency in the timing of mid-course review requirements under EPA's proposal. The EPA proposed that mid-course review submittals would be due 5 years after the initial designation, which for all the original designations means 5 years after April 2005, i.e. April 2010. However, EPA also proposed that mid-course reviews would be due 3 years before the attainment date, which for areas with an April 2012 attainment date means April 2009. The commenters considered April 2009 for a mid-course review submittal to be too soon after the initial SIP submittal in April 2008, arguing that EPA would not have had time to review the 2008 SIP submittal, and the states would not have time to prepare a mid-course review by 2009. Some of these commenters expressed a view that EPA should not require mid-course reviews earlier than 3 years after the SIP submittal date.

Response: The EPA agrees with these comments. The EPA is remedying the inconsistency in submittal dates by establishing the single submittal due date of April 2011 that was recommended by the commenters. As requested by commenters, EPA is also clarifying the applicability of the mid-course review requirement. The requirement shall apply to areas with attainment dates of 2014 or 2015; mid-course reviews shall not be required for areas that are expected to attain the standards by 2013.

Comment: A commenter supports mid-course reviews as a means of assuring that areas with longer-term compliance dates are on track to attain the NAAQS as expeditiously as practicable.

Response: The EPA agrees that mid-course reviews can be a critical step in assuring expeditious attainment for areas with extended attainment dates. Indeed, EPA is relying on mid-course reviews rather than milestone reviews or other forms of RFP tracking to serve this purpose.

Comment: A commenter recommended eliminating mid-course review requirements for any area with less than seven years between SIP submittal and attainment. The commenter urged that EPA carefully reconsider its overall timelines for $PM_{2.5}$ while considering the feasibility and practical usefulness of the steps required of States and emission sources.

Response: The EPA agrees that the proposed timeline potentially required mid-course reviews in areas where such reviews would not be warranted, and the timeline did not provide the clarity as to the applicability of the requirement that states need to fulfill their planning responsibilities. In response, EPA is not requiring mid-course reviews for areas demonstrating attainment prior to 2014. For those areas that cannot demonstrate that attainment will occur prior to 2014, EPA has streamlined the mid-course review process so that the state bears responsibility for making the initial determination as to whether additional measures are needed to achieve timely attainment, rather than requiring additional steps of EPA rulemaking and initial findings by EPA as to the level of controls needed in the state's SIP. With the revised timetable, states can be assured of a meaningful mid-course review effort that focuses on the areas that particularly warrant such a review and for which time is available for a productive assessment of the need for additional measures.

Comment: One commenter stated that the proposal that allows the Agency to determine whether or not a State needs to submit a mid-course review with their attainment demonstration on a case-by-case basis lacks sufficient information. Since these attainment demonstrations must meet rigorous criteria, and require substantial work by the States, the commenter is concerned that the proposal neglects to outline the criteria EPA will use to make the case-by-case mid-course review determinations. The commenter asks that EPA provide the States with nationally applicable guidance on when an MCR would be required and what it would need to include.

Response: The EPA agrees with this comment. In particular, EPA agrees that establishing clear criteria for applicability and content of a mid-course review requirement will provide states the opportunity to plan for these reviews and conduct appropriate reviews in a timely fashion. Therefore, this final rule is establishing specific criteria for the applicability of the mid-course review requirement, namely that a mid-course review shall be conducted for any area that cannot demonstrate attainment before 2014. This final rule is also identifying the necessary elements of this mid-course review, i.e. a review of the implementation of measures in the 2008 SIP, and review of recent air quality data, and an updated modeled attainment demonstration.

H. Contingency Measures

a. Background

Under subpart 1 of the CAA, all $PM_{2.5}$ nonattainment areas must include in their SIPs contingency measures consistent with section 172(c)(9). Contingency measures are additional control measures to be implemented in the event that an area fails to meet RFP or fails to attain the standards by its attainment date. These contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date. The preamble to the proposal stated that the SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without significant further action by the State or by EPA. The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP.

The April 16, 1992 General Preamble provided the following guidance: ''States must show that their contingency measures can be implemented without further action on their part and with no additional rulemaking actions such as public hearings or legislative review. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the State of its failure.'' (57 FR at 13512.) This could include Federal measures and local measures already scheduled for implementation, as explained below.

The EPA has approved numerous SIPs under this interpretation—i.e., that use as contingency measures one or more Federal or local measures that are in place and provide reductions that are in excess of the reductions required by the attainment demonstration or RFP plan. (62 FR 15844, April 3, 1997; 62 FR 66279, December 18, 1997; 66 FR 30811, June 8, 2001; 66 FR 586 and 66 FR 634, January 3, 2001.) The key is that the statute requires that contingency measures provide for additional emission reductions that are not relied

on for RFP or attainment and that are not included in the demonstration. The purpose is to provide a cushion while the plan is being revised to meet the missed milestone. In other words, contingency measures are intended to achieve reductions over and beyond those relied on in the attainment and RFP demonstrations. Nothing in the statute precludes a State from implementing such measures before they are triggered. In fact, a recent court ruling upheld contingency measures that were previously required and implemented where they were in excess of the attainment demonstration and RFP SIP. *See LEAN* v. *EPA*, 382 F.3d 575, 5th Circuit., 2004.

One basis EPA recommends for determining the level of reductions associated with contingency measures is the amount of actual $PM_{2.5}$ emissions reductions required by the control strategy for the SIP to attain the standards. The contingency measures are to be implemented in the event that the area does not meet RFP, or attain the standards by the attainment date, and should represent a portion of the actual emissions reductions necessary to bring about attainment in area. Therefore, the emissions reductions anticipated by the contingency measures should be equal to approximately 1 year's worth of emissions reductions necessary to achieve RFP for the area.

As stated previously, EPA believes that contingency measures should consist of other available control measures beyond those required to attain the standards, and may go beyond those measures considered to be RACM for the area. It is important, however, that States make decisions concerning contingency measures in conjunction with their determination of RACM for the area, and that all available measures needed in order to demonstrate attainment of the standards must be considered first; all remaining measures should then be considered as candidates for contingency measures. It is important not to allow contingency measures to counteract the development of an adequate control strategy demonstration.

The preamble to the proposal stated that contingency measures must be implemented without ''significant further action'' after EPA determines that the area has either failed to meet RFP, or has failed to attain the standard by its attainment date. The purpose of the contingency measure provision is to ensure that corrective measures are put in place automatically at the time that EPA makes its determination that an area has either failed to meet RFP or failed to meet the standard by its attainment date. The EPA is required to determine within 90 days after receiving a State's RFP demonstration, and within 6 months after the attainment date for an area, whether these requirements have been met. The consequences for states which fail to attain or to meet RFP are described in section 179 of the CAA.

2. Final Rule

The final rule includes regulatory text for contingency measures and maintains the overall policy approach as described in the preamble to the proposal. The key requirements associated with contingency measures are:

—Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date.

—The SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without further action by the State or by EPA.

—The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP.

—The measures should provide for emission reductions equivalent to about 1 year of reductions needed for RFP, based on the overall level of reductions needed to demonstrate attainment divided by the number of years from the 2002 base year to the attainment year. Contingency measures are those measures that would not be included in the attainment strategy for various reasons; for example, they may not be as economically feasible as other measures that are considered to be RACM, or it may not be possible to implement the measures soon enough to advance the attainment date (e.g. federal mobile source measures based on the incremental turnover of the motor vehicle fleet each year).

3. Comments and Responses

Comment: Several comments were received concerning the requirement for contingency measures under section 172(c)(9). The proposal indicated that contingency measures adopted as part of the State plan are to be equal to approximately 1 year's worth of emissions reductions necessary to achieve RFP, as determined by the attainment demonstration for the area. One commenter indicates that this amount of reductions for contingency measures may be excessive in some cases. The commenter stated that States should be allowed to demonstrate appropriate amount of reductions for contingency measures in each area based on the degree of the $PM_{2.5}$ nonattainment area problem and the progression of emission reductions planned for the area as a part of the SIP.

Response: The EPA agrees that the CAA does not include the specific level of emission reductions that must be adopted to meet the contingency measures requirement under section 172(c)(9). One possible interpretation of the CAA would assume that contingency measures should be in place in the event that all of the State's measures fail to produce their expected emission reductions. Under this scenario, the State theoretically would be required to adopt sufficient contingency measures to make up for the entire short fall. In other words, the State would have to adopt ''double'' the measures required to satisfy the applicable emissions reduction requirements.

The EPA believes that this scenario would be highly unlikely and that this interpretation would be an unreasonable requirement. The adoption of double the measures needed for attainment would be difficult for States. Therefore, the EPA believes that it is reasonable that contingency measures should, at a minimum, ensure that an appropriate level of emissions reduction progress continues to be made if attainment or RFP is not achieved, or if an area fails to attain the standard by its statutory attainment date and additional planning is needed by the State. The EPA believes that the contingency measures adopted by the State for the affected area should represent a portion of the actual emissions reductions necessary to bring about attainment in the area. Therefore, EPA believes that it is reasonable to require states to adopt contingency measures equal to approximately 1 year's worth of emissions reductions necessary to achieve RFP for the area.

Comment: One commenter claimed that EPA incorrectly quoted the CAA as requiring SIPs to provide for implementation of contingency measures upon an attainment or RFP failure, without ''significant'' further action by the State or EPA. The commenter stated that section 172(c)(9) does not contain the word ''significant.'' The CAA requires that contingency measures take effect ''without further action'' by the State or EPA.

Response: The EPA agrees with the commenter that the general requirements for attainment plans specified under section 172(c)(9) State that each plan must contain additional measures that will take effect without

'further action' by the State or EPA if an area either fails to make RFP or fails to attain the standard by the applicable attainment date. Section 51.1012 of the final rule describes the contingency measures requirement and does not include the word ''significant.'' However, as a matter of practicality states need to take minimal steps to make contingency measures effective and alert the affected public that the measures are in force. Thus, EPA has indicated based on conclusions first made in the 1992 General Preamble that states should complete all of these administrative steps within 60 days and that all regulatory steps be completed before SIP submission.

Comment: The commenter further states that EPA is wrong in asserting that contingency measures can include Federal measures and local measures already scheduled for implementation, or previously implemented measures that provide 'excess' reductions. The CAA requires contingency measures to consist of controls 'to be undertaken if' the area fails to meet attainment or RFP. The commenter states that this language clearly states that such measures are to be new measures that will be undertaken upon the triggering event specifically to address RFP or failure to attain, not measures already in place, or measures required for other reasons.

Further, the commenter claims that EPA can not rationally refer to any reductions prior to an attainment or RFP failure as 'excess' when total reductions in the area in fact prove insufficient to meet attainment RFP. The commenter states that EPA cites a 5th Circuit case as support, but the commenter respectfully submits that the case was incorrectly decided on this issue for the aforementioned reasons.

Response: In response to comments claiming that EPA is wrong in asserting that contingency measures can include Federal measures and local measures already scheduled for implementation, or previously implemented measures that provide 'excess' reductions, as stated previously, the EPA has approved numerous SIPs under this interpretation. The statute requires that contingency measures provide for additional emission reductions that are not relied on for RFP or attainment and that are included in the attainment demonstration for the area. These measures are intended to provide a ''cushion'' in terms of emissions reductions for the area while the State is revising the SIP for the area due to the failure to show RFP or attain. In other words, contingency measures are intended to achieve reductions over and beyond those relied on in the attainment and RFP demonstrations. Nothing in the statute precludes a State from implementing such measures before they are triggered.

As noted above, EPA's General Preamble interpreted the control measure requirements of sections 172(c)(9) and 182(c)(9) to allow nonattainment areas to implement their contingency measures early. 57 FR 13498, 13511 (April 16, 1992). The EPA has applied this interpretation in rulemakings. See, for example, 67 FR 6,590, 6,591–92 (September 26, 2002). See also rulemakings cited in the Background section, above. As set forth above, the Fifth Circuit has upheld EPA's interpretation. *Louisiana Environmental Action Network* v. *EPA,* 382 F.3d 575 (Fifth Cir. 2004). (''*LEAN*'') Commenters have not provided a basis for concluding that the Fifth Circuit in the *LEAN* case wrongly interpreted the CAA.

Commenters contend that the language in the CAA regarding contingency measure controls ''to be undertaken'' requires measures not already in place or required for other reasons. The Fifth Circuit disagreed, finding that the terms in section 172(c)(9)—''to be undertaken'' and ''to take effect''—were ambiguous, and finding persuasive EPA's interpretation that this language allows measures already in place or otherwise required. The Court held:

> ''Here, the EPA's allowance of early reductions to be used as contingency measures comports with a primary purpose of the CAA—the aim of ensuring that nonattainment areas reach NAAQS compliance in an efficient manner—and necessary requirements of the CAA.'' 382 F.3d at 583.

The Court further found that ''By utilizing contingency measures early, the contingency measures ensured that 'an appropriate level of emissions reduction progress' would be implemented while the State 'adopt[ed] newly required measures resulting from the bump-up to a higher classification.'' [citing the General Preamble]. *Id.*

In addition, the Court agreed with EPA that ''early reductions are necessary in order to create an incentive for nonattainment areas to implement 'all reasonably available control measures as expeditiously as practicable' '' in accordance with section 172(c)(1) of the CAA. Thus the Court concluded that it would be ''illogical to penalize nonattainment areas that are taking extra steps, such as implementing contingency measures prior to a deadline, to comport with the CAA's mandate that such states achieve NAAQS compliance as 'expeditiously as practicable.' '' *Id.* at 583–584.

The Fifth Circuit also endorsed the concept of ''excess'' reductions, noting that the reductions credits at issue in that case, ''although already implemented, are in effect set aside, 'to be applied in the event that attainment is [not] achieved' and such reduction credits 'are not available for any other use.' [citations omitted]. The setting aside of a continuing, surplus emissions reduction fits neatly within the CAA's requirement that a necessary element of a contingency measure is that it must 'take effect without further action by the State or [EPA]'.'' The Court concluded that ''the early activation of continuing contingency measures is consistent with the purpose and requirements of the CAA statute.'' Id. at 584.

Thus, EPA's approval of early implemented contingency measures is consistent with the CAA, as well as with EPA guidance. For example, EPA has consistently taken the position that ozone nonattainment areas classified moderate and above must include sufficient contingency measures so that ''upon implementation of such measures, additional emissions reductions of up to 3 percent of the emissions in the adjusted base year inventory (or such lesser percentage that will cure the identified failure) would be achieved in the year following the year in which the failure has been identified.'' 57 FR at 13511 (EPA's General Preamble). Thus the contingency measures are supposed to ensure that progress towards attainment will occur while the relevant State adopts whatever additional controls may be necessary to correct a shortfall in emissions reductions. *Id.* The EPA has historically allowed early reductions—that is, reductions achieved before the contingency measure is ''triggered''—to be used as contingency measures. See also August 13, 1993 Memorandum from G.T. Helms: Early Implementation of Contingency Measures for Ozone and Carbon Monoxide (CO) Nonattainment Areas).

The commenter's argument that emission reductions cannot be valid contingency measures if they are otherwise required is also misplaced. A State must have the legal authority to require whatever reductions it may require as a contingency measure. As EPA has previously stated, ''all contingency measures must be fully adopted rules or measures.'' 62 FR 15844, 15846 (April 3, 1997). The fact that the State or Federal government has already exercised that authority is irrelevant because, as noted above, contingency measures must ''take effect

without further action by the State or [EPA].'' Section 172(c)(9). Thus, by definition, the State necessarily will have already exercised its legal authority to require reductions as a contingency measure before the measure is triggered. It does not matter whether or not a specific contingency measure is already required by law, as long as the emissions reductions that will result from that contingency measure have not been accounted for in the attainment and reasonable further progress demonstrations. If the reductions from the contingency measure are not available for any other use, then they are surplus that is set aside in the event reasonable further progress or attainment is not achieved.

A key element of a valid contingency measure reduction is that the State may not use the reduction in its attainment or reasonable further progress demonstrations if it is already using the reduction as a contingency measure. Those demonstrations must account for the actual emissions reductions that will make reasonable further progress towards, and achieve attainment of the NAAQS in the absence of contingency measures.

I. Transportation Conformity

Transportation conformity is required under CAA section 176(c) (42 U.S.C. 7506(c)) to ensure that Federally supported highway and transit project activities are consistent with (''conform to'') the purpose of the SIP. Conformity currently applies to areas that are designated nonattainment, and those redesignated to attainment after 1990 (''maintenance areas'' with plans developed under CAA section 175A) for the following transportation-related criteria pollutants: ozone, particulate matter ($PM_{2.5}$ and PM_{10}), carbon monoxide (CO), and nitrogen dioxide (NO_2). Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS (or ''standards'').

The final $PM_{2.5}$ implementation rule does not contain any revisions to the transportation conformity regulation. The EPA addressed the transportation conformity requirements that apply in $PM_{2.5}$ nonattainment and maintenance areas in three separate rulemakings as described below.

First, on July 1, 2004, EPA published a final rule (69 FR 40004) that addressed the majority of requirements that apply in $PM_{2.5}$ areas including:

- Regional conformity tests to be used in conformity determinations both before and after SIPs are submitted and motor vehicle emissions budgets are found adequate or are approved;
- Consideration of direct $PM_{2.5}$ emissions in regional emissions analyses;
- Consideration of re-entrained road dust in $PM_{2.5}$ regional emissions analyses;
- Consideration of transportation construction-related fugitive dust in $PM_{2.5}$ regional emissions analyses; and
- Compliance with $PM_{2.5}$ SIP control measures.

Then on May 6, 2005, EPA promulgated a final rule (70 FR 24280) that specified the transportation-related $PM_{2.5}$ precursors and when they apply in transportation conformity determinations in $PM_{2.5}$ nonattainment and maintenance areas.

Finally, on March 10, 2006, EPA promulgated a final rule (71 FR 12468) that establishes the criteria for determining which transportation projects must be analyzed for local particle emissions impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas. If required, an analysis of local particle emissions impacts is done as part of a transportation project's conformity determination.

Transportation conformity for the $PM_{2.5}$ standards began applying in $PM_{2.5}$ nonattainment areas on April 5, 2006, one year after the effective date of EPA's $PM_{2.5}$ nonattainment designations (i.e., April 5, 2005). CAA section 176(c)(6) and 40 CFR 93.102(d) provide a one-year grace period before conformity applies in areas newly designated nonattainment for a new standard. $PM_{2.5}$ SIP submissions such as RFP and attainment demonstrations would identify motor vehicle emissions budgets (''budgets'') for direct $PM_{2.5}$ or $PM_{2.5}$ precursors, as described below. These budgets would be used for satisfying transportation conformity requirements, once the budgets are found adequate or the SIP containing the budgets is approved by EPA. For example, state and local agencies would consider during the development of the $PM_{2.5}$ SIP whether reductions of on-road mobile source $S0_2$ emissions are a significant contributor to an area's $PM_{2.5}$ air quality problem, and if so, establish a $S0_2$ motor vehicle emissions budget for transportation conformity purposes.

The EPA has previously addressed its intentions regarding when budgets must be established in $PM_{2.5}$ SIPs for transportation conformity purposes. RFP plans, attainment demonstrations, and maintenance plans must include a budget for direct $PM_{2.5}$ emissions, except for certain cases as described below. All $PM_{2.5}$ SIP budgets would include directly emitted $PM_{2.5}$ motor vehicle emissions from tailpipe, brake wear, and tire wear. States should also consider whether re-entrained road dust or highway and transit construction dust are significant contributors and should be included in the $PM_{2.5}$ budget. For further information, see 40 CFR 93.102(b) and 93.122(f) of the transportation conformity regulation, as well as Sections VIII–X of the July 1, 2004 conformity rule preamble at 69 FR 40031–40036.

Under certain circumstances, directly emitted $PM_{2.5}$ from on-road mobile sources may be found an insignificant contributor to the air quality problem and NAAQS. Section 93.109(k) of the conformity rule states that ''[s]uch a finding would be based on a number of factors, including the percentage of motor vehicle emissions in the context of the total SIP inventory, the current state of air quality as determined by monitoring data for that NAAQS, the absence of SIP motor vehicle control measures, and historical trends and future projections of the growth of motor vehicle emissions.'' The EPA discussed its intentions for applying the insignificance provision in the July 2004 final rule (69 FR 40061–40063).

In the May 6, 2005 final rule, EPA provided details regarding when states must establish SIP budgets for any $PM_{2.5}$ precursor (i.e., NO_X, VOCs, $S0_2$ and ammonia). If through the SIP process a state concludes that on-road mobile source emissions of one or more precursors are significant (i.e. need to be addressed in order to attain the $PM_{2.5}$ standards as expeditiously as practicable), then EPA expects that the state will include a budget in the SIP for each of the relevant precursors. (70 FR 24287) The EPA also noted in the May 2005 conformity rule that, if inventory and modeling analyses demonstrating RFP, attainment or maintenance indicate a level of emissions of a precursor that must be maintained to demonstrate compliance with the applicable requirement, then that level of emissions should be clearly identified in the SIP as a budget for transportation conformity purposes, even if the SIP does not establish particular controls for the given precursor. If the state fails to identify such a level of emissions as a budget, EPA will find the submitted SIP budgets inadequate because the SIP fails to clearly identify the motor vehicle emissions budget as required by the conformity rule (40 CFR 93.118(e)(4)(iii)). (70 FR 24287) In determining whether the on-road mobile source emissions of a $PM_{2.5}$ precursor are significant, state and local agencies would use the criteria for insignificance findings provided in 40 CFR 93.109(k)

of the transportation conformity regulation. A further discussion of the criteria to be considered in establishing $PM_{2.5}$ precursor budgets is contained in the May 2005 final transportation conformity rule (70 FR 24282–24288). If state and local agencies conclude that on-road sources of a precursor are not a significant contributor to the area's $PM_{2.5}$ air quality problem, as described above, motor vehicle emissions budgets would not be established even though emissions may be addressed in the area's RFP plan, attainment demonstration and/or maintenance plan.

J. General Conformity

a. Background

The General Conformity regulations promulgated in 1993 establish an implementation process where Federal agencies are responsible for making their own determination of conformity with State implementation plans (SIPs), and EPA plays an advisory role. Recognizing that it was impracticable to evaluate all Federal actions for conformity, EPA created a number of exemptions in those regulations for actions with insignificant or not reasonably foreseeable emission increases, including exemptions for Federal actions with emissions below specified *de minimis* levels. When a Federal agency must demonstrate conformity for an action, the regulations provide several methods for making that demonstration. With the designations of $PM_{2.5}$ nonattainment areas on April 5, 2005, requirements for demonstrating conformity become effective in those areas on April 5, 2006.

On July 17, 2006 EPA issued a final rule (71 FR 40420) to amend the General Conformity Regulations to establish *de minimis* levels for $PM_{2.5}$ for the General Conformity program. The final rule established 100 tons/year of direct $PM_{2.5}$ emissions and its precursors as the *de minimis* level where the General Conformity regulations would apply in $PM_{2.5}$ nonattainment areas. In the process of finalizing the *de minimis* level for $PM_{2.5}$ three comments were received. One commenter was concerned about emissions from burning by Federal agencies. Another commenter proposed that the *de minimis* level for emissions of direct $PM_{2.5}$ should be set significantly lower than 100 tons—in the range of 25–50 tons per year (TPY) in areas that are likely to attain the $PM_{2.5}$ national ambient air quality standard within 5 years, and a level of 10–25 TPY in areas that are likely to take more than 5 years to achieve the national ambient air quality standard. A third commenter supported the proposed *de minimis* level.

The final rule revises the tables in sub-paragraphs (b)(1) and (b)(2) of the General Conformity Regulations by adding a *de minimis* emission level for $PM_{2.5}$ and its precursors. This action maintained our past policy of consistency between the conformity *de minimis* emission levels and the size of a major stationary source under the New Source Review program (70 FR 65984). These levels are also consistent with the levels promulgated for Reasonably Available Control Technology applicability levels for volatile organic compound and nitrogen oxide emissions in subpart 1 areas under the 8-hour ozone implementation strategy (68 FR 32843). Since EPA is not finalizing any classifications for the $PM_{2.5}$ nonattainment areas, we did not establish differing $PM_{2.5}$ *de minimis* emission levels for higher classified nonattainment areas.

b. Comments and Responses

Comment: One commenter requests that EPA communicate to all Federal agencies the value of the agencies advising the States as soon as possible of any planned future projects in nonattainment areas that may be above the General Conformity *de minimis* values or that will have to be evaluated to show that they are below *de minimis*. This is for projects that are very likely to proceed. The aim is to consider these future emissions in any growth projections during SIP development since such growth may not be anticipated well by the available growth model (E–GAS). States can communicate with existing Federal facilities now concerning this issue.

Response: The EPA sees the value in Federal agencies working with States to anticipate growth in emissions and include those anticipated emissions in the applicable SIP. The EPA is in the process of proposing regulatory amendments to the General Conformity regulations that provide a framework for Federal facilities to work with States to account for facility-wide emissions in SIPs and to include Federal facility emissions in future SIPs. The EPA anticipates that these rule amendments should be proposed before the end of summer 2006.

Comment: Some commenters stated that the *de minimis* level for $PM_{2.5}$ for conformity applicability should be less than 100 tons per year. A level of 50 tons per year was suggested for direct $PM_{2.5}$ emissions.

Response: Similar comments were received when the $PM_{2.5}$ *de minimis* level was proposed on April 5, 2006. The response to those comments can be found in the preamble to the final rule setting the *de minimis* level for $PM_{2.5}$ at 71 FR 40420.

Comment: Are the precursors for general conformity consistent with this rulemaking or with the transportation conformity rulemaking?

Response: The precursors for general conformity are generally consistent both with this rule and the transportation conformity rule. The only difference between the transportation rule and this rule is that SO_2 is not considered a precursor for transportation conformity determinations that occur prior to a $PM_{2.5}$ SIP unless EPA or the State air agency finds on-road mobile source emissions significant. For more information, see the May 6, 2005 transportation conformity rule on $PM_{2.5}$ precursors at 70 FR 24283. Since general conformity includes analysis of stationary sources the general conformity rule requires SO_2 as a precursor both before and after a $PM_{2.5}$ SIP is submitted.

Comment: When will rulemaking containing the *de minimis* levels for $PM_{2.5}$ and for the precursors be issued? There is some confusion, since the proposed rule says that states should assume 100 tpy for all $PM_{2.5}$ pollutants, as this would make it consistent with the levels for NO_X and VOC for the subpart 1 areas under 8-hour ozone. However, since New Jersey's classification is moderate under the 8-hour ozone standard and we are in an Ozone Transport Region, the *de minimis* level for VOC is 50 tons per year.

Response: On July 17, 2006 EPA issued a final rule (71 FR 40420) to amend the General Conformity Regulations to establish *de minimis* levels for $PM_{2.5}$ for the General Conformity program. The final rule established 100 tons/year of direct $PM_{2.5}$ emissions and its precursors as the *de minimis* level where the General Conformity regulations would apply in $PM_{2.5}$ nonattainment areas. Since EPA is not finalizing any classifications for the $PM_{2.5}$ nonattainment areas, we did not establish differing $PM_{2.5}$ *de minimis* emission levels for based on a classification scheme.

Comment: If a Statement of Conformity has been issued on a project and if the project has not been completed to date, are they required to address $PM_{2.5}$ prior to completion of the project or will they be grandfathered in?

Response: If a Federal action has completed a conformity determination and the action has started (regardless of whether the project is complete or not) then no new determination is needed. If

the conformity determination was completed, but the action did not start in 5 years a new determination is needed under the general conformity rules.

Comment: What guidance should states use to establish budgets for large facilities or military bases?

Response: The EPA has not issued any guidance for States and Federal facilities to establish facility-wide budgets in the applicable SIP. There is nothing in the General Conformity regulations preventing this approach which would allow Federal actions that do not increase total facility emissions over the budget in the SIP from determining the action conforms on the basis of its compliance with the budget limit. The EPA sees this practice as a positive step to encourage States and Federal agencies to work together to account for emissions in a SIP so they conform with the purposes and goals of the SIP. The EPA intends to address the approach and provide guidance in planned revisions to the General Conformity regulations which are expected to be proposed in 2006.

K. Emission Inventory Requirements

a. Background

Emission inventories are critical for the efforts of State, local, tribal and federal agencies to attain and maintain the NAAQS that EPA has established for criteria pollutants including $PM_{2.5}$. Pursuant to its authority under section 110 of Title I of the CAA, EPA has long required States to submit emission inventories containing information regarding the emissions of criteria pollutants and their precursors. The EPA codified these requirements in 40 CFR part 51, subpart Q in 1979 and amended them in 1987.

The 1990 CAAA revised many of the provisions of the CAA related to attainment of the NAAQS and the protection of visibility in mandatory Class I Federal areas (certain national parks and wilderness areas). These revisions established new emission inventory requirements applicable to certain areas that were designated nonattainment for certain pollutants. In the case of particulate matter, the emission inventory provisions are in the general provisions under Section 172(c)(3).

In June 2002, EPA promulgated the Consolidated Emissions Reporting Rule (CERR) (67 FR 39602; June 10, 2002), 40 CFR part 51 subpart A. The CERR consolidated the various emissions reporting requirements that already existed into one place in the CFR, established new reporting requirements for $PM_{2.5}$ and ammonia, and established new requirements for the statewide reporting of area source and mobile source emissions.

The CERR established two types of required emission inventories: annual inventories, and 3-year cycle inventories. The annual inventory requirement is limited to reporting statewide emissions data from the larger point sources. For the 3-year cycle inventory, States need to report data from all of their point sources plus all of the area and mobile sources on a statewide basis. A special case existed for the first 3-year cycle inventory for the year 2002 which was due on June 1, 2004.

The EPA issued guidance suggesting that 2002 be used as the Base Year for 8-hour ozone, $PM_{2.5}$ and regional haze planning efforts (November 18, 2002 EPA memorandum ''2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, $PM_{2.5}$ and Regional Haze Programs'' *http://www.epa.gov/ttn/chief/eidocs/2002baseinven_102502new.pdf*).

States should estimate mobile source emissions by using the latest emissions models and planning assumptions available at the time the SIP is developed. Information and guidance on the latest emissions models is available at *http://www.epa.gov/otaq/stateresources/transconf/policy.htm#models* and at *http://www.epa.gov/otaq/models.htm.*

By merging the information on point sources, area sources and mobile sources into a comprehensive emission inventory, State, local and tribal agencies may do the following:

- Set a baseline for SIP development.
- Measure their progress in reducing emissions.
- Have a tool to support future trading programs.
- Answer the public's request for information.

The EPA uses the data submitted by the States to develop the National Emission Inventory (NEI). The NEI is used by EPA to show national emission trends, as modeling input for analysis of potential regulations, and other purposes.

Most importantly, States need these inventories to help in the development of control strategies and demonstrations to attain the annual and 24-hour $PM_{2.5}$ NAAQS. In April 1999, EPA published the ''Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,'' EPA–454/R–99–006. The EPA updated this guidance in November 2005.[46] The current version of this guidance is available at: *http://www.epa.gov/ttn/chief/eidocs/eiguid/index.html.* The EPA developed this guidance document to complement the CERR and to provide specific guidance to State and local agencies and Tribes on how to develop emissions inventories for 8-hour ozone, $PM_{2.5}$, and regional haze SIPs. While the CERR sets forth requirements for data elements, EPA guidance complements these requirements and indicates how the data should be prepared for SIP submissions.

The SIP inventory must be approved by EPA as a SIP element and is subject to public hearing requirements, whereas the CERR is not. Because of the regulatory significance of the SIP inventory, EPA will need more documentation on how the SIP inventory was developed by the State as opposed to the documentation required for the CERR inventory. In addition, the geographic area encompassed by some aspects of the SIP submission inventory will be different from the statewide area covered by the CERR emissions inventory. The CERR inventory was due June 1, 2004, while the SIP inventory due date is later. Because of this time lapse, the State may choose to revise some of the data from the CERR when it prepares its SIP inventory to account for improvements in emissions estimates. If a State's 2005 emission inventory (or a later one) becomes available in time to use for timely development of a nonattainment area SIP, then that inventory can be used. We also encourage the cooperation of the Tribes and the State and local agencies in preparing their emissions inventories.

b. Final Rule

In the proposed rulemaking, in § 51.1008(a), to meet the emission inventory requirements of section 172(c)(3), EPA proposed to require submission of the CERR inventories as well as ''any additional emission inventory information needed to support an attainment demonstration and RFP plan ensuring expeditious attainment of the annual and 24-hour $PM_{2.5}$ standards.'' Section 51.1008(b) set forth specifications for baseline emissions inventories for attainment demonstrations and RFP requirements. Section 51.1008 of the final rule reflects our proposed rule but is different from the draft regulatory text. The proposal did not specify a deadline for

[46] Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,'' (EPA–454/R–05–001, November 2005.

submission of the emission inventory. To ensure clarity, the final rule contains language addressing the deadline for submission of emissions inventories for nonattainment areas under section 172(c)(3) and section 172(b), and reflects the statutory requirement of no later than 3 years after designation of the area. See § 51.1008(a). In addition, § 51.1008(a)(1) of the proposed rule has been changed for purposes of clarification. The proposal referred to the requirement to submit statewide emission inventories under the (CERR), contained in 40 CFR part 51, subpart A. The final regulatory text clarifies this to refer to the requirements for data elements under 40 CFR part 51, subpart A. The EPA did not intend that the emissions inventories developed under the CERR, which are statewide, would be appropriate for and satisfy all aspects of SIP inventories developed for SIP submissions. Section 51.1008(b) has a minor change to clarify that this subsection refers to the inventories required for submission under paragraph (a) of section 51.1008, and also clarifies the reference to 40 CFR Part 51 subpart A, which currently contains the CERR. In addition, section 51.1008(b) as finalized provides that ''The baseline emission inventory for calendar year 2002 or other suitable year shall be used for attainment planning and RFP plans for areas initially designated nonattainment for the $PM_{2.5}$ NAAQS in 2004.'' The EPA added this flexibility to be consistent with EPA's ozone implementation rule, and to enable a State to use a more recent and improved base year inventory if it is completed in time to allow for timely development of the attainment plan. As noted above, we expect that States will consult the guidance document titled *Emission Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (''NAAQS'') and Regional Haze Regulations,* November 2005,and submit inventories that are appropriate for the geographic area at issue and consistent with regulations and this guidance. We expect the States to include in their SIP submission documentation explaining how the emissions data were calculated.

In the proposed rulemaking, EPA asked ''What emission inventory requirements should apply under the $PM_{2.5}$ NAAQS.'' Several specific questions followed this general question to assess whether or not additional emission inventory requirements or guidance are needed to implement the proposed standard. It was noted in the proposal that the basis for EPA's emission inventory program is specified in the Consolidated Emissions Reporting Rule (CERR) and the related guidance document titled *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations.*

Subsequent to the proposed rulemaking, EPA proposed the Air Emissions Reporting Rule (AERR) at 71 FR 69 (Jan. 3, 2006). The AERR would update CERR reporting requirements by consolidating and harmonizing new emissions reporting requirements with pre-existing sets of reporting requirements under the Clean Air Interstate Rule (CAIR) and the NO_X SIP Call. At this time, EPA is reviewing comments submitted on the AERR proposal and expects to finalize this rulemaking during calendar year 2007. The AERR is expected to be a means by which the Agency will implement additional data reporting requirements for $PM_{2.5}$ SIP emission inventories. Since the AERR rulemaking is in progress, EPA believes it is appropriate to defer responding to certain comments on the proposed $PM_{2.5}$ Implementation Rule related to data reporting and emission inventory requirements that were discussed in the AERR proposal. Those comments will be addressed in the final AERR rulemaking. Significant comments that are separable from the AERR rulemaking and relate to data reporting and emission inventory requirements for the $PM_{2.5}$ NAAQS are addressed below and in EPA's Responses to Comments document.

With respect to SIP emission inventory requirements under this rulemaking, EPA recognizes NO_X, SO_2, VOCs, and ammonia as potential precursors of $PM_{2.5}$ because these pollutants can contribute to the formation of $PM_{2.5}$ in the ambient air. To provide a technical foundation for understanding contributions to $PM_{2.5}$ nonattainment problems and for identifying potential future measures to reduce $PM_{2.5}$ concentrations, EPA is requiring under 40 CFR part 51 subpart A and 40 CFR 51.1008 of this rule that States develop and submit inventories for direct $PM_{2.5}$ and all precursors of $PM_{2.5}$. This requirement stands apart from the policies in this rule regarding the required treatment of various precursor emissions in the development of control strategies for attaining the $PM_{2.5}$ standards. With respect to the latter requirements, EPA has not made a finding that all precursors should be evaluated for potential control measures in each specific nonattainment area. The policy approach in the rule instead requires evaluation of control measures for direct $PM_{2.5}$ and sulfur dioxide in all areas, and describes general presumptive policies that NO_X sources need to be evaluated for control measures in all areas unless findings of insignificance are made, but that control measure evaluations are not required for sources of ammonia and VOC unless findings of significance are made. The rule also provides a mechanism by which the State and/or EPA can make an area-specific demonstration to reverse the general presumption for these three precursors. (See section II.A.8 for additional discussion on these issues.)

c. Comments and Responses

1. Should EPA Specify an Inventory Approval Process?

Comment: Several commenters indicated that the current process of approving SIP inventories by EPA regional offices is appropriate and did not believe that additional approval requirements were necessary. Some commenters noted that flexibility is needed to address regional concerns. Several commenters noted that SIP emission inventories may include requirements or information in addition to data required by the Consolidated Emissions Reporting Rule (CERR). One commenter observed that States routinely develop information outside the CERR for purposes of their SIP development and that additional requirements should not be defined by EPA. Another commenter recommended that requirements for nonattainment area emission inventories be incorporated in the CERR or AERR. A few commenters felt that additional guidance was needed on the SIP emission inventory approval process.

Response: The SIP emissions inventory is a plan provision that must be approved by EPA under section 110(k) of the CAA and is subject to public hearing requirements pursuant to section 110(a)(2). The EPA believes that it need not further specify a SIP approval process for emissions inventories beyond that set forth in the statute, regulation (51.1008), other related sections of this rulemaking and EPA's current guidance. The EPA agrees with many of the commenters that the approval process for SIP emission inventories need not be further defined and that approval should be conducted at the regional level to provide flexibility to address regional concerns. The EPA also agrees that use of Quality Assurance Project Plans developed for each state will be helpful in establishing the proper approval process. The EPA

addresses the issue of what data elements are needed for SIP approval in the responses to comments below, including the responses to comments under Issue 2, below.

As noted by two commenters EPA describes procedures for approval of SIP inventories in a document titled *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,* November 2005. Section 2.5, Inventory Approval, references a memorandum titled *Public Hearing Requirements for 1990 Base-Year Emissions Inventories for Ozone and CO Nonattainment Areas, September 29, 1992.* The EPA intends to use the procedures discussed in the guidance and memorandum to the extent that they are applicable to approval of $PM_{2.5}$ emission inventories submitted as part of the SIP. 40 CFR 51.1008 sets forth the requirements for emissions inventories under section 172(c)(3), which will be reviewed in the context of the SIP approval process. See also 40 CFR 51.1007 and 51.1009 regarding attainment demonstrations and RFP plans. Thus, EPA believes that its existing SIP approval process is adequately described in statute, regulation and guidance, and that it provides flexibility to deal with issues that arise in individual nonattainment areas.

2. Are the Data Elements Specified Within the CERR Sufficient To Develop Adequate SIPs? For Example, in the Determination of RACT, Should More Information on Existing Control Devices Be Required?

Comment: Several commenters recommended that any additional reporting requirements should be addressed through the CERR/AERR and associated guidance and that no additional reporting requirements should be specified in the Rule. Another commenter stated that more detail concerning control equipment would be helpful but was concerned about the additional burden on industry compared to the benefit to State and local agencies, and suggested that this would be further addressed in the context of comments on the AERR. One commenter believed that the reporting requirements within the CERR are sufficient to develop a $PM_{2.5}$ SIP for most areas but noted that nonattainment areas may require additional inventory information which will need evaluation on a case-by-case basis. The commenter further stated that any additional inventory requirements should be identified during the SIP development process, in cooperation with the EPA regional office, and should not be part of this rule.

Response: In section 40 CFR 51.1008(a)(1) of the final rule, EPA incorporates the requirements for data elements required under 40 CFR part 51, subpart A, which contains the CERR, for inventories submitted under this section. The EPA notes, however, that the issue of whether to require additional reporting requirements beyond those required in the CERR is currently being addressed in the Air Emissions Reporting Rule (AERR) 71 FR 69 (January 3, 2006). At this time EPA believes that the requirements for data elements under the CERR, in conjunction with the other provisions of 40 CFR 51.1008, as well as 40 CFR 51.1007 and 51.1009, are generally adequate to meet the needs for $PM_{2.5}$ nonattainment emission inventory SIP development. The AERR as proposed includes additional provisions which may be helpful for $PM_{2.5}$ SIP emission inventory development. The EPA will address this aspect of the AERR, including comments received in this rulemaking on the issues raised and the additional elements proposed in the AERR, in the final AERR rulemaking. This final rule indicates that States shall include data elements for $PM_{2.5}$ inventories as required under 40 CFR part 51, subpart A. In addition, 40 CFR 51.1008(a)(2) requires that States submit ''any additional emission inventory information needed to support an attainment demonstration and RFP plan ensuring expeditious attainment of the annual and 24-hour $PM_{2.5}$ standards.'' See also 40 CFR 51.1007 and 51.1009. Thus States should be aware that data elements in addition to those required under the CERR may be needed to support attainment demonstrations and RFP inventories. Additional data elements needed for other SIP emission inventory purposes should be handled on a case-by-case basis. Because of the nature of SIP development, which varies depending on the nature and needs of individual areas, it may not be possible to require a level of detail in regulations that will enable a ''one-stop-shop'' information request as suggested by one of the commenters.

As recommended by one commenter, guidance on reporting requirements is contained in *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations* (EPA–454/R–05–001, November 2005). For example, Section 3.2.1 for Pollutant and Pollutant Precursors to be Inventoried presents guidance to states on $PM_{2.5}$ pollutants and their components that should be reported for $PM_{2.5}$ SIP development. See also section 5, Emission Inventory Development, and other related sections of the guidance.

With respect to the comment on additional detail on control requirements, see also EPA's Response to Comment Document.

3. Is the Current Approach for Reporting Specific Pollutants Sufficient, or Should EPA Require More Specific Emission Component Reporting Such as Groups of Compounds or Reporting of Elemental Carbon and Organic Carbon?

Comment: Currently the CERR requires the reporting of SO_2, VOC, NO_X, CO, Pb, PM_{10}, $PM_{2.5}$, and NH_3. VOC and PM are speciated by the emissions processing models based on speciation profiles for specific source categories. Most commenters supported retaining the existing reporting requirements under the CERR. Others encouraged expansion of the requirements to include reporting of specific organic compounds and organic fractions although some thought this should be a requirement while others thought it should be optional. One commenter thought that EPA should work with industry trade groups to develop and improve the speciation profiles of the most important source categories rather than asking the state and local agencies to characterize VOC and PM species. Several commenters thought that EPA should encourage the reporting of PM components (filterable, condensable and total) for development of control strategies and attainment demonstrations. Another commenter noted that including condensable emissions raises ''uncertainty'' issues and urged EPA to devote resources to developing better test methods. One commenter believed that in addition to reporting $PM_{2.5}$ and its components, states should report all precursors to $PM_{2.5}$ (SO_2, NO_X, ammonia and VOC).

Response: The EPA agrees with the commenters who argued that the need for additional speciation should be determined based on specific SIP needs. 40 CFR part 51, subpart A which contains the CERR, does not require reporting of specific compounds or compound groups nor does it require reporting of organic and elemental carbon fractions. As discussed in the response to comment above, EPA believes that the requirements for data elements contained in 40 CFR part 51 subpart A, in conjunction with the provisions of 40 CFR 51.1008, are generally adequate to meet the needs for $PM_{2.5}$ nonattainment emissions

inventory SIP development. Section 51.1008(a)(1) applies the data element requirements contained in 40 CFR part 51 subpart A. Section 51.1008(a)(2) requires States to submit ''any additional emission inventory information needed to support an attainment demonstration and RFP plan ensuring expeditious attainment of the annual and 24-hour $PM_{2.5}$ standards.'' Thus data elements in addition to those required under the CERR may be needed to support attainment demonstrations and RFP inventories under 40 CFR 51.1008(a)(2). Additional data elements needed for other SIP emission inventory purposes should be handled on a case-by-case basis. Where States need to develop speciated emissions for $PM_{2.5}$ SIP emission inventories, EPA provides guidance in the document titled *Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Ozone Regulations,* November 2005. Section 3.2.1, Pollutants and Pollutant Precursors to be Inventoried identifies pollutants and their components to be reported for $PM_{2.5}$ SIPs. Section 3.3.5, Speciation Procedures, discusses the preferred approach for speciating $PM_{2.5}$ emission inventories for use in ambient air quality simulations. The approach discussed in the guidance is application of emission models which use speciation profiles to estimate the mass of specific compounds and compound groups for VOC and elemental and organic carbon fractions for PM. The EPA encourages further research and development of technical tools to better characterize emissions inventories for specific VOC compounds and to determine the extent of specific VOC compounds and organic PM mass. The EPA also encourages States to continue efforts to refine their ammonia inventories. See sections II.A.3 and II.A.4 of the Preamble.

As discussed in the guidance document, EPA encourages reporting of organic and elemental fractions of $PM_{2.5}$ by state agencies (see Section 3.2.1, Pollutants and Pollutant Precursors to be Inventoried). While elemental or black carbon (EC/BC) and organic carbon (OC) will be identified in default speciation profiles, more locally-specific data should be collected where available as an input to model preprocessing. Where such data are available, they should be provided to EPA to help in improving EPA's speciation profiles. Certain organic gases have been identified as precursors to secondary organic aerosols (SOA). Toluene, xylene and ethyl benzene are known to be important SOA precursors. Additional organic gases may be identified by ongoing research. While these gases will be identified in default speciation profiles, more locally-specific data should be collected, where available, as an input to model preprocessing. State, local and Tribal agencies can contact EPA's EIAG for more information.

EPA agrees with the comment that it should take the lead in updating VOC and PM profiles for most important source categories. The Agency is close to completing a multi-year effort to update the SPECIATE database. SPECIATE is EPA's repository of Total Organic Compound (TOC) and PM speciated profiles for a wide variety of sources. The profiles in this system are provided for air quality dispersion modeling and as a library for source-receptor and source apportionment type models. This recent initiative to update SPECIATE was needed because speciated emissions profiles continue to be developed and the data in the existing EPA database (SPECIATE 3.2) was becoming outdated.

This work was coordinated with interested parties including industry through an Agency sponsored workgroup. It has depended largely on the collection and review of existing profile data to accomplish, as the commenter suggests, delivering the best results for the least amount of resources spent. Previously, these data were not widely available to emission inventory developers and lacked the quality assurance review and evaluation needed to develop profiles used by emissions models to generate speciated emissions. As suggested by the commenter, the workgroup was used to help prioritize source categories for investigation to ensure that updates to existing profiles and development of new profiles focused on areas of greatest need.

SPECIATE v4.0 contains more than 2500 source profiles and is currently undergoing peer review. The EPA expects the final work product to be available for use by emission inventory preparers during early calendar year 2007 and it will be distributed through EPA's CHIEF Web site.

The EPA agrees with a commenter who noted that in order to meet the requirements under section 172(c) of the CAA for ''a comprehensive, accurate, current inventory * * *,'' condensable emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors are important to support development of local control strategies and attainment demonstrations. The EPA believes that the final rule provides for the submission of $PM_{2.5}$ nonattainment area inventories meeting the requirements of section 172(c)(3).

Section 51.1008(a)(1) requires that States submit emission inventories for $PM_{2.5}$ that satisfy the data elements reporting requirements under 40 CFR part 51 subpart A, which contains the CERR. The CERR requires reporting of ''Primary $PM_{2.5}$'' which is defined as the sum of the filterable and condensable portions of $PM_{2.5}$. Therefore, SIP base year inventories will include the condensable fraction of PM which was of concern to several commenters. The CERR also requires reporting of SOx, NO_X, ammonia and VOC which are potential precursors to $PM_{2.5}$. EPA notes that the AERR as proposed would require reporting of the same precursors and would also require reporting of Primary $PM_{2.5}$. However, the proposed AERR requires the reporting of the filterable and condensable fractions of $PM_{2.5}$ (optional under the CERR) in addition to the primary $PM_{2.5}$ total mass. The EPA will address this requirement in its final rulemaking on the AERR.

As noted above, in addition to the data element requirements under section 51.1008(a)(1), under section 51.1008(a)(2) States must submit ''any additional emission inventory information needed to support'' an attainment demonstration and RFP plan. Thus States should be aware that data elements in addition to those required under the CERR may be needed to support attainment demonstrations and RFP inventories under 40 CFR Part 51.1008(a)(2). Additional data elements needed for other SIP emission inventory purposes should be handled on a case-by-case basis.

The EPA is aware of the issues raised by one commenter regarding measurement uncertainty for condensable PM. This issue is addressed in detail under Section II.L of the preamble (''Condensable particulate matter test methods and related data issues,''). We believe that for purposes of emissions inventories and attainment demonstrations, States should continue to describe the impacts of baseline emissions and develop future air quality strategies using information available on primary $PM_{2.5}$ emissions, including condensable $PM_{2.5}$. However, with respect to developing enforceable emissions limits for condensable $PM_{2.5}$ emissions, the final rule reflects EPA's adoption of a transition period during which we will allow time for development of emissions limits for condensable $PM_{2.5}$. See 40 CFR 51.1002(c).

For additional comments and responses related to speciation issues,

see the Response to Comments Document.

4. Should EPA Require That States Develop Their Own Estimates for Area and Mobile Source Emissions?

Comment: The CERR allows states to adopt EPA developed emission estimates from area and mobile sources in lieu of making those estimates themselves if they accept these estimates for their emission inventory. One commenter thought that EPA should require States to develop their own estimates for area and mobile sources based on the specified 2002 base year. Three commenters thought that the existing process (under the CERR) was adequate. One of the commenters expressed concerns about the reporting burden for States if they were required to compile their own mobile and area source inventories. Another commenter did not believe that States should be required to submit data on area and mobile sources but noted that many States would continue to run the MOBILE model for onroad mobile sources and calculate area source data for SIP emission inventories. Two of the commenters thought that the existing process provided flexibility needed by States to focus on source categories of most concern and address problematic areas with special inventory needs. One commenter recommended that EPA continue developing models for area and mobile sources.

Response: The EPA strongly encourages states to submit their own estimates for area (nonpoint) and mobile sources unless they can establish that it is impracticable to do so, given time and resources. We will continue, in appropriate circumstances, to allow a State to use EPA-developed emission estimates for mobile and nonpoint sources in lieu of making those estimates itself if the State accepts the estimates for its emission inventory. While this has been the case with respect to reporting under the CERR for the 3-year cycle inventories, for development of emission inventories to support $PM_{2.5}$ SIPs, the ability to rely on EPA-developed emission estimates for development of emission inventories to support $PM_{2.5}$ SIPS is more complex and problematic. For mobile sources, the practical use of these EPA-developed mobile source inventories in a SIP may be very limited. While EPA has developed inventories for 2002, states will still have to develop attainment year inventories, including projections of future activity and the effects of control measures. For mobile sources, future year inventories are not developed by simply growing a base year inventory, but instead are developed by running an emissions model with appropriate inputs for the future year. In order to develop an attainment demonstration that accurately accounts for the change in emissions from the base year to the attainment year, inventories for both of those years will need to be developed using consistent methods and modeling assumptions. For mobile sources especially, it may be very difficult for states to replicate the methods used by EPA for the base year when creating the attainment year inventory.

In addition, states cannot use the EPA developed inventories for the base year if newer models or planning assumptions are available at the time they begin working on the SIP. For example, if new or better information about the composition of the local fleet of highway vehicles in the base year becomes available to the state after the EPA developed inventories were created, that information should be used by the state to create a new base year inventory.

Given the need for emissions modeling for mobile sources in the projection year, the need for consistency in tools and methods between the base year and attainment year, and the need to use latest available models and planning assumptions, EPA believes that most if not all states will choose to develop their own base year inventories for mobile sources.

With respect to nonpoint (area) source emissions, States must make every effort, consistent with available timing and resources to ensure that their area source emission inventories are as accurate as possible. While EPA prepares a national area source emission inventory that covers all counties, it is designed for national analyses. EPA does not have access to the more detailed information available to States that is used to develop an area source inventory. Therefore, states should develop as much of their area source inventory as possible using local and State information, and in particular should develop the inventory for the most significant area source categories which are critical to ensuring overall accuracy. Where time and resources preclude a State from developing the estimates for less-critical area source categories, the State may rely on EPA-developed area source emissions information for those categories.

The EPA points out that although guidance has recommended that 2002 be used as the base year for emissions inventories for states initially designated nonattainment in 2004–5, states remain free to use an alternate base year, as appropriate. Section 51.1008(b) provides in relevant part that ''The baseline emission inventory for calendar year 2002 or other suitable year shall be used for attainment planning and RFP plans for areas initially designated nonattainment for the $PM_{2.5}$ NAAQS in 2004.''

EPA agrees with the comment that it should continue to develop models and other emission estimation tools. As an example, EPA's Office of Transportation and Air Quality (OTAQ) is developing a modeling system termed the Motor Vehicle Emission Simulator (MOVES). This new system will estimate emissions for on-road and nonroad sources, cover a broad range of pollutants, and allow multiple scale analysis, from fine-scale analysis to national inventory estimation. When fully implemented MOVES will serve as the replacement for MOBILE6.2 and NONROAD. In addition, as the NEI is reengineered, OAQPS will examine the need for updating emissions estimation guidance materials and developing tools which will assist State agencies in estimating emissions from area source categories. See also EPA's ''Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,'' November 2005.

5. Other Inventory Issues

The EPA's responses to additional comments concerning emission inventory issues can be found in EPA's Response to Comments Document.

L. Condensable Particulate Matter Test Methods and Related Data Issues

a. Background

As noted in the preamble to the November 1, 2005 proposed rule, certain commercial or industrial activities involving high temperature processes (fuel combustion, metal processing, cooking operations, etc.) emit gaseous pollutants into the ambient air which rapidly condense into particle form. The constituents of these condensed particles include, but are not limited to, organic material, sulfuric acid, and metals. Because condensable emissions exist almost entirely in the 2.5 micrometer range and smaller, these emissions are inherently more significant for $PM_{2.5}$ than for prior particulate matter standards addressing larger particles. Therefore, we believe that it is important that the air quality management of particulate matter promote a comprehensive approach to condensable particulate matter.

We proposed to require a comprehensive inclusion of condensable PM for all aspects of SIP development for $PM_{2.5}$. Under the proposal, EPA would require condensable PM to be considered in the emissions inventories and analyses used in attainment demonstrations. Also under the proposal, any stationary source emissions limits developed to implement RACT or RACM would reflect control and measurement of condensable PM.

We received numerous comments on whether these requirements were unreasonable in light of the current state of knowledge of and uncertainties around the measurement of direct $PM_{2.5}$. Most commenters supported the overall view that condensable PM should be addressed in order to provide a complete air quality management program for $PM_{2.5}$. On the other hand, many commenters raised concerns about the availability and implementation of test methods and related issues about the uncertainties in existing data for condensable $PM_{2.5}$. As a result of the concerns, these commenters believed EPA would be premature in requiring a comprehensive evaluation of condensable $PM_{2.5}$, especially as it related to developing any new emissions limits for stationary sources. In recognition of these concerns, the final rule reflects EPA's adoption of a transition period during which we will assess possible revisions to available test methods and we will allow time for States to update emissions inventories as needed to address direct $PM_{2.5}$ emissions. In this section of the preamble, we outline the elements of the final rule addressing inventories reflecting control of direct $PM_{2.5}$. We also discuss the specific comments raised regarding methods for measuring direct $PM_{2.5}$, both filterable and condensable PM, in implementing the rule. The particular comment areas include defining test methods, quantifying direct $PM_{2.5}$ for inventories, and a transition period for developing effective regulations. Below are also our responses to those comments.

b. Final Rule

For the final rule, EPA addresses two broad issues related to inclusion of condensable PM. The first issue is whether emissions inventories and attainment demonstrations should include the condensable portion of direct $PM_{2.5}$ emissions. The second issue is whether direct $PM_{2.5}$ emissions limitations established by States for purposes of RACT and RACM must include limits on condensable PM emissions or limits on total direct $PM_{2.5}$ that includes the condensable PM fraction.

For purposes of developing emissions inventories and attainment demonstrations, the final rule reflects a requirement to account for significant contributors of direct $PM_{2.5}$ emissions, both filterable and condensable $PM_{2.5}$. We recognize that some States have established inventories consistent with requirements of the consolidated emissions reporting rule (CERR) to report direct $PM_{2.5}$ emissions, including condensable PM, in each inventory revision. While uncertainties remain with significant issues to address related to our current knowledge base on condensable PM emissions, we believe that for purposes of emissions inventories and attainment demonstrations, States should continue to describe the impacts of baseline emissions develop future air quality strategies using information available on direct $PM_{2.5}$ emissions including condensable PM.

With respect to developing enforceable emissions limits for condensable PM emissions, we note that some States have established emissions limits or otherwise require PM emissions testing that includes measurement of condensable PM. We recognize that in some States there remain questions about the viability of available test methods, the availability of representative direct $PM_{2.5}$ emissions data, the uncertainty of the methods used to establish inventories, and the short time frame within which States must develop SIPs. In response we have decided to provide a transition period for developing emissions limits and regulations for condensable $PM_{2.5}$. During this transition period, we will provide technical support to States as requested in establishing effective $PM_{2.5}$ emissions limits and corresponding emissions testing requirements.

As described further below, we will devote resources early during this transition period to assessing and improving the available test methods for condensable PM. During this transition period, we will also solicit the involvement of stakeholders with an interest in conducting emissions testing to collect updated direct $PM_{2.5}$ emissions data. The purpose of these stakeholder projects will be to collect new direct filterable and condensable PM emissions data using methodologies that provide data more representative of source direct $PM_{2.5}$ emissions. The EPA, States, and others will use these data to improve emissions factors and to help define or revise source emissions limits in permits and State implementation plans.

The time required for our stakeholders and EPA to complete the test method assessment will limit the degree to which State and local agencies can address effectively the necessary direct $PM_{2.5}$ regulations in inventories and in the 2008 SIP submittals. In recognition of this, we will not require that the emissions limits included in the 2008 submittals account for the condensable fraction of direct $PM_{2.5}$ or to establish limits for total direct $PM_{2.5}$, including condensable PM.

We will expect States to continue developing more complete inventories with regard to direct $PM_{2.5}$ emissions, particularly for condensable PM, during this transition period. We expect no such allowance period for method assessment or data collection to be necessary for implementing regulations addressing precursor $PM_{2.5}$ emissions.

The period of transition for establishing emissions limits for condensable direct $PM_{2.5}$ will end January 1, 2011. We expect States to address the control of direct $PM_{2.5}$ emissions, including condensable PM, with any new actions taken after January 1, 2011. For example, States must address condensable PM emissions in any direct $PM_{2.5}$ emissions limits resulting from midcourse reviews. Additionally, EPA expects that any direct $PM_{2.5}$ regulations or limits developed under any new NAAQS for particulate matter would also address condensable PM emissions.

Notwithstanding the issues and uncertainties related to condensable PM, EPA encourages States to identify measures for reducing condensable PM emissions, particularly where those emissions are deemed significant contributors to the control strategy needed for expeditious attainment. We wish to clarify that in order to take credit in the SIP for reduction of any such condensable PM emissions, there must be enforceable limitations that ensure that reduction in condensable PM emissions. These enforceable limits could take the form of a limitation on the condensable PM emissions or total direct $PM_{2.5}$ emissions (or a commitment to develop such limitations after the end of the transition period described above). Alternatively, these enforceable limitations could provide for enforceable conditions that ensure that the effect on condensable PM emissions is assured (for example, enforceable limitations on operating temperature, or limits on FGD scrubber operations which have the effect of reducing condensable PM emissions).

c. Comments and Responses

We received many comments on quantification of direct $PM_{2.5}$ emissions particularly about the need to conduct further validations for the available test methods, the availability of direct filterable or condensable $PM_{2.5}$ data or lack thereof for representative baselines, and the procedures for applying baseline data for developing effective regulations.

1. Method 202

Comment: A majority of commenters characterized the performance of Method 202 as lacking in reliability. Some commenters characterized the formation of artifacts in Method 202 as significant and the primary reason for their recommendation to defer the inclusion of condensable particulate matter in the baseline assessments and regulatory development for the initial SIPs. The commenters stated that the principal artifact formed when using Method 202 was the result of SO_2 dissolving in the impinger water and converting to sulfuric acid.

Response: We agree that SO_2 in particular, and perhaps other gaseous compounds, can react with the collecting liquids used in the method to form materials (artifacts) that would not otherwise be solid or liquid or would not condense upon exiting the stack. We believe that when Method 202 is applied appropriately (i.e., with the N_2 purge as prescribed), the SO_2 artifact formation is reduced by as much as or more than 90 percent; however, we agree that further verification and refinement would be appropriate to verify the potential for artifact formation.

In response, we are undertaking laboratory studies in collaboration with several stakeholders to characterize the artifact formation and other uncertainties associated with conducting Method 202, and to identify procedures to be used in applying methods to minimize uncertainties. We are involving stakeholders representing industry and State and local agencies in the project design and results review. Stakeholders who have expressed interest in participating in these studies include the Electric Power Research Institute, companies associated with the National Environmental Development Association's Clean Air Project (NEDA/CAP), the Portland Cement Association, the Lime Manufacturing Association, the American Foundry Association, the National Aluminum Association, and several governmental organizations represented by National Association of Clean Air Agencies. Other parties may participate in the study as well.

By the end of 2007, we intend to have conducted a comprehensive laboratory study that examines the relationship between several critical condensable PM sampling and analysis parameters (e.g., SO_2 concentration, moisture concentration, sample duration, and water acidity) and the artifact formation associated with the measurements. One intended result of the project will be identifying possible modifications to Method 202 to minimize and quantify the uncertainties. We will publish the results of the laboratory study along with an assessment of other input and data from stakeholders on the EPA website and, to the extent possible, in a widely circulated peer review journal. Also, to the extent necessary, we intend to propose revisions to the method to incorporate improvements and to clarify application.

2. Conditional Test Methods 039 and 040

Comment: Several commenters cited as a deficiency that neither conditional test method 040 (CTM–040) for measuring filterable $PM_{2.5}$ nor the dilution sampling method (CTM–039) has been thoroughly validated through EPA Method 301. There were also comments that neither of the CTMs was published in the **Federal Register**.

Response: We agree with the comments that neither method has been subjected to adequate public notice and comment rulemaking. Taking that step will facilitate application of the appropriate methods for implementing the SIPs. On the other hand, there are a number of levels of validation already achieved for one or more of these methods that will determine what, if any, additional validation work will be necessary. For example, while we could seek resources to evaluate dilution sampling technology, including CTM–039, and to request public involvement in the project planning, conduct, and review with the possibility of a **Federal Register** proposal, our preference would be to incorporate by reference an approved voluntary consensus test method (e.g., ASTM standard).

We believe that a dilution sampling method for measuring direct $PM_{2.5}$ eliminates essentially all artifact formation and provides the most accurate emissions quantification. To the extent that we need to and can secure resources and stakeholder interest, we plan to perform additional validation testing of CTM–039 or other dilution sampling technologies to characterize the precision of this approach. In conjunction with our validation efforts, we intend to continue participation in the ASTM D22 committee to develop and publish a dilution sampling method and encourage other volunteers on that committee to approve the consensus based dilution sampling method. We believe that this work is nearly complete. As outlined above, we are already undertaking laboratory studies to assess the method and to identify possible modifications to reduce formation of these artifacts. Preliminary laboratory evaluations conducted by EPA and by Environment Canada[47] indicate that additional artifact reductions of 60 to 90 percent may be achieved with other minor modifications to Method 202. These preliminary findings indicate that Method 202 is essentially a viable method that these proposed laboratory studies will serve to enhance. Within 18 months we intend to propose, if necessary, modifications to Method 202 or similar methodologies suitable for measuring condensable $PM_{2.5}$.

As for CTM–040, we believe that further validation of this method is unwarranted since the technology and procedures are based upon the same as evaluated for promulgated Method 201A. Method 201A has undergone public review and comment (55 FR 14246, April 17, 1990). Also, as noted earlier, we have already begun laboratory and data evaluation work the possible result of which would be a revised Method 202 to be proposed in the **Federal Register** to include improvements indicated by the evaluation. At that same time, we may propose CTM–040 to be used in combination with Method 202 for measuring direct $PM_{2.5}$ with additional guidance on appropriate approaches to testing for direct $PM_{2.5}$ emissions from various types of control measures (e.g., electrostatic precipitator and flue gas desulphurization combinations).

3. Role of Condensable PM Emissions in Defining RACT

Comment: Commenters indicated that States must reassess and revise emissions limits if the States adopt methods for measuring direct $PM_{2.5}$ including condensable PM where not required previously. Commenters noted that most existing PM emissions limits are not reflective of data collected with

[47] ''Optimized Method 202 Sampling Train to Minimize the Biases Associated with Method 202 Measurement of Condensable Particulate Matter Emissions,'' John Richards, Tom Holder, and David Goshaw, Air Control Techniques, P.C.; Air & Waste Management Association, Hazardous Waste Combustion Specialty Conference AWM, November 2–3, 2005, St. Louis, MO.

methods that measure condensable or filterable $PM_{2.5}$ and, therefore, not enforceable using a new or different test method.

Response: We agree that coordinating the test method with the pollutant defined by the emissions limit is critical to an effective regulation. In the case of direct $PM_{2.5}$ regulations, the methods for measuring filterable and condensable PM provide data that are significantly different than do methods often used in implementing many current regulations (i.e., filterable plus condensable $PM_{2.5}$ versus filterable PM only). The existing PM emissions regulations implementing many current SIPs have focused almost exclusively on filterable PM at stack conditions or other elevated temperatures (e.g., 250 °F) with little or no measurement of condensable PM, let alone filterable $PM_{2.5}$. These deficiencies exist in spite of the Agency's policies and guidance presented in documents such as the 1987 PM_{10} SIP Development Guideline [48] and the General Preamble for the Implementation of Title 1 of the Clean Air Act Amendments of 1990 [49] issued in 1992. These documents set forth Agency policy stating that direct PM_{10} and direct $PM_{2.5}$ emissions include both filterable and condensable particulate matter. The policies are reinforced by a 2005 directive from the CAA Advisory Committee.[50]

More to the point, the use of test methods that quantify only filterable PM would limit the capability of any assessment of control measures available for developing cost effective strategies to achieve attainment of the $PM_{2.5}$ NAAQS. Examples include an attainment demonstration that includes control methodologies for PM precursors which are likely to result in a significant decrease in the emissions of direct $PM_{2.5}$ (for example, alkaline scrubbers to reduce SO_2 emissions) and incorporate these direct $PM_{2.5}$ emissions reductions in their attainment demonstration or allow for the use of these reductions as credits for other programs.

Some States may decide to measure and control condensable PM emissions prior to the end of the transition period. To the extent that a State has the supporting technical information and test methods, the State may also assess the capabilities of current control technologies, possible modifications to such technologies, or new technologies as appropriate relative to control of condensable $PM_{2.5}$ emissions in developing effective control strategies and regulations. As an example, a specific approach for controlling condensable PM could be a change in control device operating temperature to achieve necessary emissions reductions. We also note that it is important that implementation of any new or revised rules and test methods should be prospective and clearly differentiated from existing regulations to avoid confusion over status of compliance relative to existing PM emissions limits.

4. Sufficiency of Current Baselines Relative to Direct $PM_{2.5}$ for Regulatory Development

Comment: Many commenters indicated that the currently available baselines for direct $PM_{2.5}$ emissions are not sufficient for States to develop effective emissions control regulations. One commenter claimed that States will need additional information regarding how to arrive at enforceable $PM_{2.5}$ emissions limitations through application of correlations to existing PM_{10} emissions limitations.

Response: We agree that State inventories accounting for direct $PM_{2.5}$ emissions are important to the NAAQS implementation decision-making process. For example, the current national emissions inventories have characterized the contribution of the condensable PM emissions to range from 40 to 80 percent of the direct $PM_{2.5}$ emissions particularly from combustion source categories. We also agree in many cases, the emissions baselines are not sufficiently representative of significant direct $PM_{2.5}$ contributors to allow States to develop effective and enforceable emissions limitations for sources that may require control of direct filterable or condensable $PM_{2.5}$ emissions in order for States to come into attainment with the $PM_{2.5}$ NAAQS.

We note that States are already required under the consolidated emissions reporting rule (CERR) to report direct $PM_{2.5}$ emissions, including condensable PM, in each inventory revision. That means that inventories and associated baselines must address sources and contributions of direct $PM_{2.5}$ emissions, both filterable and condensable PM, from individual sources and groups of sources as well as for future year projected emissions. These data are important for the purposes of calculating emissions reductions and demonstrating that such reductions are attributable to the control measures being implemented.

In taking the process to the next step, we contend that many current baselines established using the available direct filterable and condensable $PM_{2.5}$ national industry average emissions factors (e.g., those found in AP–42 and WebFIRE, *http://www.epa.gov/ttn/chief/efpac/index.html*) often are of quality insufficient to establish effective source-specific emissions limits. First, national industry average emissions factors are subject to significant uncertainties as they usually represent data from a very limited number of example facilities in a category and for a very limited number of operating conditions. Second, the available emissions factors databases may not include direct $PM_{2.5}$ emissions data for specific source types that appear in some State and local inventories.

In short, we believe that States should rely on directly measured emissions data in developing source category or pollutant-specific emissions limits for regulations. This approach is preferable to the use of these national industry average emissions factors such as those found in AP–42. If there are no directly measured emissions data available from the subject sources, national average emissions factors should be used only with appropriate and significant adjustments for uncertainty. Based on our initial study [51] of the uncertainties associated with national average emissions factors when applied to site-specific or rule-development activities, we would expect multipliers of 0.1 to 3.3 for an A-rated national average filterable and condensable direct $PM_{2.5}$ emissions factors. The level of a particular multiplier would depend on how representative of the source category the applicable emissions factor is, the quantity of data supporting that emissions factor, and the specific application. Determining what adjustment may apply for a particular application requires detailed knowledge of the emissions control variability, the expected range of operational and process variability, and the statistical uncertainty in the measured emissions data. While more general adjustments to emissions factors are possible for these purposes, we believe that the better approach is to improve and update the emissions factors used in the database for a particular area with measured

[48] U.S. Environmental Protection Agency. PM–10 SIP Development Guideline. Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA Publication No. EPA–450/2–86–001. June 1987.

[49] The General Preamble is available online at *http://www.epa.gov/ttn/oarpg/t1pfpr.html.*

[50] Clean Air Act Advisory Committee, Recommendations to the Clean Air Act Advisory Committee—Phase I and Next Steps, Air Quality Management Work Group, Environmental Protection Agency, *http://www.epa.gov/air/caaac/pdfs/report1-17-05.pdf*, January 2005.

[51] Option Paper 4—Providing Guidance Regarding The Use Of Emissions Factors For Purposes Other Than Emissions Inventories, September 2005, *http://www.epa.gov/ttn/chief/efpac/projects.html.*

direct $PM_{2.5}$ emissions data. For these reasons and to allow time for data collection and analysis, we have determined the need for a period of transition for States in developing direct $PM_{2.5}$ emissions reduction strategies.

5. Transition Period

Comment: Some commenters suggested that EPA should allow States to base their initial 2008 SIPs on NO_X, SO_2, and filterable PM or PM_{10} (as a surrogate for filterable $PM_{2.5}$) rather than require State and local agencies to develop direct $PM_{2.5}$ emissions regulations immediately. Commenters suggested that EPA provide a transition period for sources to adopt SIPs that address direct $PM_{2.5}$ and to apply the appropriate test methods. The commenters proposed that during this transition period, a source should be able to continue to use Method 5, Method 17, or whatever method was used to set the underlying limit contained in the source's title V operating permit. Commenters believe that such a transition plan must provide additional time to collect data related to condensable PM emissions. Commenters believe that this additional time is necessary because it is unrealistic to develop SIP revisions addressing condensable emissions by April 2008. Other commenters suggested that source emissions inventories used for regulatory decision-making and identifying regulatory control measures must be based on accurate measurements.

Response: As outlined above, we agree that a transition period should be allowed to allow time to resolve and adopt appropriate testing procedures for condensable PM emissions, to collect total (filterable and condensable) $PM_{2.5}$ emissions data that are more representative of the sources in their areas, and develop effective regulations for control of direct $PM_{2.5}$, including condensable PM.

6. Data Collection for Regulatory Development

Comment: Several commenters recommended that EPA should be responsible for developing data of emissions from common sources of direct $PM_{2.5}$.

Response: We disagree with the commenters' recommendation that EPA should be primarily or solely responsible for developing baseline data on common sources of direct $PM_{2.5}$ emissions. Commenters are suggesting that we should collect data representative of direct $PM_{2.5}$ emissions from source categories potentially subject to regulation of direct $PM_{2.5}$ emissions. Furthermore, they suggest that we expand or improve the current compilation of national industry average emissions factors such as found in AP–42 and WebFIRE (*http://www.epa.gov/ttn/chief/efpac/index.html*). Given the limited extent to which national industry average emissions factors are suitable for developing State or local regulations that set limits on direct $PM_{2.5}$ emissions, we believe that it is inherent that States instead have primary responsibility for reviewing and applying measured emissions data collected from their sources in enhancing their current baselines. In some cases, this will mean that States and other stakeholders will need to conduct more focused direct $PM_{2.5}$ emissions data collection and improve relevant emissions factors.

This approach is appropriate for several reasons. First, we believe that stakeholders other than EPA are better equipped to identify specific data needs and that they have the means to collect the data. Second, we believe we are better positioned to provide guidance on test planning, data collection, and emissions factors calculations with a less direct role in data collection and evaluation. Third, we believe that States in need of additional information can also benefit from experience of other States with similar source types and who are developing regulations to implement the NAAQS including the control of condensable PM. See also the discussion in section II.L.2.c.1 above on the currently active collaborative study to assess direct $PM_{2.5}$ emissions measurement technologies and to collect updated direct $PM_{2.5}$ emissions data.

7. Developing Effective Regulations for Direct $PM_{2.5}$, Including Condensable PM, Emissions

Most current PM regulations focus on the control and measurement of filterable PM emissions and do not account for condensable PM emissions. At issue are assessing and accounting for the differences in methodology and applicable limits when changing to a program designed to achieve reductions in $PM_{2.5}$ emissions, including condensable PM.

Comment: A number of respondents commented that EPA needs to promulgate a $PM_{2.5}$ test method and adopt regulatory language that determines the $PM_{2.5}$ limits based on that promulgated $PM_{2.5}$ test method as soon as possible. Other commenters suggested that EPA and States have no choice but to revise the underlying standard by adopting new monitoring requirements through a notice and comment rulemaking. Further, these commenters indicate that it is essential that EPA require that no change in a test method or in methods of monitoring for determining compliance until such time as EPA or the permitting agency have undertaken a notice and comment process to determine how the emissions limitations must be revised. A number of commenters cited specific components necessary for effective regulations.

Response: We agree that notice and comment rulemaking is appropriate for establishing effective regulations. As noted above, we are already undertaking a study of the available test methods to determine the need for regulatory revisions. We also agree that new regulations limiting direct $PM_{2.5}$ emissions must include effective emissions limitations to the extent that a State must reduce sources of direct $PM_{2.5}$. How a State determines to take such regulatory action depends on the State's implementation plan. Regarding the specific components necessary for effective regulations, see section O below on enforcement and compliance issues.

M. Improving Source Monitoring

a. Background

In the November 1, 2005 proposal, we discussed a number of actions the EPA would undertake to improve the effectiveness of existing and new regulations with improved source monitoring provisions. Specifically, we repeated a plan outlined on January 22, 2004 (69 FR 3202; a **Federal Register** notice describing requirements for monitoring in operating permits), that includes a four-part strategy for improving monitoring of emissions at the source where necessary through rulemaking. One element of that plan is for EPA to develop guidance on how States can reduce $PM_{2.5}$ emissions by improving source monitoring related to $PM_{2.5}$ emissions limits. We noted that we expect to describe in such guidance methods of improving monitoring frequency or adopting more appropriate monitoring for States to consider in developing their $PM_{2.5}$ SIPs and to illustrate the amount of credit that States could receive in $PM_{2.5}$ SIPs for adopting such improved monitoring. We suggested that States with areas where additional reductions are needed to help the area achieve compliance with the NAAQS could implement improved monitoring measures to obtain additional emissions reductions. We put forward that State agencies could receive SIP credits as a result of enforceable improved monitoring or

voluntary emissions monitoring programs meeting EPA voluntary program policies.

Specific examples of improved monitoring we outlined included: (1) Conducting the currently required monitoring more frequently (i.e., increased monitoring frequency), (2) changing the monitoring technique to a parameter more closely related to control of direct or precursor $PM_{2.5}$ emissions (i.e., a correlated parametric monitoring technique), (3) changing the technique to more measurement of direct $PM_{2.5}$ emissions and $PM_{2.5}$ precursors, or (4) a combination of these improvements. These types of monitoring improvements could be conducted for both controlled and uncontrolled emissions units. The improved monitoring control measure would require facilities to pay more attention to the operation of add-on air pollution control devices, work practices, and other control measure activities. The additional attention will reduce periods during which control devices and other control measures do not operate as intended or required. The result would be increased emissions reductions from implementing existing and new rules.

We discussed a range of currently applied and new monitoring technologies. We addressed concerns we have about the limitations of the widespread use of visual emissions (VE) monitoring techniques, such as visible emissions checks, to show compliance with PM emissions limits. We noted particular concerns about VE approaches, even with frequent application, having the ability to verify compliance when the margin of compliance is small or the ability to detect relatively significant changes in emissions control performance. The other concern we noted about the use of VE tools is the limited frequency at which they are conducted. We cited studies on the availability of continuous instrumental methods for monitoring opacity and operational parameters closely related to PM control levels including the development of repeatable correlations between parameter levels and PM emissions. We noted that PM continuous emissions monitoring systems (PM CEMS) technology provides the opportunity to quantify PM emissions levels (concentration or emissions rates). These additional data provide the source owner/operator with a level of information that can be useful for understanding and operating the process and the control measures in ways to minimize emissions, improve operating efficiencies, and reduce enforcement liabilities. Furthermore, we noted that this technology will provide the State with quantitative information on PM emissions which will help improve the inventories and to implement effective control strategies to meet the NAAQS.

We also discussed at some length what we believe constitutes improved monitoring and the potential for monitoring-related emissions reductions. We discussed a study of how these emissions reductions would be achieved by increasing the monitoring frequency or improving the monitoring of an add-on air pollution control device or other process activity above the level currently required in existing rules. The increased frequency or improved technique would allow owners or operators to achieve greater emissions reductions by identifying and responding more quickly to periods of ineffective control measure operation. States could use an improved monitoring control measure in regulations or through other means to reduce emissions levels and receive credits towards attainment. Specifically, we cited materials that indicate that source owners and operators who increase monitoring frequency could achieve emissions reductions up to 13 percent and those who improve the monitoring technique could achieve emissions reductions up to 15 percent. States with nonattainment areas in need of additional reductions to achieve compliance with the NAAQS could implement an improved monitoring measure and develop additional emissions reductions credits. We outlined several specific examples.

In order to inform our improved monitoring guidance development efforts, we used the 2005 proposal to solicit specific comments on (1) how potentially inadequate source monitoring in certain SIPs could be improved; (2) how improved $PM_{2.5}$ monitoring relates to title V monitoring; (3) whether instrumental techniques are more appropriate than visual emissions (VE) techniques for monitoring compliance with PM emissions limits; and (4) a basis for determining whether improved monitoring would be effective and under what conditions should be required. We also requested comment on the feasibility of monitoring of co-pollutant control measures and requested examples of improved monitoring for any applications.

b. Final Rule

We maintain that improved monitoring is critical to implementing the $PM_{2.5}$ direct and precursor emissions reductions programs. We also believe that improving monitoring both in terms of increasing data collection and analysis frequency and in measuring the pollutant of interest more directly will accomplish several important and advantageous outcomes. First, improved monitoring will improve verification of compliance and assurance of the intended emissions reductions. Second, improved monitoring can provide additional emissions reductions through quicker detection and correction of control measure problems. Third, improved monitoring can improve operating efficiencies that often result in cost savings to the facility exceeding the cost of the monitoring. We will continue to evaluate the effects of improved monitoring on emissions reductions and ways to quantify the benefits associated with improved monitoring.

We intend to move forward with developing and providing additional technical and informational materials regarding technologies constituting improved monitoring and for developing regulations with improved monitoring. These materials may also include guidance and tools for establishing emissions reductions credits and the economic benefits associated with improved monitoring. As noted in section L above, we also reaffirm our policy that effective regulations must include certain elements that define applicable emissions limitations, the testing and monitoring requirements, and compliance, reporting, and corrective action obligations.

c. Comments and Responses

We expected to receive practical advice concerning improved $PM_{2.5}$ source emissions monitoring methods and field-tested examples. Instead, commenters focused on (1) critiquing PM CEMS technology (2) insisting that improving monitoring changes stringency of existing rules and requires rulemaking, and (3) critiquing the theoretical study linking emissions reductions with improved monitoring.

1. Currently Available PM CEMS for Monitoring Direct $PM_{2.5}$ Emissions

Comment: Commenters noted that because currently available PM CEMS measure filterable PM at stack conditions or at other elevated temperatures, the instruments do not measure the condensable portion of $PM_{2.5}$.

Response: We agree with this comment relative to PM CEMS in use to date and the ability to detect condensable PM. PM CEMS as applied today can be calibrated to measure filterable $PM_{2.5}$ emissions with very good sensitivity and repeatability. Note

that we are aware of a number of PM CEMS vendors developing devices relying on much the same technology but modified to measure condensable PM. Further, we are aware of at least one manufacturer offering a PM CEMS applicable to stationary sources that also complies with ASTM requirements for mobile source emissions monitoring. We also believe that monitoring for filterable $PM_{2.5}$ will be as important in some cases as monitoring for condensable PM and that PM CEMS in use today are markedly better at monitoring PM emissions than other frequently used monitoring approaches.

We realize that PM CEMS represent just one of a range of monitoring options that constitute improvements over the current monitoring. For instance, we believe that improved monitoring would include replacing current periodic VE measurements or daily recording of pressure drop of fabric filters with continuous bag leak detectors. We know of projects (e.g., ASTM committee work) for continuing the development of optical, as well as electromagnetic, monitoring tools to increase sensitivity and cost-effectiveness. Such monitoring would increase monitoring frequency and would yield data much more closely related to and more sensitive to control device operation than most currently applied monitoring. To the extent that condensable PM control is critical in implementing a regulation, we believe that monitoring must address that need. We will continue to collect and also provide information on source monitoring approaches that are improvements over current methods in both frequency and representativeness relative to implementing $PM_{2.5}$ emissions control strategies.

2. Status of Guidance Relative to Regulations

Comment: A significant majority of commenters suggested that improving monitoring in an existing regulation increases its stringency and requires notice and comment rulemaking, not guidance. Just one commenter suggested guidance could be developed and used.

Response: There are two aspects to the comments on this issue. One is whether improved monitoring would change source operations. We agree with the commenters that increasing the frequency of data collection or providing data more directly related to the pollutant of concern with improved monitoring could result in changes in how a facility is operated relative to compliance. We disagree with commenters that such changes in process operation resulting from improved monitoring constitute an increase in a regulation's stringency with respect to compliance. First, as mentioned in the preamble to the Credible Evidence rule (62 FR 8326, February 24, 1997), an emissions standard's required stringency is unaffected by the frequency of monitoring given no decrease in averaging time or emissions limitation. Secondly, data from improved monitoring will provide a facility operator better information on control measure performance more quickly and allow for reducing the duration and the number of periods that may lead to compliance problems. Reducing the duration of excess emissions periods, for example, with improved monitoring is not an increase in regulatory stringency but a decrease in enforcement liability.

The second aspect to the comment is questioning whether we can issue technical information about improved monitoring as guidance without applying it to a **Federal Register** notice and comment process. We disagree with commenters who believe that our developing and disseminating technical resource information is limited to notice and comment rulemaking. We note that making technical and other information materials available to the public, states, and industry is an important Agency function. There are many examples of the Agency dispensing such information including the Monitoring Knowledge Base (*http://cfpub.epa.gov/mkb/*) that provides just such information on improved monitoring. On the other hand, we agree with commenters that any significant change to an existing regulation, including the addition of new monitoring requirements, would be subject to notice and comment rulemaking. To the extent that States determine the need for changing existing or developing new regulations, public notice and comment rulemaking is appropriate. Our role in developing technical resources and information informing the states in developing those revised or new regulations does not require, nor should be subject to the rulemaking process. In that light, we recognize the value in obtaining and responding to public comments and suggestions on informative technical materials. Further, we believe rulemaking is not necessarily required for source owners or operators who volunteer to participate in an optional improved monitoring program, such as the one mentioned in the proposal. That program seeks to provide SIP credits to States where source owners or operators agree to improve their PM monitoring approaches. We plan on continuing to prepare and offer non-regulatory incentives for source owners and operators who volunteer to improve existing monitoring.

3. Study of Improved Monitoring-Induced Emissions Reductions

Comment: Commenters recommended that the proposal's theoretical study showing PM emissions reductions from the use of improved monitoring needs to be validated with field data.

Response: We agree with commenters that one should base any costs and benefits findings as well as validating the approach on available data. To the extent that this applies to assessing the benefits of emissions reductions achieved through improved monitoring, we requested that commenters provide data or leads to other information or to other alternatives that show how improved monitoring yields emissions reductions and ways to quantify possible PM credits for SIPs. In fact, we are disappointed that commenters failed to provide these data or examples of other approaches. As resources allow, we will investigate opportunities for field validation of the theoretical study, as well as other means to offer incentives for use of improved monitoring.

N. Guidance Specific to Tribes

a. Background

The proposal set forth guidance for Tribes regarding various aspects of air quality management, and this guidance remains largely the same as described in the section below.

b. Final Rule

The 1998 Tribal Authority Rule (TAR) (40 CFR part 49), which implements section 301(d) of the CAA, gives Tribes the option of developing tribal implementation plans (TIPs). Specifically, the TAR provides for the Tribes to be treated in the same manner as a State in implementing sections of the CAA. However, Tribes are not required to develop implementation plans. The EPA determined in the TAR that it was inappropriate to treat Tribes in a manner similar to a State with regard to specific plan submittal and implementation deadlines for NAAQS-related requirements, including, but not limited to, such deadlines in CAA sections 110(a)(1), 172(a)(2), 182, 187, and 191. (Add footnote) See 40 CFR 49.4(a). In addition, EPA determined it was not appropriate to treat tribes similarly to states with respect to provisions of the CAA requiring as a condition of program approval the demonstration of criminal enforcement

authority or providing for the delegation of such criminal enforcement authority. See 40 CFR 49.4(g). To the extent a tribe is precluded from asserting criminal enforcement authority, the Federal government will exercise primary criminal enforcement responsibility. See 40 CFR 49.8. In such circumstances, tribes seeking approval for CAA programs provide potential investigative leads to an appropriate federal enforcement agency. (end footnote)

If a Tribe elects to do a TIP, we will work with the Tribe to develop an appropriate schedule which meets the needs of the Tribe, and which does not interfere with the attainment of the NAAQS in other jurisdictions. The Tribe developing a TIP can work with the EPA Regional Office on the appropriateness of addressing RFP and other substantive SIP requirements that may or may not be appropriate for the Tribe's situation.

The TAR indicates that EPA is ultimately responsible for implementing CAA programs in Indian country, as necessary and appropriate, if Tribes choose not to implement those provisions. For example, an unhealthy air quality situation in Indian country may require EPA to develop a FIP to reduce emissions from sources on the reservation. In such a situation, EPA, in consultation with the Tribe and in consideration of their needs, would work to ensure that the NAAQS are met as expeditiously as practicable. Likewise, if we determine that sources in Indian country could interfere with a larger nonattainment area meeting the NAAQS by its attainment date, we would develop a FIP for those sources in consultation with the Tribe, as necessary or appropriate.

The TAR also provides flexibility for the Tribe in the preparation of a TIP to address the NAAQS. If a Tribe elects to develop a TIP, the TAR offers flexibility to Tribes to identify and implement on a Tribe-by-Tribe, case-by-case basis only those CAA programs or program elements needed to address their specific air quality problems. In the proposed Tribal rule, we described this flexible implementation approach as a modular approach. Each Tribe may evaluate the particular activities, including potential sources of air pollution within the exterior boundaries of its reservation (or within non-reservation areas for which it has demonstrated jurisdiction), which cause or contribute to its air pollution problem. A Tribe may adopt measures for controlling those sources of $PM_{2.5}$-related emissions, as long as the elements of the TIP are reasonably severable from the package of elements that can be included in a whole TIP. A TIP must include regulations designed to solve specific air quality problems for which the Tribe is seeking EPA approval, as well as a demonstration that the Tribal air agency has the authority from the Tribal government to develop and run their program, the capability to enforce their rules, and the resources to implement the program they adopt. In addition, the Tribe must receive an eligibility determination from EPA to be treated in the same manner as a State and to receive authorization from EPA to run a CAA program.

The EPA would review and approve, where appropriate, these partial TIPs as one step of an overall air quality plan to attain the NAAQS. A Tribe may step in later to add other elements to the plan, or EPA may step in to fill gaps in the air quality plan as necessary or appropriate. In approving a TIP, we would evaluate whether the plan interferes with the overall air quality plan for an area when Tribal lands are part of a multi-jurisdictional area. Because many of the nonattainment areas will include multiple jurisdictions, and in some cases both Tribal and State jurisdictions, it is important for the Tribes and the States to work together to coordinate their planning efforts. States need to incorporate Tribal emissions in their base emission inventories if Indian country is part of an attainment or nonattainment area. Tribes and States need to coordinate their planning activities as appropriate to ensure that neither is adversely affecting attainment of the NAAQS in the area as a whole.

c. Comments and Responses

No public comments were received on this section.

O. Enforcement and Compliance

a. Background

The proposed rule included a discussion of the specific requirements that must be addressed in order for SIP regulations to be enforceable.

b. Final Rule

The final rule includes similar guidance on enforceable SIP regulations, with some additional discussion about specific elements that must be addressed regarding compliance testing and compliance monitoring. (Note that enforceable SIP regulations may address these key elements in different ways depending on the type of source category being regulated.)

In general, for a SIP regulation to be enforceable, it must clearly spell out which sources or source types are subject to its requirements and what its requirements (e.g., emission limits, work practices, etc.) are. The regulation also needs to specify the time frames within which these requirements must be met, and must definitively state recordkeeping and monitoring requirements appropriate to the type of sources being regulated. The recordkeeping and monitoring requirements must be sufficient to enable the State or EPA to determine whether the source is complying with the emission limit on a continuous basis. An enforceable regulation must also contain test procedures in order to determine whether sources are in compliance.

Complete and effective regulations that ensure compliance with an applicable emissions limit must include requirements for both performance testing of emissions and ongoing monitoring of the compliance performance of control measures. SIP regulations must include the following critical elements of regulatory compliance testing:

- Indicator(s) of compliance—the pollutant or pollutants of interest (e.g., filterable $PM_{2.5}$ plus condensable $PM_{2.5}$) and the applicable measurable units for expressing compliance (e.g., ng/J of heat input, lb/hr);
- Test method—reference to a specific EPA or other published set of sample collection and analytical procedures, equipment design and performance criteria, and the calculations providing data in units of the indicator of compliance (see section II.L. below for descriptions of available and potential improved test methods);
- Averaging time—the minimum length of each required test run and the requirement to average the results of the test runs (e.g., three runs) representing a specified period of time (e.g., 8 hours); and
- Frequency—the maximum time between conduct of emissions or performance tests (e.g., within 30 days of facility start-up and once each successive quarter, every 6-month period, yearly).

In order to be complete with regard to compliance monitoring provisions, SIP regulations must include the following critical elements:

- Indicator(s) of performance—the parameter or parameters measured or observed for demonstrating proper operation of the pollution control measures or compliance with the applicable emissions limitation or standard. Indicators of performance may include direct or predicted emissions measurements, process or control device (and capture system) operational

parametric values that correspond to compliance with efficiency or emissions limits, and recorded findings of verification of work practice activities, raw material or fuels pollutant content, or design characteristics. Indicators may be expressed as a single maximum or minimum value, a function of process variables (e.g., within a range of pressure drops), a particular operational or work practice status (e.g., a damper position, completion of a waste recovery task), raw material or fuel pollutant content, or an interdependency between two or more variables;

• Measurement technique—the means used to gather and record information of or about the indicators of performance. The components of the measurement technique include the detector type or analytical method, location and installation specifications, inspection procedures, and quality assurance and quality control measures. Examples of measurement approaches include continuous emissions monitoring systems, continuous opacity monitoring systems, continuous parametric monitoring systems, performance testing, vendor or laboratory analytical data, and manual inspections and data collection that include making records of process conditions, raw materials or fuel specifications, or work practices;

• Monitoring frequency—the number of times to obtain and record monitoring data over a specified time interval. Examples of monitoring frequencies include at least one data value every 15 minutes for continuous emissions or parametric monitoring systems, at least every 10 seconds for continuous opacity monitoring systems, upon receipt or application of raw materials or fuel to the process, and at least once per operating day (or week, month, etc.) for performance testing, work practice verification, or equipment design inspections; and

• Averaging time—the period over which to average and use data to verify compliance with the emissions limitation or standard or proper operation of the pollution control measure. Examples of averaging time include a 3-hour average in units of the emissions limitation, a 30-day rolling average emissions value, a daily average of a control device operational parametric range, periodic (e.g., monthly, annual) average of raw materials or fuel pollutant content, and an instantaneous alarm.

These regulatory elements are essential for effective implementation of the rules and clear and enforceable applicable requirements. We believe that approval of regulations implementing the SIPs must ensure that these critical elements are present and clearly defined to be approvable. We reiterate that the compliance obligations, including emissions limits and other applicable requirements, must be representative of and accountable to the assumptions used in the SIP demonstration. This accountability includes the ability to transfer the applicable regulatory requirements to an operating permit subject to EPA and public review.

Under the Title V regulations, sources have an obligation to include in their Title V permit applications all emissions for which the source is major and all emissions of regulated air pollutants. The definition of regulated air pollutant in 40 CFR 70.2 includes any pollutant for which a NAAQS has been promulgated, which would include both PM_{10} and $PM_{2.5}$. To date, some permitted entities have been using PM_{10} emissions as a surrogate for $PM_{2.5}$ emissions. Upon promulgation of this rule, EPA will no longer accept the use of PM_{10} as a surrogate for $PM_{2.5}$. Thus, sources will be required to include their $PM_{2.5}$ emissions in their Title V permit applications, in any corrections or supplements to these applications, and in applications submitted upon modification and renewal.[52] The degree of quantification of $PM_{2.5}$ emissions required will depend on the types of determinations that a permitting authority needs to address for a particular source, the requirements of title V, and the informational needs and requirements of the particular State in question. Sources must continue to describe their PM_{10} emissions in their applications as indicated above because the original PM_{10} NAAQS remains in effect.

c. Comments and Responses

Comment: One commenter disagreed with language in the preamble to the proposal regarding Title V permitting requirements and the requirement to include various emissions information in title V permit applications. As described in 40 CFR 70.5(c)(3)(i) and 71.5(c)(3)(i), sources are required to include in their permit applications all emissions for which the source is major and all emissions of regulated air pollutants. In the preamble to the proposal, the EPA stated that in the past some permitted entities have been using PM_{10} emissions as a surrogate for $PM_{2.5}$ emissions in permit applications, or in corrections or supplements to applications. The EPA stated that upon promulgation of this rule, the EPA will no longer accept the use of PM_{10} as a surrogate for $PM_{2.5}$.

The commenter disagreed with language in the proposal stating that sources would be required to detail or quantify $PM_{2.5}$ emissions in permit applications, or in corrections or supplements to applications. The commenter asserts that the inclusion of $PM_{2.5}$ emissions information is required in a Title V permit application only if there is an applicable requirement in existence for which the source's applicability is in question and cited to various examples from the memorandum entitled ''White Paper for Streamlined Development of Part 70 Permit Applications,'' from Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, to Air Division Directors, Regions I–X, dated July 10, 1995.

Response: The commenter is concerned that as a result of this rule all applications (including initial, modification, and renewal applications) will need to include a quantification of $PM_{2.5}$ emissions, and that a State will request that every source supplement or correct any existing title V application in order to provide an estimation of $PM_{2.5}$ emissions at the source.

The EPA is not implying that this is the case. The degree of quantification of $PM_{2.5}$ emissions required in an application (including an initial, modification, or renewal application), or in a correction or supplement to an existing application, depends on the types of determinations that a permitting authority needs to address for a particular source, the requirements of title V, and the informational needs and requirements of the particular State in question. For example, if a source which emits $PM_{2.5}$ emissions has submitted a title V application, but a draft permit has not yet been issued, then the source is required to submit information relative to the quantification of its $PM_{2.5}$ emissions if such information is needed or requested and it has not previously submitted such information. See 40 CFR 70.5(b) and 71.5(b).

Circumstances necessitating the quantification of $PM_{2.5}$ emissions and the submittal of this information include: (1) Determining all of the pollutants for which a source is major; (2) determining whether an applicable requirement or program applies, e.g., determining the applicability of a SIP requirement or a PSD or nonattainment NSR program, etc.; or (3) determining what fees a source owes a permitting

[52] See 40 CFR 70.5(c)(3)(i), 70.5(b), and 70.7(a)(1)(i); 40 CFR 71.5(c)(3)(i), 71.5(b), and 71.7(a)(1)(i).

authority as a result of considering $PM_{2.5}$ emissions.

In all circumstances, however, a State may require that a source quantify its $PM_{2.5}$ emissions information in an application, supplement, or correction, even if it is not needed for the particular determination at issue. The State, for example, may choose to obtain this information for air quality planning purposes, developing emission inventories, or for other purposes related to its air quality management goals. Requesting such emissions information is an option for any title V permitting authority.

The ''White Paper for Streamlined Development of Part 70 Permit Applications,'' referenced by the commenter, was a confirmation of EPA policy with respect to the fact that the specificity of emissions quantification can vary significantly, depending on the circumstances of a particular source. It is also important to note that this guidance document is a statement regarding the range of discretion available to permitting authorities in implementing the emissions quantification requirement, not a restriction of that discretion to minimum practices. Thus, States can implement this guidance document at their option, either in part or in its entirety.

In summary, the purpose of the statements made in the preamble to the proposal was to notify sources that as of the promulgation of this final rule, the EPA will no longer accept the use of PM_{10} emissions information as a surrogate for $PM_{2.5}$ emissions information [53] given that both pollutants are regulated by a National Ambient Air Quality Standard and therefore are considered regulated air pollutants. See the definition of regulated air pollutant in 40 CFR 70.2 and 71.2.[54] The degree of quantification of $PM_{2.5}$ emissions now required in an application (including an initial, modification, or renewal application), or provided in a correction or supplement to an existing application, will depend on the types of determinations that a permitting authority needs to address for a particular source, the requirements of title V, and the informational needs and requirements of the particular State in question.

P. Emergency Episodes

a. Background

In the proposal, we noted that subpart H of 40 CFR part 51 specifies requirements for SIPs to address emergency air pollution episodes and for preventing air pollutant levels from reaching levels determined to cause significant harm to the health of persons. We noted that we anticipate proposing a separate rulemaking in the future to update portions of that rule. The preamble to the proposal

b. Final Rule

We have not yet proposed any rule revision related to emergency episodes.

c. Comments and Responses

We received no comments on this section of the proposal.

Q. Ambient Monitoring

a. Background

Ambient air quality monitoring for $PM_{2.5}$ plays an important role in identifying areas violating the NAAQS, control strategy development, and tracking progress to attainment. We indicated in the proposal that States are required to monitor $PM_{2.5}$ mass concentrations using Federal Reference Method devices to determine compliance with the NAAQS.[55] We did not propose any revisions to current ambient monitoring requirements listed in 40 CFR part 58. Currently, there are more than 1200 FRM monitors located across the country. States will need to maintain monitors in designated nonattainment areas in order to track progress toward attainment and ultimately determine whether the area has attained the $PM_{2.5}$ standards.

In addition to the FRM network, EPA and the States have also deployed more than 250 speciation monitoring sites around the country to sample for chemical composition of $PM_{2.5}$. The data provided from these speciation monitors are invaluable in identifying contributing source categories and developing control strategies to reach attainment. Source apportionment and other receptor modeling techniques rely on the detailed data on species, ions, and other compounds obtained from chemical analysis. Analyses of rural versus urban sites to identify which $PM_{2.5}$ components comprise the ''urban excess'' (urban minus rural levels) portion of $PM_{2.5}$ mass also rely on data from speciation monitors. The EPA encourages states to expand their data analysis efforts using the wealth of information provided from the speciation monitoring network.

b. Final Rule

There is no change from the proposal. We are not promulgating any additional monitoring requirements as part of this rulemaking. Revised monitoring regulations were issued in 2006 along with the revised PM NAAQS.

c. Comments and Responses

There were no comments on this section.

III. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under section 3(f)(1) of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is an ''economically significant regulatory action.'' Implementation of the $PM_{2.5}$ NAAQS is likely to have an annual effect on the economy of $100 million or more. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action. For clarity, we note that the estimated costs and benefits of implementing the 1997 $PM_{2.5}$ NAAQS are not created by this rule, because the Clean Air Act requires state implementation of the 1997 $PM_{2.5}$ standards (through state development of plans with enforceable requirements for sources) on a statutory timetable regardless of whether EPA issues this rule interpreting the statutory requirements. The rule reflects the statutory requirements.

As part of the ''Regulatory Impact Analysis for Particulate Matter National Ambient Air Quality Standards (September 2006),'' EPA prepared an assessment of the estimated costs and benefits associated with attaining the 1997 $PM_{2.5}$ NAAQS in 2015, incremental to currently promulgated federal and state programs including for example the Clean Air Interstate Rule, the Nonroad Diesel Rule, and other programs. This analysis is included as Appendix A of the report and is available in the docket for this action and on EPA's Web site at: *http://www.epa.gov/ttn/ecas/regdata/RIAs/Appendix%20A—2015%20Analysis.pdf.* This illustrative

[53] For background information on issues surrounding implementation of the $PM_{2.5}$ NAAQS, see the EPA memo entitled ''Implementation of New Source Review Requirements in $PM_{2.5}$ Nonattainment Areas,'' from Stephen D. Page, Director, Office of Air Quality Planning and Standards, to Regional Air Directors, Regions I–X, dated April 5, 2005.

[54] For background information on regulated air pollutants, see the EPA memo entitled ''Definition of Regulated Air Pollutant for Purposes of Title V,'' from Lydia N. Wegman, Deputy Director, Office of Air Quality Planning and Standards, to Air Division Directors, Regions I–X, dated April 26, 1993.

[55] The $PM_{2.5}$ monitoring regulations are located at 40 CFR part 58.

analysis finds that the estimated monetized benefits of attaining the 1997 standards in 2015 are between $43 billion and $97 billion annually, and the estimated monetized costs are $6.7 billion annually. The RIA states: ''Note that because this analysis was intended to compare costs and benefits of attaining alternative standards by fixed dates, it did not attempt to identify for each designated $PM_{2.5}$ area measures that may be needed to meet subpart 1 Clean Air Act requirements, such as reasonably available measures and attainment as expeditiously as practicable. It is expected that additional costs and benefits will begin to accrue in earlier years as states comply with these requirements.'' (RIA, p. 1–4)

B. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the *Paperwork Reduction Act,* 44 U.S.C. 3501 *et seq.* In a separate **Federal Register** notice published today, EPA is requesting comment on the information collection requirements of this rule. The information collection requirements are not enforceable until OMB approves them.

The data collected from the State or local air agency respondents will include the required SIP elements prescribed in CAA sections 110 and part D, subpart 1 of title I for Implementation plans and the requirements in this Implementation Rule (40 CFR 51.1000–51.1012). The $PM_{2.5}$ SIP will contain rules and other requirements designed to achieve the NAAQS by the deadlines established under the CAA, and it also contains a demonstration that the State's requirements will in fact result in attainment. The SIP must meet the requirements in subpart 1 to adopt RACM, RACT, and provide for RFP toward attainment for the period prior to the area's attainment date.

The Agency anticipates additional administrative burden during the 3 year period of the ICR for State governments and the Agency of 630,000 hours and 69,300 hours, respectively. Fifty percent of the hours are expended in the first year with the remainder evenly divided between the second and third years of the ICR period. Tribes are not required to conduct attainment demonstrations or submit the RFP, RACT, or RACM requirements.

The present value of the total additional costs for State government respondents is estimated at $33.4 million for the 3 year period. On an equivalent annual basis that is $12.7 million per year during the 3 year period of the ICR. The present value of the Agency administrative cost burden is estimated at $3.7 million dollars for the 3 year period. This is equivalent to an equal annual stream of costs of $1.4 million per year during the three year period. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this final action on small entities, small entity is defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; or (3) a small organization that is any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities and it is not necessary to prepare a regulatory flexibility analysis in conjunction with this final rule. The final rule governing SIPs will not directly impose any requirements on small entities. Rather, this rule interprets the obligations established in the CAA for States to submit implementation plans in order to attain the $PM_{2.5}$ NAAQS.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and Tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''Federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, EPA is required by section 205 of the UMRA to identify and consider a reasonable number of regulatory alternatives, and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This rule contains no Federal mandate that may result in expenditures

of $100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any 1 year. The estimated administrative burden hours and costs associated with implementing the $PM_{2.5}$ NAAQS are estimated in the ICR for this rule. The estimated costs presented there for States totals $33.4 million for a three-year period. Thus, this rule is not subject to the requirements of section 202 and 205 of the UMRA. The EPA consulted with governmental entities affected by this rule and has determined that this rule contains no regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments.

The CAA imposes the obligation for States to submit SIPs to implement the $PM_{2.5}$ NAAQS. In this rule, EPA is merely providing an interpretation of those requirements. However, even if this rule did establish an independent requirement for States to submit SIPs, it is questionable whether a requirement to submit a SIP revision would constitute a Federal mandate in any case. The obligation for a State to submit a SIP that arises out of section 110 and section 172 (part D) of the CAA is not legally enforceable by a court of law, and at most is a condition for continued receipt of highway funds. Therefore, it is possible to view an action requiring such a submittal as not creating any enforceable duty within the meaning of section 421(5)(9a)(I) of UMRA (2 U.S.C. 658(a)(I)). Even if it did, the duty could be viewed as falling within the exception for a condition of Federal assistance under section 421(5)(a)(i)(I) of UMRA (2 U.S.C. 658(5)(a)(i)(I)).

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications.'' ''Policies that have Federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

At the time of proposal, EPA concluded that the proposed rule would not have any federalism implications. The EPA stated that the proposed rule would not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The CAA establishes the scheme whereby States take the lead in developing plans to meet the NAAQS. This rule clarifies the statutory obligations of States in implementing the $PM_{2.5}$ NAAQS. However, EPA recognized that States would have a substantial interest in this rule and any corresponding revisions to associated SIP requirements.

Therefore, in the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA held a number of calls with representatives of State and local air pollution control agencies and hosted a public hearing in Washington, DC in November 2005. The EPA considered the comments from State and local governments in developing the final rule.

EPA concludes that this final rule does not have federalism implications, for the reasons proposed. The final rule will not modify the relationship of the States and EPA for purposes of developing programs to implement the NAAQS. As noted above in section D on UMRA, this rule does not impose significant costs on State and local governments. (EPA estimates the costs to States to implement the $PM_{2.5}$ NAAQS to be $33.4 million.) Thus, Executive Order 13132 does not apply to this rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications.'' This final rule does not have ''Tribal implications'' as defined in Executive Order 13175. This rule concerns the requirements for State and tribal implementation plans for attaining the $PM_{2.5}$ air quality standards. The CAA provides for States to develop plans to regulate emissions of air pollutants within their jurisdictions. The Tribal Air Rule (TAR) under the CAA gives Tribes the opportunity to develop and implement CAA programs such as programs to attain and maintain the $PM_{2.5}$ NAAQS, but it leaves to the discretion of the Tribe the decision of whether to develop these programs and which programs, or appropriate elements of a program, they will adopt.

Although Executive Order 13175 does not apply to this rule, EPA did reach out to Tribal leaders and environmental staff in developing this rule. From 2001–2004, the EPA supported a National Designations Workgroup to provide a forum for tribal professionals to give input to the designations process. In 2006, EPA supported a national ''Tribal Air call'' which provides an open forum for all Tribes to voice concerns to EPA about the NAAQS implementation process, including the $PM_{2.5}$ NAAQS. In these meetings, EPA briefed call participants and Tribal environmental professionals gave input as the rule was under development. Furthermore, in December 2005, EPA sent individualized letters to all federally recognized Tribes about the proposal to give Tribal leaders the opportunity for consultation.

This final rule does not have Tribal implications as defined by Executive Order 13175. It does not have a substantial direct effect on one or more Indian Tribes, since no Tribe has implemented a CAA program to attain the $PM_{2.5}$ NAAQS at this time. The EPA notes that even if a Tribe were implementing such a plan at this time, while the rule might have Tribal implications with respect to that Tribe, it would not impose substantial direct costs upon it, nor would it preempt Tribal law.

Furthermore, this rule does not affect the relationship or distribution of power and responsibilities between the Federal government and Indian Tribes. The CAA and the TAR establish the relationship of the Federal government and Tribes in developing plans to attain the NAAQS, and this rule does nothing to modify that relationship. As this rule does not have Tribal implications, Executive Order 13175 does not apply.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

EO 13045, ''Protection of Children from Environmental Health and Safety Risks,'' (62 FR 19885, April 23, 1997) applies to any rule that (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency. This final

rule is subject to EO 13045 because it is economically significant as defined in EO 12866, and we believe that the environmental health risk addressed by this action may have a disproportionate effect on children. This rule implements a previously promulgated health-based Federal standard—the $PM_{2.5}$ NAAQS [56]. The NAAQS constitute uniform, national standards for PM pollution; these standards are designed to protect public health with an adequate margin of safety, as required by CAA section 109. However, the protection offered by these standards may be especially important for children because children, along with other sensitive population subgroups such as the elderly and people with existing heart or lung disease, are potentially susceptible to health effects resulting from PM exposure. Because children are considered a potentially susceptible population, we have carefully evaluated the environmental health effects of exposure to PM pollution among children. These effects and the size of the population affected are summarized in section 9.2.4 of the Criteria Document and section 3.5 of the Staff Paper.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This final rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions That Significantly Affect Energy Supply, Distribution, or Use,'' (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This rule is not a ''significant energy action,'' because it does not establish requirements that directly affect the general public and the public and private sectors, but, rather, interprets the statutory requirements that apply to States in preparing their SIPs. The SIPs themselves will likely establish requirements that directly affect the general public, and the public and private sectors.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer Advancement Act of 1995 (''NTTAA''), Public Law No. 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by VCS bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable VCS.

This final rulemaking does not involve technical standards. Therefore, EPA is not considering the use of any VCS. The EPA will encourage the States and Tribes to consider the use of such standards, where appropriate, in the development of their implementation plans.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898 (59 FR 7629 (Feb. 16, 1994) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority populations and low-income populations in the United States.

The EPA has determined that the final rule should not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The health and environmental risks associated with fine particles were considered in the establishment of the $PM_{2.5}$ NAAQS. The level is designed to be protective with an adequate margin of safety. This final rule provides a framework for improving environmental quality and reducing health risks for areas that may be designated nonattainment.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing the rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A Major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective June 25, 2007.

L. Petitions for Judicial Review

Under section 307(b)(1) of the Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit by June 25, 2007. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. See Act section 307(b)(2).

M. Judicial Review

Under sections 307(d)(1)(E) and 307(d)(1)(V) of the CAA, the Administrator determines that this action is subject to the provisions of section 307(d). Section 307(d)(1)(V) provides that the provisions of section 307(d) apply to ''such other actions as the Administrator may determine.'' While the Administrator did not make this determination earlier, the Administrator believes that all of the procedural requirements, e.g., docketing, hearing and comment periods, of section 307(d) have been complied with during the course of this rulemaking.

IV. Statutory Authority

The statutory authority for this action is provided by 42 U.S.C. 7401, 7408, 7410, 7501–7509a, and 7601(a)(1). This notice is also subject to 307(d) of the CAA (42 U.S.C. 7407(d)).

List of Subjects in 40 CFR Part 51

Administrative practice and procedure, Air pollution control, Intergovernmental relations, Nitrogen dioxide, Ozone, Particulate matter, Sulfur oxides, Transportation, Volatile organic compound.

Dated: March 29, 2007.

Stephen L. Johnson,

Administrator.

■ For the reasons set out in the preamble, title 40, chapter I of the Code

[56] *See* 62 FR 38652–38760, National Ambient Air Quality Standards for Particulate Matter, Final Rule; also 40 CFR part 50.

of Federal Regulations is amended as follows:

■ 1. The authority citation for part 51 continues to read as follows:

Authority: 23 U.S.C. 101; 42 U.S.C. 7401–7671q.

■ 2. A new Subpart Z is added to read as follows:

Subpart Z—Provisions for Implementation of $PM_{2.5}$ National Ambient Air Quality Standards

Sec.

§ 51.1000 Definitions.

The following definitions apply for purposes of this subpart. Any term not defined herein shall have the meaning as defined in 40 CFR 51.100.

Act means the Clean Air Act as codified at 42 U.S.C. 7401–7671q. (2003).

Attainment date means the date by which an area, under an approved State implementation plan, is required to attain the $PM_{2.5}$ NAAQS (based on the average of three consecutive years of ambient air quality data).

Baseline year inventory for the RFP plan is the emissions inventory for the year also used as the base year for the attainment demonstration.

Benchmark RFP plan means the reasonable further progress plan that requires generally linear emission reductions in pollutants from the baseline emissions year through the milestone inventory year.

Date of designation means the effective date of the $PM_{2.5}$ area designation as promulgated by the Administrator.

Direct $PM_{2.5}$ emissions means solid particles emitted directly from an air emissions source or activity, or gaseous emissions or liquid droplets from an air emissions source or activity which condense to form particulate matter at ambient temperatures. Direct $PM_{2.5}$ emissions include elemental carbon, directly emitted organic carbon, directly emitted sulfate, directly emitted nitrate, and other inorganic particles (including but not limited to crustal material, metals, and sea salt).

Existing control measure means any Federally enforceable national, State, or local control measure that has been approved in the SIP and that results in reductions in emissions of $PM_{2.5}$ or $PM_{2.5}$ precursors in a nonattainment area.

Full implementation inventory is the projected RFP emission inventory for the year preceding the attainment date, representing a level of emissions that demonstrates attainment.

Milestone year inventory is the projected RFP emission inventory for the applicable RFP milestone year (*i.e.* 2009 and, where applicable, 2012).

$PM_{2.5}$ NAAQS means the particulate matter national ambient air quality standards (annual and 24-hour) codified at 40 CFR 50.7.

$PM_{2.5}$ design value for a nonattainment area is the highest of the three-year average concentrations calculated for the monitors in the area, in accordance with 40 CFR part 50, appendix N.

$PM_{2.5}$ attainment plan precursor means $S0_2$ and those other $PM_{2.5}$ precursors emitted by sources in the State which the State must evaluate for emission reduction measures to be included in its $PM_{2.5}$ nonattainment area or maintenance area plan.

$PM_{2.5}$ precursor means those air pollutants other than $PM_{2.5}$ direct emissions that contribute to the formation of $PM_{2.5}$. $PM_{2.5}$ precursors include $S0_2$, NO_X, volatile organic compounds, and ammonia.

Reasonable further progress (RFP) means the incremental emissions reductions toward attainment required under sections 172(c)(2) and 171(1).

Subpart 1 means the general attainment plan requirements found in subpart 1 of part D of title I of the Act.

§ 51.1001 Applicability of part 51.

The provisions in subparts A through X of this part apply to areas for purposes of the $PM_{2.5}$ NAAQS to the extent they are not inconsistent with the provisions of this subpart.

§ 51.1002 Submittal of State implementation plan.

(a) For any area designated by EPA as nonattainment for the $PM_{2.5}$ NAAQS, the State must submit a State implementation plan satisfying the requirements of section 172 of the Act and this subpart to EPA by the date prescribed by EPA which will be no later than 3 years from the date of designation.

(b) The State must submit a plan consistent with the requirements of section 110(a)(2) of the Act unless the State already has fulfilled this obligation for the purposes of implementing the $PM_{2.5}$ NAAQS.

(c) *Pollutants contributing to fine particle concentrations.* The State implementation plan must identify and evaluate sources of $PM_{2.5}$ direct emissions and $PM_{2.5}$ attainment plan precursors in accordance with §§ 51.1009 and 51.1010. After January 1, 2011, for purposes of establishing emissions limits under 51.1009 and 51.1010, States must establish such limits taking into consideration the condensable fraction of direct $PM_{2.5}$ emissions. Prior to this date, States are not prohibited from establishing source emission limits that include the condensable fraction of direct $PM_{2.5}$.

(1) The State must address sulfur dioxide as a $PM_{2.5}$ attainment plan precursor and evaluate sources of SO_2 emissions in the State for control measures.

(2) The State must address NO_X as a $PM_{2.5}$ attainment plan precursor and evaluate sources of NO_X emissions in the State for control measures, unless the State and EPA provide an appropriate technical demonstration for a specific area showing that NO_X emissions from sources in the State do not significantly contribute to $PM_{2.5}$ concentrations in the nonattainment area.

(3) The State is not required to address VOC as a $PM_{2.5}$ attainment plan precursor and evaluate sources of VOC emissions in the State for control measures, unless:

(i) the State provides an appropriate technical demonstration for a specific area showing that VOC emissions from sources in the State significantly contribute to $PM_{2.5}$ concentrations in the nonattainment area, and such demonstration is approved by EPA; or

(ii) The EPA provides such a technical demonstration.

(4) The State is not required to address ammonia as a $PM_{2.5}$ attainment plan precursor and evaluate sources of ammonia emissions from sources in the State for control measures, unless:

(i) The State provides an appropriate technical demonstration for a specific area showing that ammonia emissions from sources in the State significantly contribute to $PM_{2.5}$ concentrations in the

nonattainment area, and such demonstration is approved by EPA; or

(ii) The EPA provides such a technical demonstration.

(5) The State must submit a demonstration to reverse any presumption in this rule for a $PM_{2.5}$ precursor with respect to a particular nonattainment area, if the administrative record related to development of its SIP shows that the presumption is not technically justified for that area.

§ 51.1003 [Reserved]

§ 51.1004 Attainment dates.

(a) Consistent with section 172(a)(2)(A) of the Act, the attainment date for an area designated nonattainment for the $PM_{2.5}$ NAAQS will be the date by which attainment can be achieved as expeditiously as practicable, but no more than five years from the date of designation. The Administrator may extend the attainment date to the extent the Administrator determines appropriate, for a period no greater than 10 years from the date of designation, considering the severity of nonattainment and the availability and feasibility of pollution control measures.

(b) In the SIP submittal for each of its nonattainment areas, the State must submit an attainment demonstration justifying its proposed attainment date. For each nonattainment area, the Administrator will approve an attainment date at the same time the Administrator approves the attainment demonstration for the area, consistent with the attainment date timing provision of section 172(a)(2)(A) and paragraph (a) of this section.

(c) Upon a determination by EPA that an area designated nonattainment for the $PM_{2.5}$ NAAQS has attained the standard, the requirements for such area to submit attainment demonstrations and associated reasonably available control measures, reasonable further progress plans, contingency measures, and other planning SIPs related to attainment of the $PM_{2.5}$ NAAQS shall be suspended until such time as: the area is redesignated to attainment, at which time the requirements no longer apply; or EPA determines that the area has violated the $PM_{2.5}$ NAAQS, at which time the area is again required to submit such plans.

§ 51.1005 One-year extensions of the attainment date.

(a) Pursuant to section 172(a)(2)(C)(ii) of the Act, a State with an area that fails to attain the $PM_{2.5}$ NAAQS by its attainment date may apply for an initial 1-year attainment date extension if the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and:

(1) For an area that violates the annual $PM_{2.5}$ NAAQS as of its attainment date, the annual average concentration for the most recent year at each monitor is 15.0 $\mu g/m^3$ or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(2) For an area that violates the 24-hour $PM_{2.5}$ NAAQS as of its attainment date, the 98th percentile concentration for the most recent year at each monitor is 65 $\mu g/m^3$ or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(b) An area that fails to attain the $PM_{2.5}$ NAAQS after receiving a 1-year attainment date extension may apply for a second 1-year attainment date extension pursuant to section 172(a)(2)(C)(ii) if the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and:

(1) For an area that violates the annual $PM_{2.5}$ NAAQS as of its attainment date, the two-year average of annual average concentrations at each monitor, based on the first extension year and the previous year, is 15.0 $\mu g/m^3$ or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(2) For an area that violates the 24-hour $PM_{2.5}$ NAAQS as of its attainment date, the two-year average of annual 98th percentile concentrations at each monitor, based on the first extension year and the previous year, is 65 $\mu g/m^3$ or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

§ 51.1006 Redesignation to nonattainment following initial designations for the $PM_{2.5}$ NAAQS.

Any area that is initially designated ''attainment/unclassifiable'' for the $PM_{2.5}$ NAAQS may be subsequently redesignated to nonattainment if ambient air quality data in future years indicate that such a redesignation is appropriate. For any such area that is redesignated to nonattainment for the $PM_{2.5}$ NAAQS, any absolute, fixed date that is applicable in connection with the requirements of this part is extended by a period of time equal to the length of time between the effective date of the initial designation for the $PM_{2.5}$ NAAQS and the effective date of redesignation, except as otherwise provided in this subpart.

§ 51.1007 Attainment demonstration and modeling requirements.

(a) For any area designated as nonattainment for the $PM_{2.5}$ NAAQS, the State must submit an attainment demonstration showing that the area will attain the annual and 24-hour standards as expeditiously as practicable. The demonstration must meet the requirements of § 51.112 and Appendix W of this part and must include inventory data, modeling results, and emission reduction analyses on which the State has based its projected attainment date. The attainment date justified by the demonstration must be consistent with the requirements of § 51.1004(a). The modeled strategies must be consistent with requirements in § 51.1009 for RFP and in § 51.1010 for RACT and RACM. The attainment demonstration and supporting air quality modeling should be consistent with EPA's $PM_{2.5}$ modeling guidance.

(b) *Required time frame for obtaining emissions reductions.* For each nonattainment area, the State implementation plan must provide for implementation of all control measures needed for attainment as expeditiously as practicable, but no later than the beginning of the year prior to the attainment date. Consistent with section 172(c)(1) of the Act, the plan must provide for implementation of all RACM and RACT as expeditiously as practicable. The plan also must include RFP milestones in accordance with § 51.1009, and control measures needed to meet these milestones, as necessary.

§ 51.1008 Emission inventory requirements for the $PM_{2.5}$ NAAQS.

(a) For purposes of meeting the emission inventory requirements of section 172(c)(3) of the Act for nonattainment areas, the State shall, no later than three years after designation:

(1) Submit to EPA Statewide emission inventories for direct $PM_{2.5}$ emissions and emissions of $PM_{2.5}$ precursors. For purposes of defining the data elements for these inventories, the $PM_{2.5}$ and $PM_{2.5}$ precursor-relevant data element requirements under subpart A of this part shall apply.

(2) Submit any additional emission inventory information needed to support an attainment demonstration and RFP plan ensuring expeditious attainment of the annual and 24-hour $PM_{2.5}$ standards.

(b) For inventories required for submission under paragraph (a) of this section, a baseline emission inventory is required for the attainment demonstration required under § 51.1007 and for meeting RFP requirements

under § 51.1009. As determined on the date of designation, the base year for this inventory shall be the most recent calendar year for which a complete inventory was required to be submitted to EPA pursuant to subpart A of this part. The baseline emission inventory for calendar year 2002 or other suitable year shall be used for attainment planning and RFP plans for areas initially designated nonattainment for the $PM_{2.5}$ NAAQS in 2004–2005.

§ 51.1009 Reasonable further progress (RFP) requirements.

(a) Consistent with section 172(c)(2) of the Act, State implementation plans for areas designated nonattainment for the $PM_{2.5}$ NAAQS must demonstrate reasonable further progress as provided in § 51.1009(b) through (h).

(b) If the State submits to EPA an attainment demonstration and State implementation plan for an area which demonstrates that it will attain the PM NAAQS within five years of the date of designation, the State is not required to submit a separate RFP plan. Compliance with the emission reduction measures in the attainment demonstration and State implementation plan will meet the requirements for achieving reasonable further progress for the area.

(c) For any area for which the State submits to EPA an approvable attainment demonstration and State implementation plan that demonstrates the area needs an attainment date of more than five years from the date of designation, the State also must submit an RFP plan. The RFP plan must describe the control measures that provide for meeting the reasonable further progress milestones for the area, the timing of implementation of those measures, and the expected reductions in emissions of direct $PM_{2.5}$ and $PM_{2.5}$ attainment plan precursors. The RFP plan is due to EPA within three years of the date of designation.

(1) For any State that submits to EPA an approvable attainment demonstration and State implementation plan justifying an attainment date of more than five and less than nine years from the date of designation, the RFP plan must include 2009 emissions milestones for direct $PM_{2.5}$ and $PM_{2.5}$ attainment plan precursors demonstrating that reasonable further progress will be achieved for the 2009 emissions year.

(2) For any area that submits to EPA an approvable attainment demonstration and State implementation plan justifying an attainment date of nine or ten years from the date of designation, the RFP plan must include 2009 and 2012 emissions milestones for direct $PM_{2.5}$ and $PM_{2.5}$ attainment plan precursors demonstrating that reasonable further progress will be achieved for the 2009 and 2012 emissions years.

(d) The RFP plan must demonstrate that in each applicable milestone year, emissions will be at a level consistent with generally linear progress in reducing emissions between the base year and the attainment year.

(e) For a multi-State nonattainment area, the RFP plans for each State represented in the nonattainment area must demonstrate RFP on the basis of common multi-State inventories. The States within which the area is located must provide a coordinated RFP plan. Each State in a multi-State nonattainment area must ensure that the sources within its boundaries comply with enforceable emission levels and other requirements that in combination with the reductions planned in other state(s) will provide for attainment as expeditiously as practicable and demonstrate reasonable further progress.

(f) In the benchmark RFP plan, the State must identify direct $PM_{2.5}$ emissions and $PM_{2.5}$ attainment plan precursors regulated under the $PM_{2.5}$ attainment plan and specify target emission reduction levels to be achieved during the milestone years. In developing the benchmark RFP plan, the State must develop emission inventory information for the geographic area included in the plan and conduct the following calculations:

(1) For direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor addressed in the attainment strategy, the full implementation reduction is calculated by subtracting the full implementation inventory from the baseline year inventory.

(2) The ''milestone date fraction'' is the ratio of the number of years from the baseline year to the milestone inventory year divided by the number of years from the baseline year to the full implementation year.

(3) For direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor addressed in the attainment strategy, a benchmark emission reduction is calculated by multiplying the full implementation reduction by the milestone date fraction.

(4) The benchmark emission level in the milestone year is calculated for direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor by subtracting the benchmark emission reduction from the baseline year emission level. The benchmark RFP plan is defined as a plan that achieves benchmark emission levels for direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor addressed in the attainment strategy for the area.

(5) In comparing inventories between baseline and future years for direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor, the inventories must be derived from the same geographic area. The plan must include emissions estimates for all types of emitting sources and activities in the geographic area from which the emission inventories for direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor addressed in the plan are derived.

(6) For purposes of establishing motor vehicle emissions budgets for transportation conformity purposes (as required in 40 CFR part 93) for a $PM_{2.5}$ nonattainment area, the State shall include in its RFP submittal an inventory of on-road mobile source emissions in the nonattainment area.

(g) The RFP plan due three years after designation must demonstrate that emissions for the milestone year are either:

(1) At levels that are roughly equivalent to the benchmark emission levels for direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor to be addressed in the plan; or

(2) At levels included in an alternative scenario that is projected to result in a generally equivalent improvement in air quality by the milestone year as would be achieved under the benchmark RFP plan.

(h) The equivalence of an alternative scenario to the corresponding benchmark plan must be determined by comparing the expected air quality changes of the two scenarios at the design value monitor location. This comparison must use the information developed for the attainment plan to assess the relationship between emissions reductions of the direct $PM_{2.5}$ emissions and each $PM_{2.5}$ attainment plan precursor addressed in the attainment strategy and the ambient air quality improvement for the associated ambient species.

§ 51.1010 Requirements for reasonably available control technology (RACT) and reasonably available control measures (RACM).

(a) For each $PM_{2.5}$ nonattainment area, the State shall submit with the attainment demonstration a SIP revision demonstrating that it has adopted all reasonably available control measures (including RACT for stationary sources) necessary to demonstrate attainment as expeditiously as practicable and to meet any RFP requirements. The SIP revision shall contain the list of the potential measures considered by the State, and

information and analysis sufficient to support the State's judgment that it has adopted all RACM, including RACT.

(b) In determining whether a particular emission reduction measure or set of measures must be adopted as RACM under section 172(c)(1) of the Act, the State must consider the cumulative impact of implementing the available measures. Potential measures that are reasonably available considering technical and economic feasibility must be adopted as RACM if, considered collectively, they would advance the attainment date by one year or more.

§ 51.1011 Requirements for mid-course review.

(a) Any State that submits to EPA an approvable attainment plan for a $PM_{2.5}$ nonattainment area justifying an attainment date of nine or ten years from the date of designation also must submit to EPA a mid-course review six years from the date of designation.

(b) The mid-course review for an area must include:

(1) A review of emissions reductions and progress made in implementing control measures to reduce emissions of direct $PM_{2.5}$ and $PM_{2.5}$ attainment plan precursors contributing to $PM_{2.5}$ concentrations in the area;

(2) An analysis of changes in ambient air quality data for the area;

(3) Revised air quality modeling analysis to demonstrate attainment;

(4) Any new or revised control measures adopted by the State, as necessary to ensure attainment by the attainment date in the approved SIP of the nonattainment area.

§ 51.1012 Requirement for contingency measures.

Consistent with section 172(c)(9) of the Act, the State must submit in each attainment plan specific contingency measures to be undertaken if the area fails to make reasonable further progress, or fails to attain the $PM_{2.5}$ NAAQS by its attainment date. The contingency measures must take effect without significant further action by the State or EPA.

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