



Managing Air Quality: State Implementation Plans

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Quiz

□ What is a SIP?

A: A collection of programs, policies and rules adopted by States and approved by EPA to attain and maintain the NAAQS

B: State-issued, EPA-approved orders requiring pollution control at individual companies

C: Other actions listed in the Code of Federal Regulations Title 40, Chapter I, Part 52

D: Enough paperwork to fill an 8x8 room from floor to ceiling

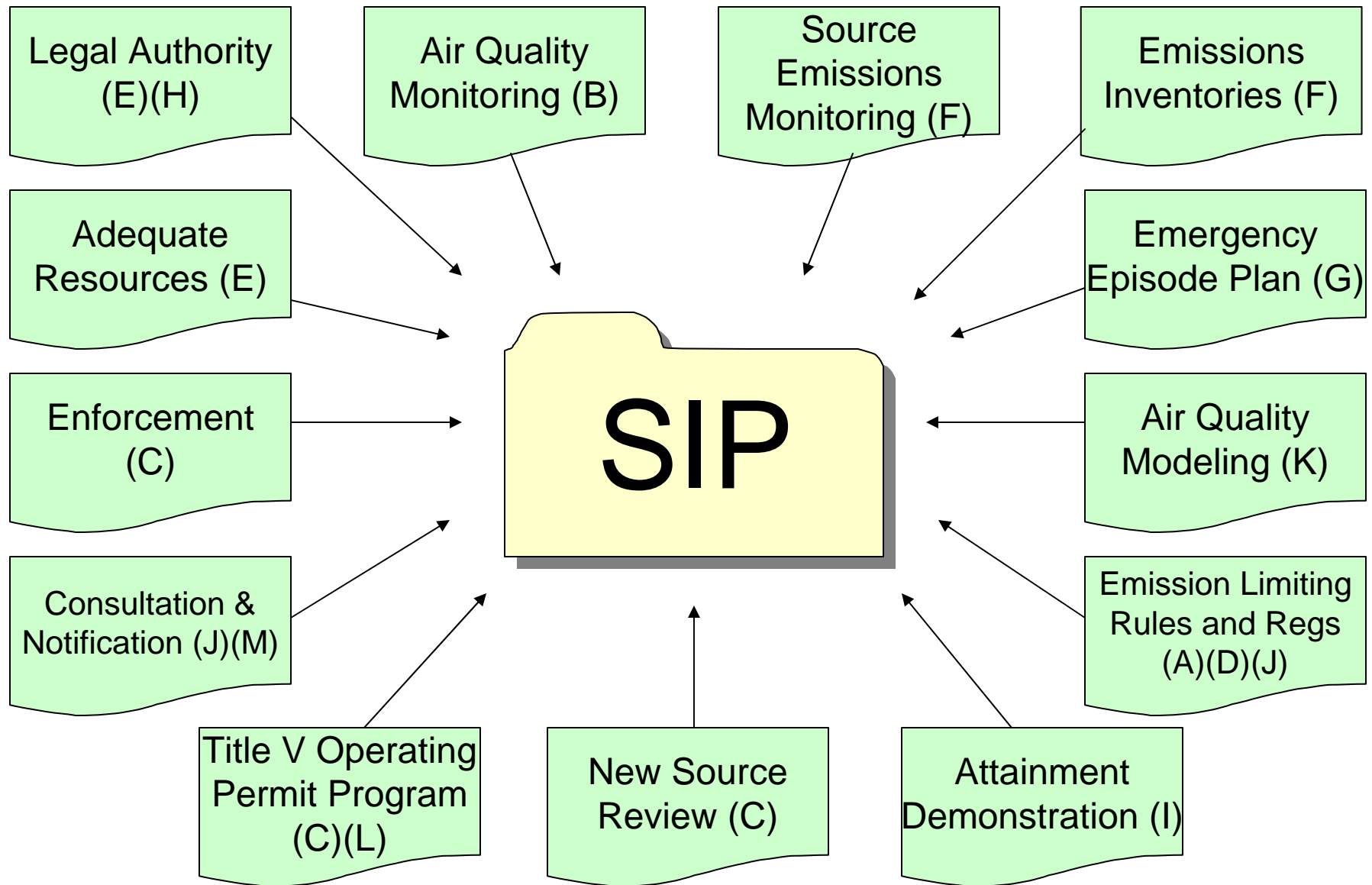
E: All of the above

The State Implementation Plan (SIP): the backbone of attainment

- SIPs are the framework that provides control measures to “clean the air” so the area reaches attainment with the NAAQS by attainment deadlines
- CAA requires a general plan to achieve the NAAQS in all areas of the country and a specific plan for each nonattainment area
- SIPs are developed by States (and locals), and after notice and public hearing, submitted to EPA for approval through Federal rulemaking
- After EPA approval, SIPs and associated control measures are enforceable at both the state and national levels



SIP Components: CAA '110(a)(2)



'110 SIP Components (A)-(G)

- ❑ **Emission controls:** Section 110(a)(2)(A) requires necessary emission limits and other control measures as are necessary to carry out provisions of the Clean Air Act.
- ❑ **Ambient air quality monitoring/data system:** Section 110(a)(2)(B) requires SIPs to provide for setting up and operating ambient air quality monitors, collecting and analyzing data and making these data available to EPA upon request.
- ❑ **Program for enforcement of control measures:** Section 110(a)(2)(C) requires SIPs to include a program providing for enforcement of measures and regulation of new/modified (permitted) sources.
- ❑ **Interstate transport:** Section 110(a)(2)(D) requires SIPs to include provisions prohibiting any source or other type of emissions activity in one State from contributing significantly to nonattainment in another State or from interfering with measures required to prevent significant deterioration of air quality or to protect visibility.
- ❑ **Adequate resources:** Section 110(a)(2)(E) requires SIPs to provide assurances that the State will have provide adequate funding, personnel and legal authority for implementation of their SIPs.
- ❑ **Stationary source monitoring system:** Section 110(a)(2)(F) requires SIPs to require, as prescribed by EPA, emissions monitoring for stationary sources, and to submit periodic emissions reports.
- ❑ **Emergency power:** Section 110(a)(2)(G) requires SIPs to provide authority for emergency actions to protect public health and emergency episode plans to implement the authority.

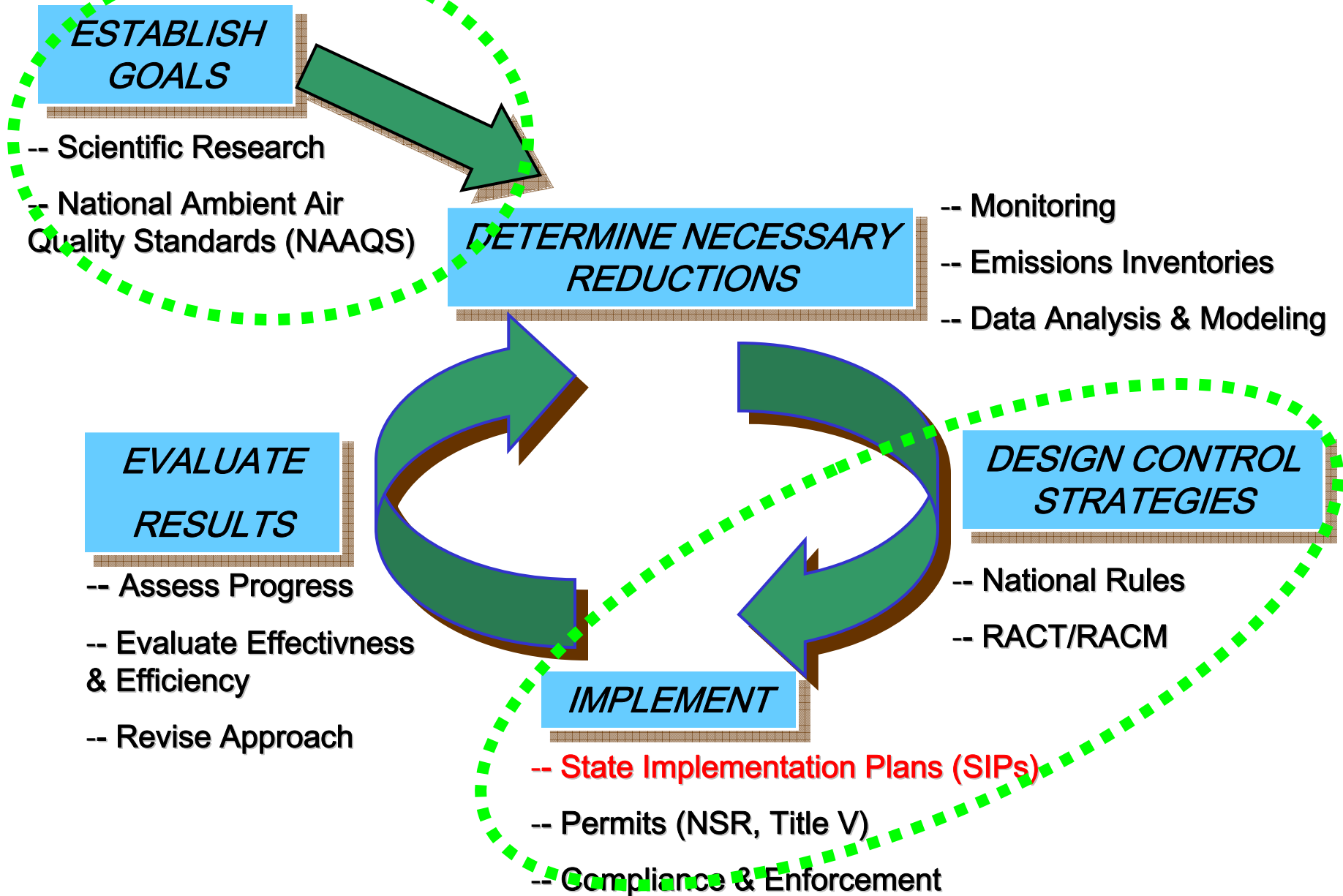
'110 SIP Components (H)-(M)

- ❑ **Provisions for SIP revision due to NAAQS changes or findings of inadequacies:** Section 110(a)(2)(H) requires SIPs to provide for future SIP revisions in response to changes in the NAAQS, availability of improved methods for attaining the NAAQS, or in response to a call that the SIP is inadequate.
- ❑ **Attainment planning:** Section 110(a)(2)(I) requires areas designated as nonattainment to meet the applicable nonattainment planning requirements of part D, title I of the Act.
- ❑ **Section 121 consultation:** Section 110(a)(2)(J) requires that SIPs meet applicable requirements of section 121 relating to consultation.
- ❑ **Section 127 public notification:** Section 110(a)(2)(J) requires that SIPs meet applicable requirements of section 127 relating to public notification.
- ❑ **PSD and visibility protection:** Section 110(a)(2)(J) also requires that SIPs meet applicable requirements of part C related to prevention of significant deterioration and visibility protection.
- ❑ **Air quality modeling/data:** Section 110(a)(2)(K) requires that SIPs provide for performing air quality modeling for predicting effects on air quality of emissions from any NAAQS pollutant and submission of air quality modeling data to EPA upon request.
- ❑ **Permitting fees:** Section 110(a)(2)(L) requires each major stationary source to pay permitting fees to cover the cost of reviewing, approving, implementing and enforcing a required permits.
- ❑ **Consultation/participation by affected local entities:** Section 110(a)(2)(M) requires that SIPs provide for consultation and participation ⁶ by local political subdivisions affected by the SIP.

Compliance and Enforcement

- EPA approved SIPs are enforceable by either the State or EPA
- States establish through their SIPs, schedules of compliance for sources subject to the SIP
 - States have primary enforcement authority
 - EPA may take actions if warranted or needed
- EPA can “call” a SIP if it is insufficient or for failure to implement (*see '110(k)(5)*)
 - Sanctions may apply (*see '110(m) and '179*)

Air Quality Management Cycle



Establishing Goals: Ongoing NAAQS Reviews

MILESTONE	POLLUTANT						
	Ozone	Lead	NO ₂ Primary	SO ₂ Primary	NO ₂ /SO ₂ Secondary	PM	CO
Final Integrated Review Plan	N/A	N/A	August 2007	September 2007	December 2007	December 2007	May 2008
Final Science Assessment	Final Criteria Document March 2006	Final Criteria Document Oct 2006 1 st draft Staff Paper December 2006	July 11, 2008	September 12, 2008	December 12, 2008	September 2009	May 2010
Final Risk/Exposure Assessment	January 31, 2007	October 31, 2007	November 2008	January 2009	July 2009	March 2010	January 2011
ANPR	Final Staff Paper January 31, 2007	Final Staff Paper November 1, 2007 ANPR November 30, 2007	December 2008	February 2009	August 2009	September 2010	February 2011
NPR	June 20, 2007	March 2008	May 28, 2009	July 30, 2009	February 12, 2010	February 2011	October 2011
NFR	March 12, 2008	September 1, 2008	December 18, 2009	March 2, 2010	October 19, 2010	October 2011	July 2012 9

Current NAAQS

Carbon Monoxide (CO)

9 ppm (10 mg/m³)

Primary 8-hour Average

35 ppm (40 mg/m³)

Primary 1-hour Average

Nitrogen Dioxide (NO₂)

0.053 ppm (100 µg/m³)

Primary & Secondary Annual Arithmetic Mean

Ozone (O₃)

0.12 ppm (235 µg/m³)

Primary & Secondary 1-hour Average

0.08 ppm (157 µg/m³)

Primary & Secondary 8-hour Average

Lead (Pb)

1.5 µg/m³

Primary & Secondary Quarterly Average

Particulate (PM 10) *Particles with diameters of 10 micrometers or less*

~~50 µg/m³~~

~~Primary & Secondary Annual Arithmetic Mean~~

150 µg/m³

Primary & Secondary 24-hour Average

Particulate (PM 2.5) *Particles with diameters of 2.5 micrometers or less*

15 µg/m³

Primary & Secondary Annual Arithmetic Mean

~~35~~ µg/m³

Primary & Secondary 24-hour Average

Sulfur Dioxide (SO₂)

0.03 ppm (80 µg/m³)

Primary Annual Arithmetic Mean

0.14 ppm (365 µg/m³)

Primary 24-hour Average

0.50 ppm (1300 µg/m³)

Secondary 3-hour Average

Simplified NAAQS Planning Schedule

- New/Revised NAAQS -0-
- Area Designations +2 yrs
- Section 110 "Infrastructure SIP" +3 yrs*
 - Also Nonattainment New Source Review & Conformity
- Section 110 "Nonattainment SIP" +5 yrs*
- Attainment
 - Subpart 1 ✂7+ yrs
 - Subpart 2 ✂5+ yrs

* EPA SIP review/approval response times see '110(k)(1)&(2)

Implementation Timeline for Current PM and Ozone Standards

Milestone	1997 8-Hr Ozone	1997 PM2.5	2006 PM2.5
Effective Date	<i>September 1997</i>	<i>September 1997</i>	<i>December 2006</i>
Designation Recommendations to EPA	<i>July 2003</i>	<i>February 2004</i>	<i>December 2007</i>
Final Designation (Effective)	<i>April 2004 (June 2005)</i>	<i>December 2004 (April 2005)</i>	<i>December 2008 (early 2009)</i>
"Infrastructure SIP" Due	<i>September 2000</i>	<i>September 2000</i>	<i>Early 2010</i>
"Attainment Demonstration" SIP Due	<i>June 2007</i>	<i>April 2008 (RH Dec 2007)</i>	<i>Early 2012</i>
Attainment Dates	<i>June 2007 up to June 2024</i>	<i>April 2010 up to April 2015</i>	<i>Early 2014 up to Early 2019</i>

Maximum Attainment Dates for 1997 8-Hr Ozone NA Areas

- Subpart 2 Areas:
 - Marginal – June 2007
 - Moderate – June 2010
 - Serious – June 2013
 - Severe 15 – June 2019
 - Severe 17 – June 2021
 - Extreme – June 2024

- Subpart 1 Areas:
 - DC Circuit Court vacated ozone implementation rule provisions for subpart 1 areas
 - Attainment date was June 2009 up to June 2014; will re-propose

Rules Governing Implementation

- Generally found in 40 CFR Part 51
- Clean Air Fine Particle (PM_{2.5}) Implementation Rule (*72 FR 20586, April 24, 2007*)
 - *40 CFR Subpart Z 51.1000*
- Final Rule to Implement the 8-Hr Ozone NAAQS
 - Phase 1 (*see 69 FR 23951, April 30, 2004*)
 - Phase 2 (*see 70 FR 71612, Nov. 29, 2005*)
 - *40 CFR Subpart X 51.900*
- Regional Haze Regulations (*64 FR 35714, July 1, 1999*)
 - *40 CFR Subpart P 51.300*

Current Implementation Litigation

- PM_{2.5} Implementation Rule
 - Several pending petitions for reconsideration
 - Petitions for judicial review
- 8-hr Ozone Phase 1 Rule
 - DC Circuit Court partial vacatur
 - Affects subpart 1 classification (not designation)
 - Affects removal of certain 1-hr Ozone requirements (NSR applicability, section 185 fee programs, and contingency measures)
- 8-hr Ozone Phase 2 Rule
 - Reconsiderations completed
 - Litigation moving forward, schedule pending

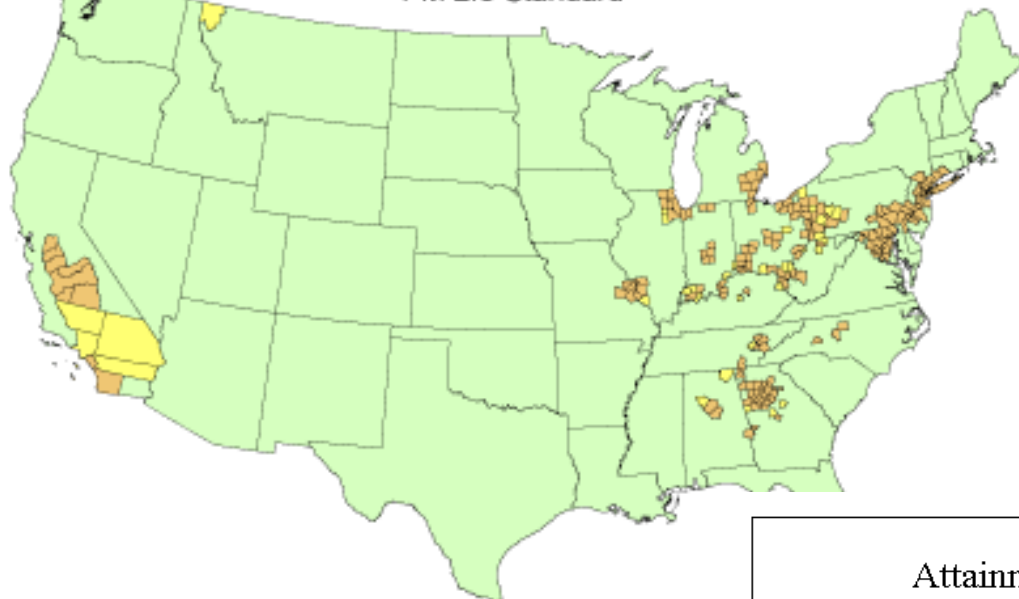
Designations

- EPA, with input from States, must determine which areas of the country fail to meet the NAAQS
- EPA designates areas according to their air quality:
 - Attainment
 - Nonattainment
 - Unclassifiable
- EPA designates an area as “**nonattainment**” if it has air quality that does not meet the NAAQS, or if it contributes to air quality in a nearby area that does not meet the NAAQS

Designations (cont.)

- ❑ Factors in deciding whether to include an area in the designated nonattainment area boundary:
 - ❑ Emission data
 - ❑ Air quality data
 - ❑ Population density and degree of urbanization (including commercial development)
 - ❑ Traffic and commuting patterns
 - ❑ Growth rates and patterns
 - ❑ Meteorology (weather/transport patterns)
 - ❑ Geography/topography (mountain ranges or other air basin boundaries)
 - ❑ Jurisdictional boundaries (e.g., counties, air districts, Reservations, metropolitan planning organizations (MPOs))
 - ❑ Level of control of emission sources
- ❑ State recommendations due no later than 1 year after new/revised standard
- ❑ EPA must issue designations within 2 years after new/revised standard; no less than 120 day notification to States if we modify their recommendations

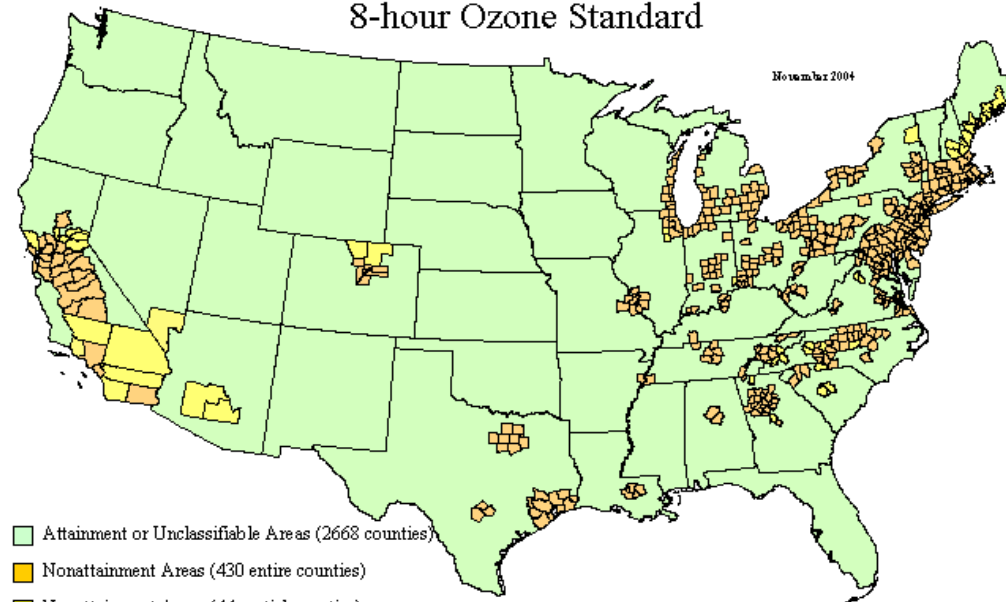
Attainment and Nonattainment Areas in the U.S.
PM 2.5 Standard



- Attainment (or Unclassifiable) Areas (2916 counties)
- Nonattainment Areas (191 entire counties)
- Nonattainment Areas (34 partial counties)

1997 PM_{2.5}
Effective April 2005

Attainment and Nonattainment Areas in the U.S.
8-hour Ozone Standard

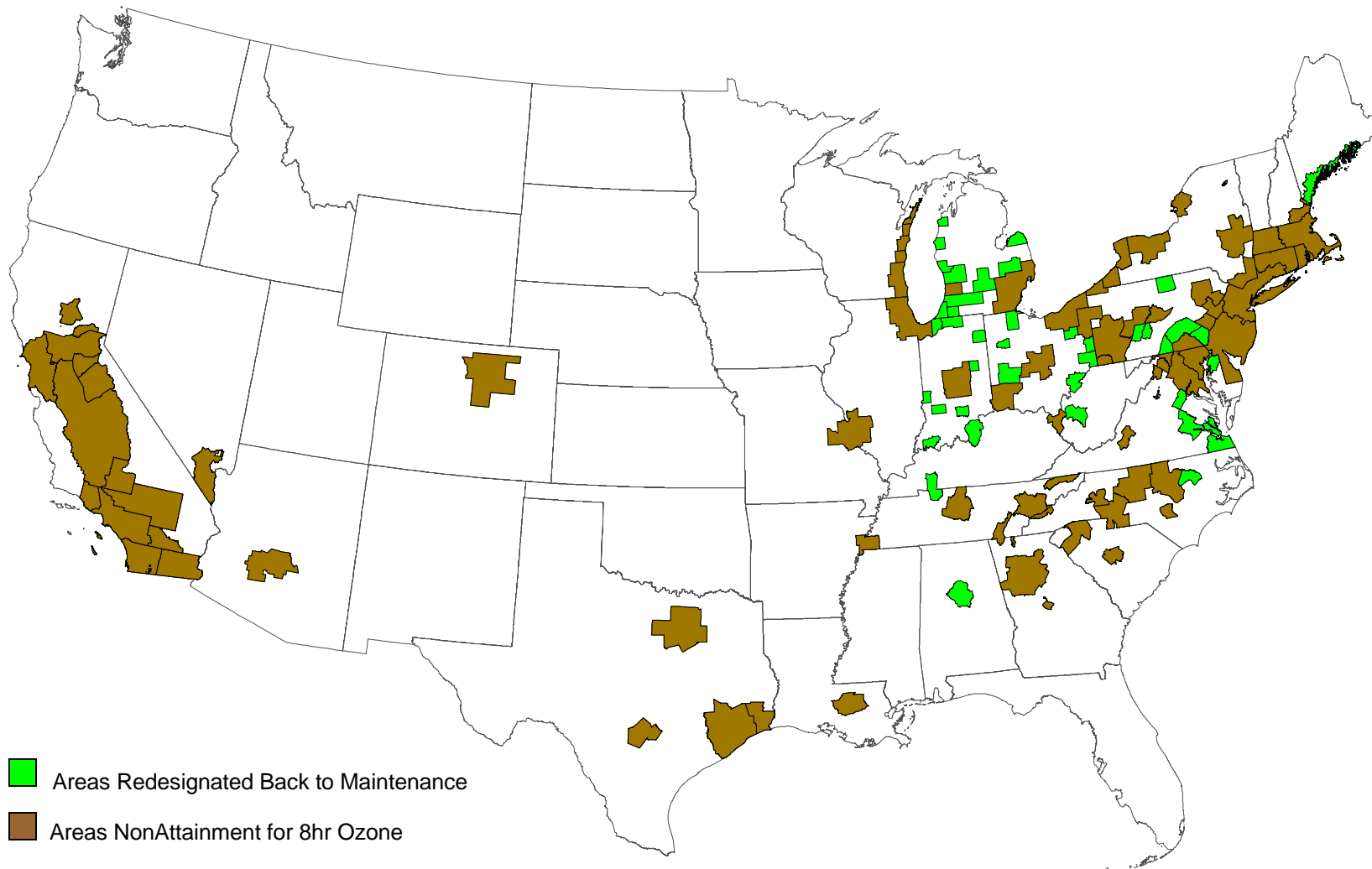


- Attainment or Unclassifiable Areas (2668 counties)
- Nonattainment Areas (430 entire counties)
- Nonattainment Areas (44 partial counties)

1997 8-Hr Ozone
Effective June 2004

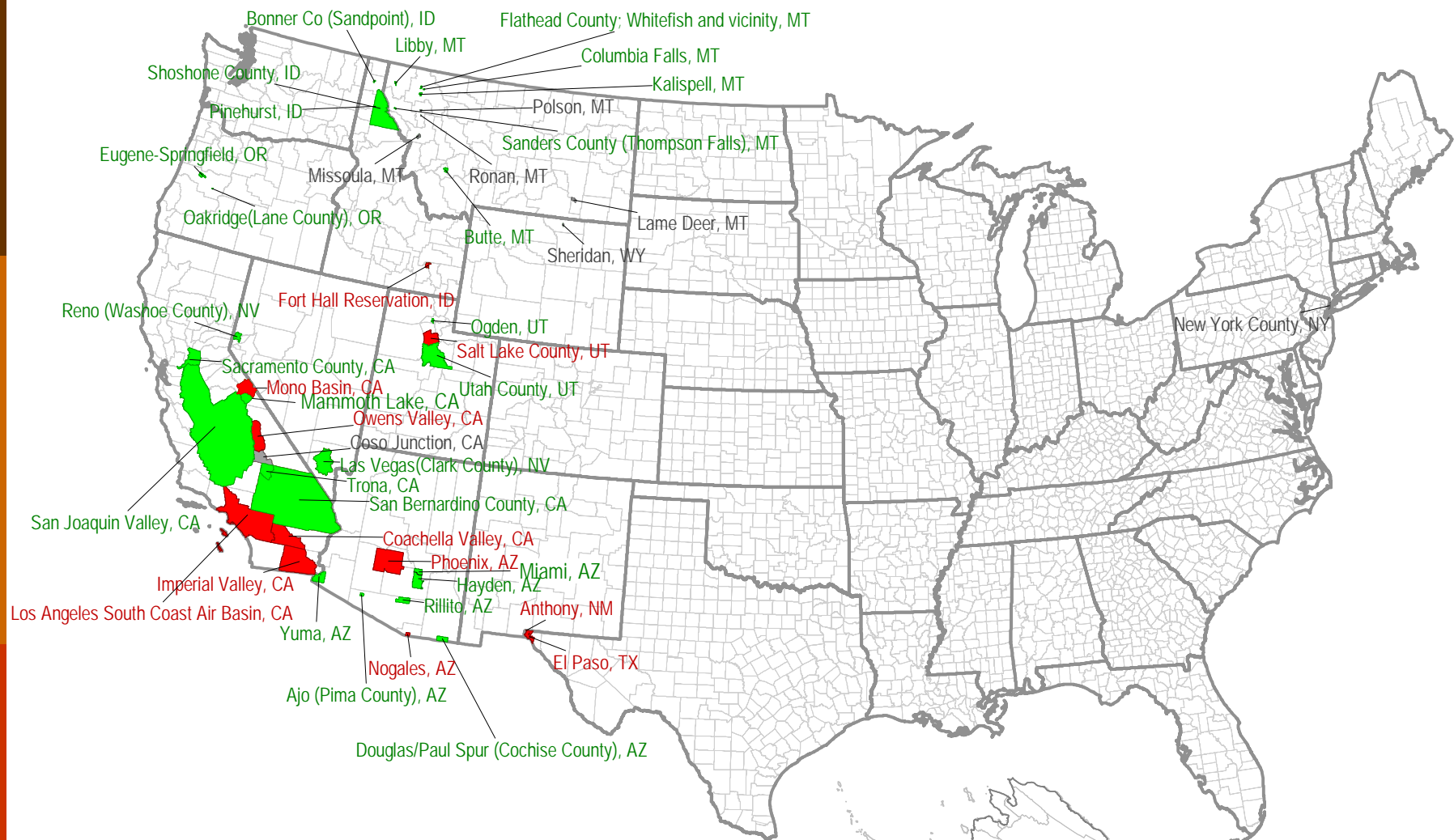
8-Hr Ozone Nonattainment Area Status

Aug. 16, 2007



Status of Current PM₁₀ Nonattainment Areas

Based on 2004 – 2006 Air Quality



Legend

Nonattainment areas:

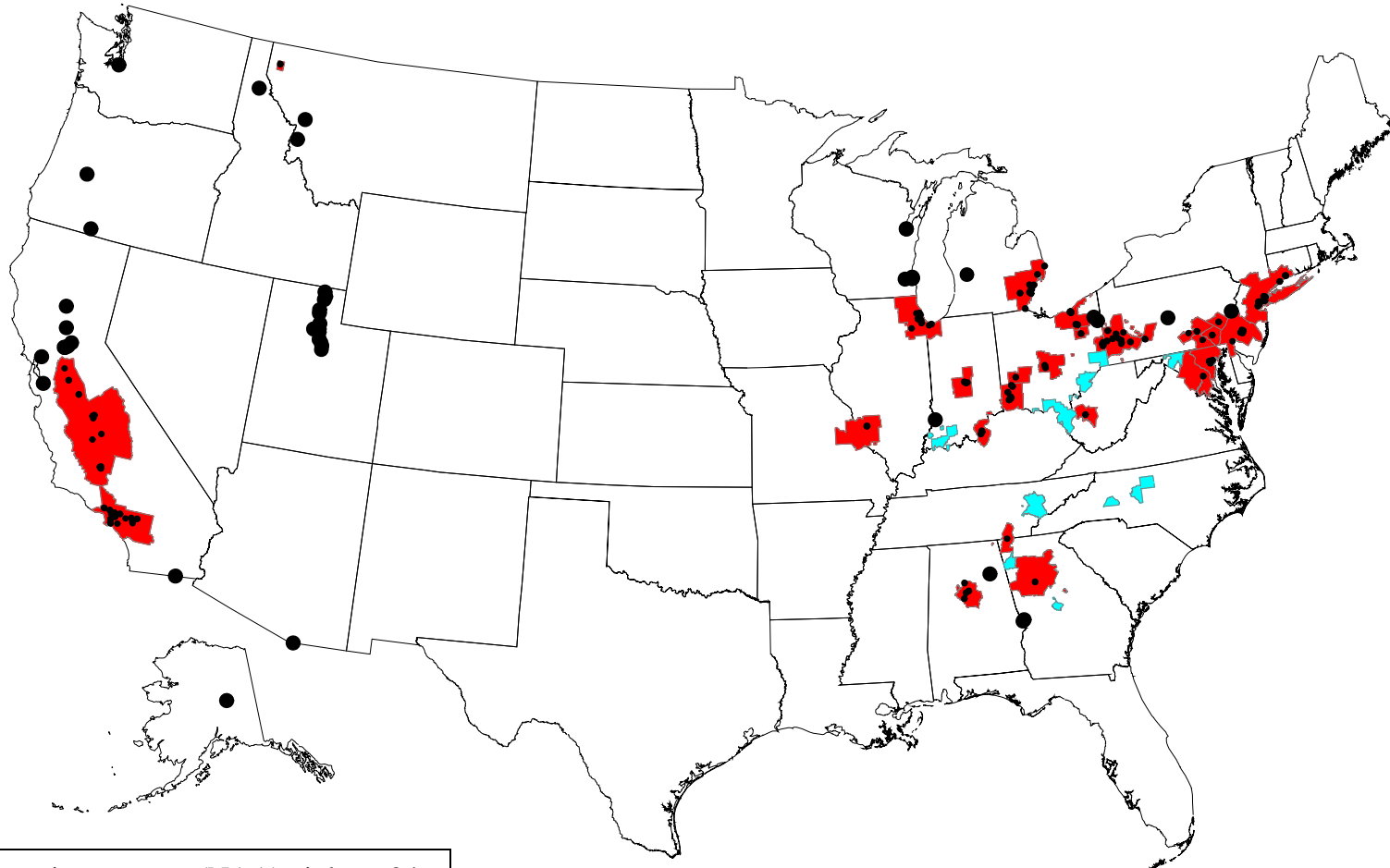
- Currently violating the Pm₁₀ standards
- Meeting the PM₁₀ standards
- With incomplete data

Number of Areas

11
29
7
47

Total Nonattainment Areas

Areas/Sites Violating the New 24-Hour PM_{2.5} NAAQS (based on 2004-2006 data)

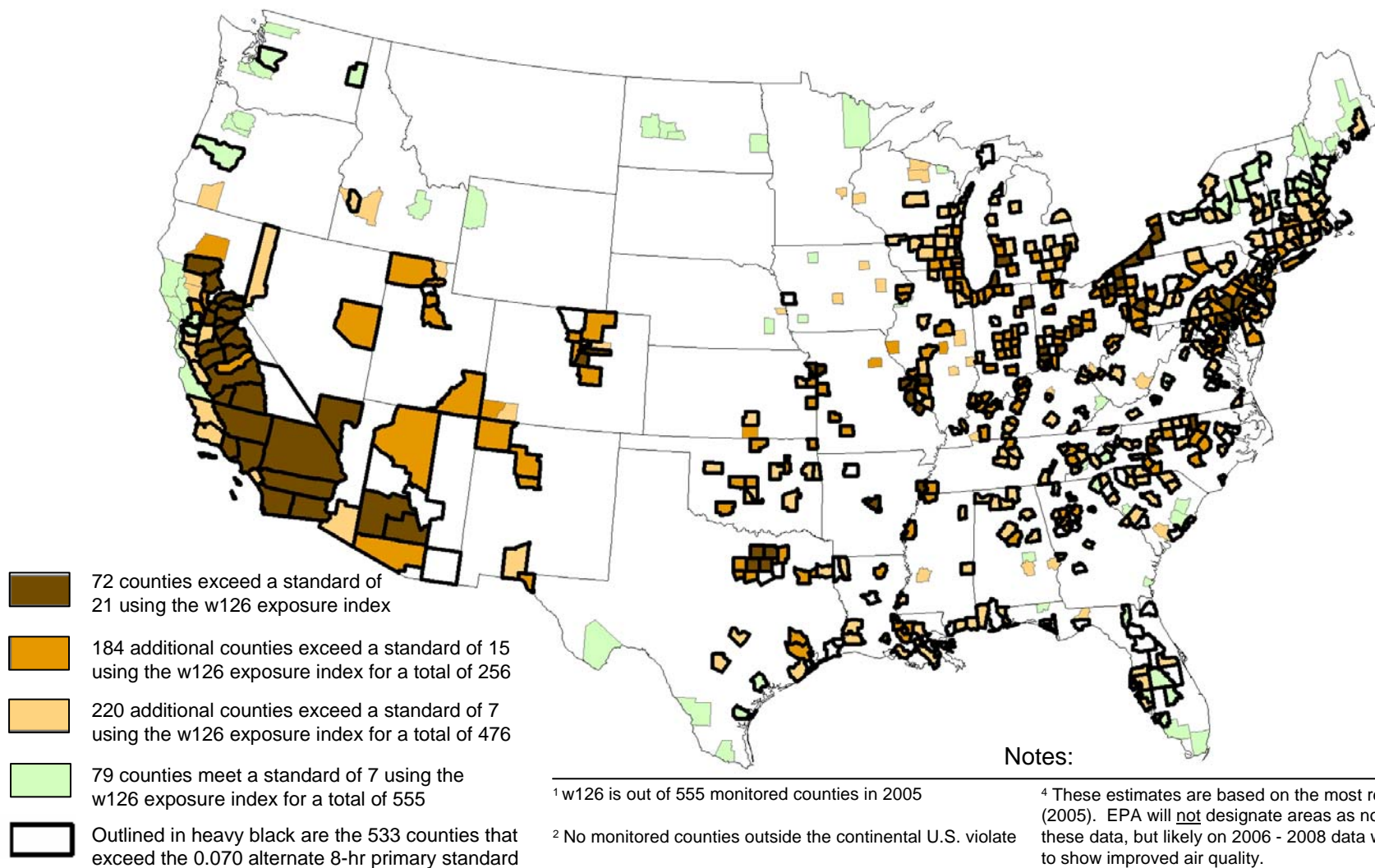


- Current nonattainment area (NAA) violates 24-hr NAAQS [29 areas]
- Current NAA meets 24-hr NAAQS [10 areas]
- Sites in current NAA violate the 24-hr NAAQS [131 sites / 29 areas]
- Sites not in a current NAA violate the 24-hr NAAQS [48 sites / 32 areas]

- 48 violating sites outside of current NAA are located in 27 areas:
 - 25 CBSAs: Largest are Seattle, Sacramento, San Jose, Milwaukee, Salt Lake City.
 - 2 State-Counties (not part of a CBSA): Shoshone ID; Ravalli MT
- States make initial recommendations for 24-hr designations using 2004-2006 data

Counties With Monitors Violating Alternative w126 Exposure Index Secondary Standard and 8-hour 0.070 Ozone Primary Standard

(Based on 2005 Air Quality Data for the w126 and 2003-2005 Air Quality Data for 0.070)



Notes:

¹ w126 is out of 555 monitored counties in 2005

² No monitored counties outside the continental U.S. violate

³ Monitored data can be obtained from the AQS system at <http://www.epa.gov/ttn/airs/airsaqs/>

⁴ These estimates are based on the most recent data (2005). EPA will not designate areas as nonattainment on these data, but likely on 2006 - 2008 data which we expect to show improved air quality.

Designing Control Strategies

- States must determine necessary level of reductions:
 - Correlating “base year” emissions and air quality levels, then projecting the level of emissions that will allow area to meet attainment by deadline
 - Determining appropriate mix of programs, controls that will achieve necessary emissions reductions (combination of State, local and Federal programs)
 - States do modeling; EPA provides support tools – air quality models, technical assistance, training
- States incorporate necessary controls into enforceable State Implementation Plan (SIP)
- Current air quality problems (ozone, PM, regional haze) involve extensive pollution transport so SIPs will rely on Federal programs to reach attainment

National Rules

- National/regional emissions caps (Title IV Acid Rain program, NOx SIP call, CAIR)
- Mobile source emissions standards
- New Source Review/Prevention of Significant Deterioration rules
- Consumer Products standards
- MACT standards (mainly toxics, but VOC controls affect ozone/PM)
- CTGs/ACTs – not national rules but important guidance for states

New Source Review

- CAA pre-construction permit program
 - Ensures air quality does not worsen where it is currently unhealthy
 - Ensures air quality does not significantly deteriorate where the air is currently clean
- Requires that a source install modern control equipment when it is built or when it makes a modification that increases emissions significantly
- Major and minor programs:
 - Major source Attainment NSR a.k.a. PSD ☆ attainment areas
 - Major source Nonattainment NSR ☆ nonattainment areas
 - Minor source NSR ☆ all other areas

New Source Review (cont.)

- Applies to emitters of NAAQS and other “regulated” pollutants
- Excludes air toxics (section 112 HAPs)
- Regulated Ozone pollutants are NO_x and VOCs
- Regulated PM_{2.5} pollutants* are:
 - direct PM_{2.5} and SO₂ always
 - NO_x unless State gets waiver
 - VOC and Ammonia only if State or EPA demonstrates it makes sense
 - Ammonia only a “local” regulated pollutant

* Pending final PM_{2.5} NSR rule

Title V Operating Permit Program

- ❑ 1990 CAA established Title V to promote compliance
- ❑ Consolidates a facility's CAA requirements into one "enforcement" document.
- ❑ Contains:
 - Reporting and recordkeeping requirements and compliance schedule
 - Requires periodic certification of compliance with CAA.
 - Requires self-reporting of any violations
 - Allows inspections of the facility by the permitting authority
- ❑ Issued to:
 - All major sources (10/25 tpy toxics, 10/25/50/100 tpy VOC, 100 tpy other)
 - Plus some non-majors (e.g., MACT area sources, HWIs)
 - Around 17,000 major sources nation-wide (including about 100 on Tribal land)
 - Around 19,000 synthetic minor sources
- ❑ State establishes program and is the issuing authority (and fee collector) except on Tribal lands
- ❑ Renewed every 5 years or possibly sooner when source requirements significantly change

Transportation Conformity

- ❑ Required under CAA section 176(c) to ensure that federally supported highway and transit project activities are consistent with (“conform to”) the purpose of the SIP (*see 40 CFR Subpart T 51.930*)
- ❑ Ensures transportation activities do not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant standards
- ❑ Applies to areas that are designated nonattainment, and those redesignated to attainment after 1990 (“maintenance areas” with SIPs developed under Clean Air Act section 175A) for transportation-related criteria pollutants: ozone, PM_{2.5}, PM₁₀, CO, NO₂

Public Involvement in SIP Development

- Review/comment on EPA implementation guidance/rules as they are being developed
- Review/comment on State- or Local-level analysis and plan development
 - Participate in stakeholder events/groups
 - Work directly with government officials
 - Review/comment on EPA approval actions
- Make EPA and other relevant authorities aware of implementation challenges