December 2005 Proposal to Revise the National Ambient Air Quality Standards for Particle Pollution

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Overview

- On December 20, 2005, EPA proposed revisions to the National Ambient Air Quality Standards (NAAQS) for particle pollution.
- The proposed revisions would strengthen a fine particle standard important for both health and visibility, and would improve and refocus the coarse particle standards on those particles that are associated with public health concerns.
- The proposed revisions address two categories of particle pollution:
  - *fine particles* ($PM_{2.5}$), which are 2.5 micrometers in diameter and smaller; and
  - *inhalable coarse particles* ($PM_{10-2.5}$), which are smaller than 10 micrometers in diameter but larger than $PM_{2.5}$.
- Simultaneously, EPA proposed amendments to its national air quality monitoring requirements, including those for monitoring particle pollution. The proposed changes include the design of a network to monitor $PM_{10-2.5}$.
- For more information on both proposals and the RIA:
  - http://www.epa.gov/air/particles/actions.html

Current PM NAAQS Review – Schedule

- Rulemaking on PM NAAQS:
  - ***Proposal*** signed on December 20, 2005 (as required by consent agreement)
  - ***Public comment*** period: 90 days, ends April 17, 2006
  - ***Public Hearings*** to be held March 8 in Philadelphia, Chicago and San Francisco
  - ***Final Rule*** to be signed by September 27, 2006 (required by consent agreement)

  - Proposal includes simultaneous rulemakings
    - PM NAAQS, Federal Reference Method, & Data Handling (Part 50)
    - Air Monitoring Regulations: Requirements for Reference and Equivalent Methods, Network Design Requirements (Parts 53 & 58)
  - Upcoming and related rulemakings:
    - Advance Notice of Proposed Rulemaking on Transition Issues (published 2/9/06)
    - Exceptional & Natural Events (to be signed March 1, 2006)

$PM_{2.5}$ – Primary 24-hour Standard

- Under the proposal, EPA would revise the level of the **24-hour standard** from the current level of ***65 µg/m³*** to ***35 µg/m³***.
  - EPA is proposing this change based on its assessment of a significantly expanded body of scientific information.
    - Studies show health effects at and below the level of the current standard

- EPA also is considering alternative levels for the 24-hour standard, between the range of 35 and 30 µg/m3 and is soliciting public comment on these levels.

- In addition, the Agency will take comment on alternative approaches for selecting the level of the standard, and on levels as high as the current level of 65 µg/m3 and as low as 25 µg/m3.

$PM_{2.5}$ – Primary Annual Standard

- EPA is proposing to retain the current **annual standard** at ***15 µg/m³***
  - EPA is proposing to retain this standard based on its assessment of several expanded, re-analyzed and new studies that have increased the Agency's confidence in associations between long-term $PM_{2.5}$ exposure and serious health effects, including heart and lung-related death.
- EPA is considering and is seeking public comment on lower alternatives for the annual standard including 14 and 13 µg/m³.
- In addition, the Agency will take comment on alternative views including a standard as low as 12 µg/m³.

$PM_{2.5}$ – Secondary Standards

- The proposal would set the **secondary standards** for both the annual and 24-hour standards at levels identical to the primary standards

- EPA also is taking comment on whether to set a separate $PM_{2.5}$ standard, designed to address visibility (principally in urban areas)
  - At levels within a range of 20 to 30 µg/m^3, and
  - On averaging times within a range of four to eight daylight hours

Potential Timeline if $PM_{2.5}$ NAAQS are Revised

Milestone	1997 $PM_{2.5}$ Primary NAAQS	2006 $PM_{2.5}$ Primary NAAQS
Promulgation of Standard	July 1997	Dec. 2006
State Recommendations to EPA	Feb. 2004 (based on 2001-2003 monitoring data)	Dec. 2007 (based on 2004-2006 monitoring data)
Final Designations Signature	Dec. 2004	Dec. 2009
Effective Date of Designations	April 2005	April 2010
SIPs Due	April 2008	April 2013
Attainment Date	April 2010 (based on 2007-2009 monitoring data)	April 2015 (based on 2012-2104 monitoring data)
Attainment Date with Extension	Up to April 2015	April 2020

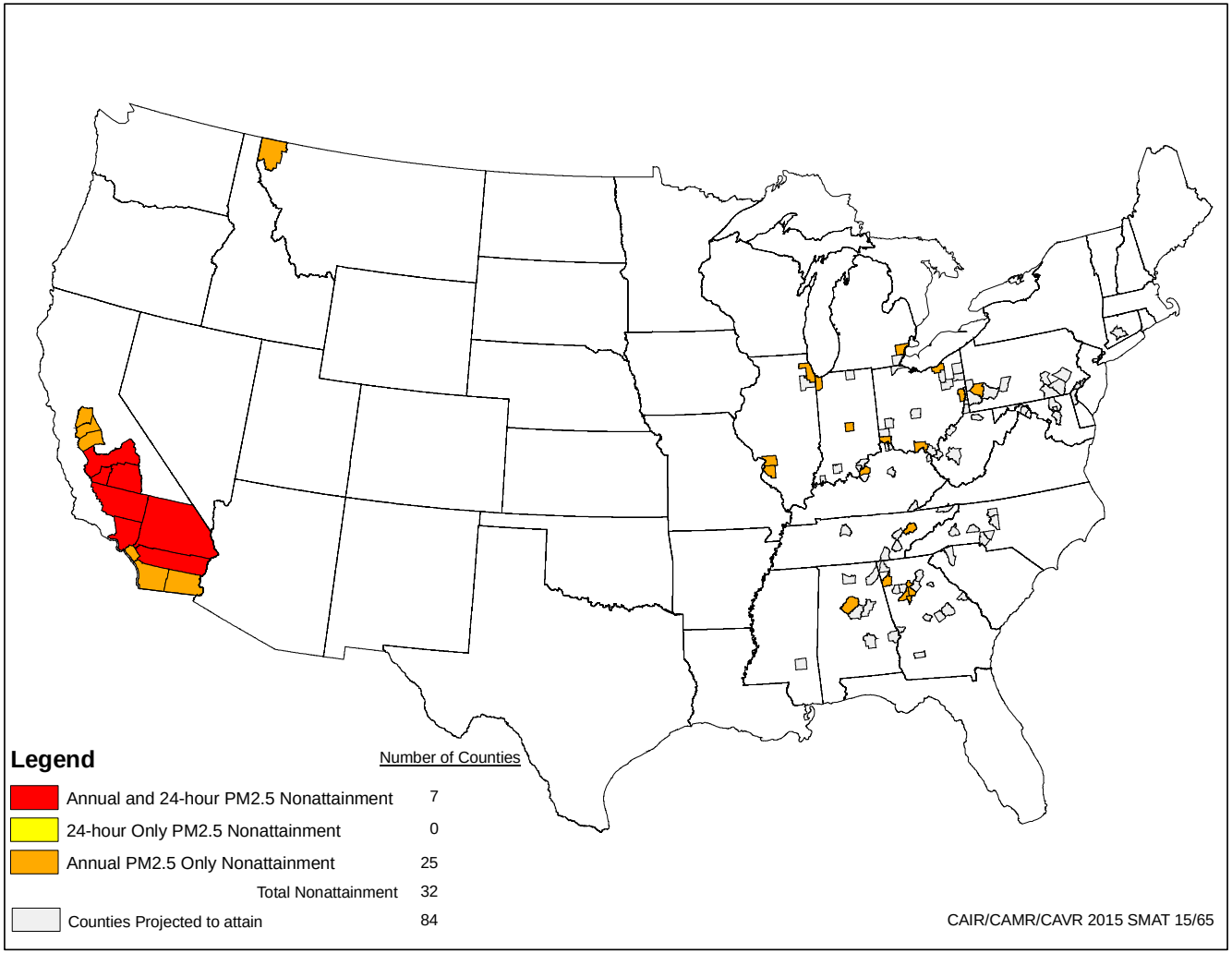
Summary of Counties Violating the PM2.5 Primary Standards

Current and Projected 2015

	Current			*Projected with CAIR/CAVR/CAMR**		
Standard Options	National	East	West	National	East	West
15/65—current standard	116	102	14	32	18	14
15/35	191	141	50	76	30	46
14/35	235	185	50	96	50	46
15/30	326	264	62	178	116	62

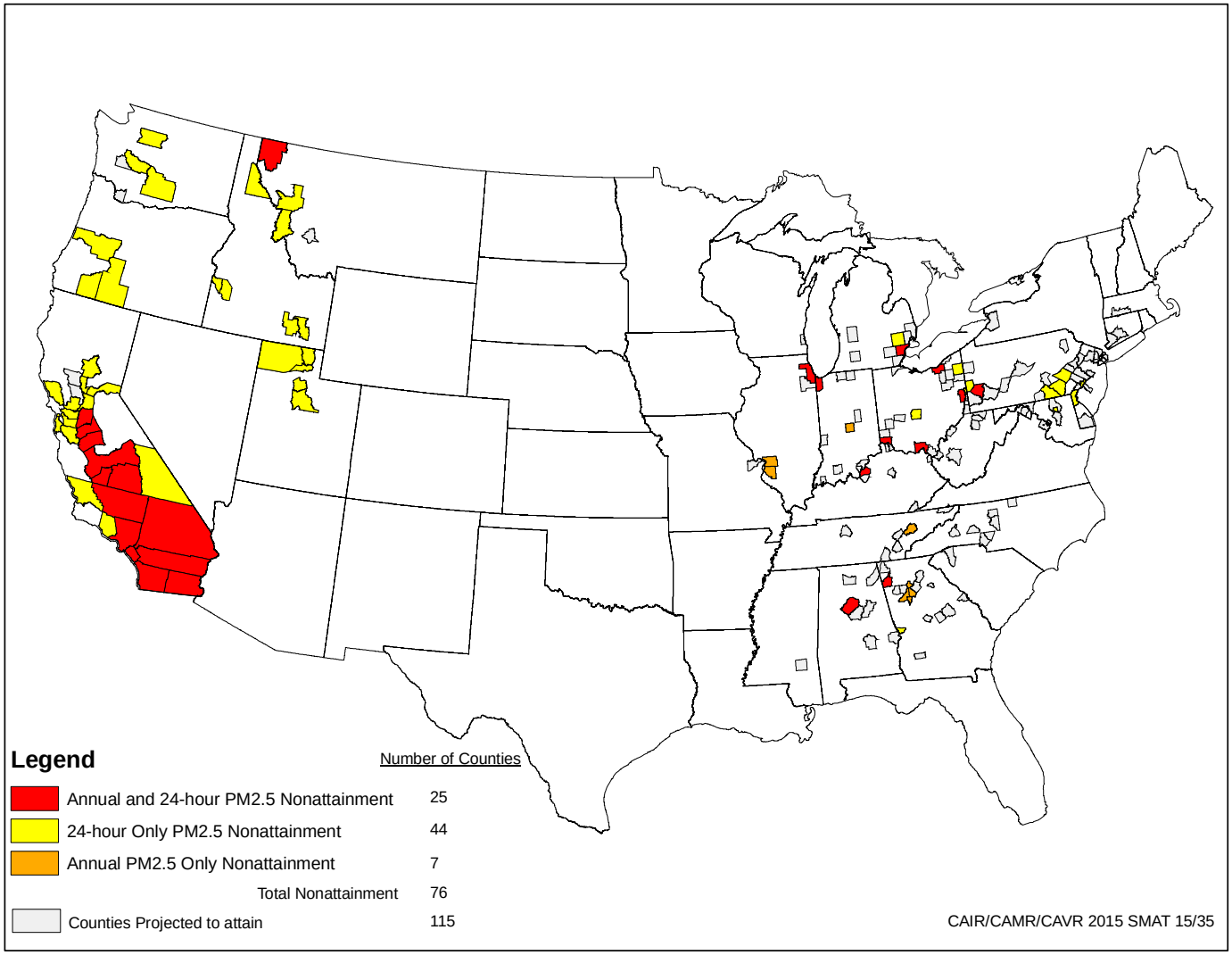
* See Technical Support Document for details on projection method used here (i.e., Speciated Modeled Attainment Test--SMAT).

Counties Projected to Exceed the PM2.5 NAAQS in 2015
Based on EPA Modeling*
Annual **15 ug/m3** and 24-Hour **65 ug/m3**



**EPA models assume implementation of CAIR/CAMR/CAVR, mobile source and other federal rules and existing state programs. Air quality is expected to be better than shown. This approach does not forecast actions states will take to meet current PM standards. Also note that modeled air quality forecasts are subject to a number of uncertainties.*

Counties Projected to Exceed the PM2.5 NAAQS in 2015
Based on EPA Modeling*
Annual **15 ug/m3** and 24-Hour **35 ug/m3**



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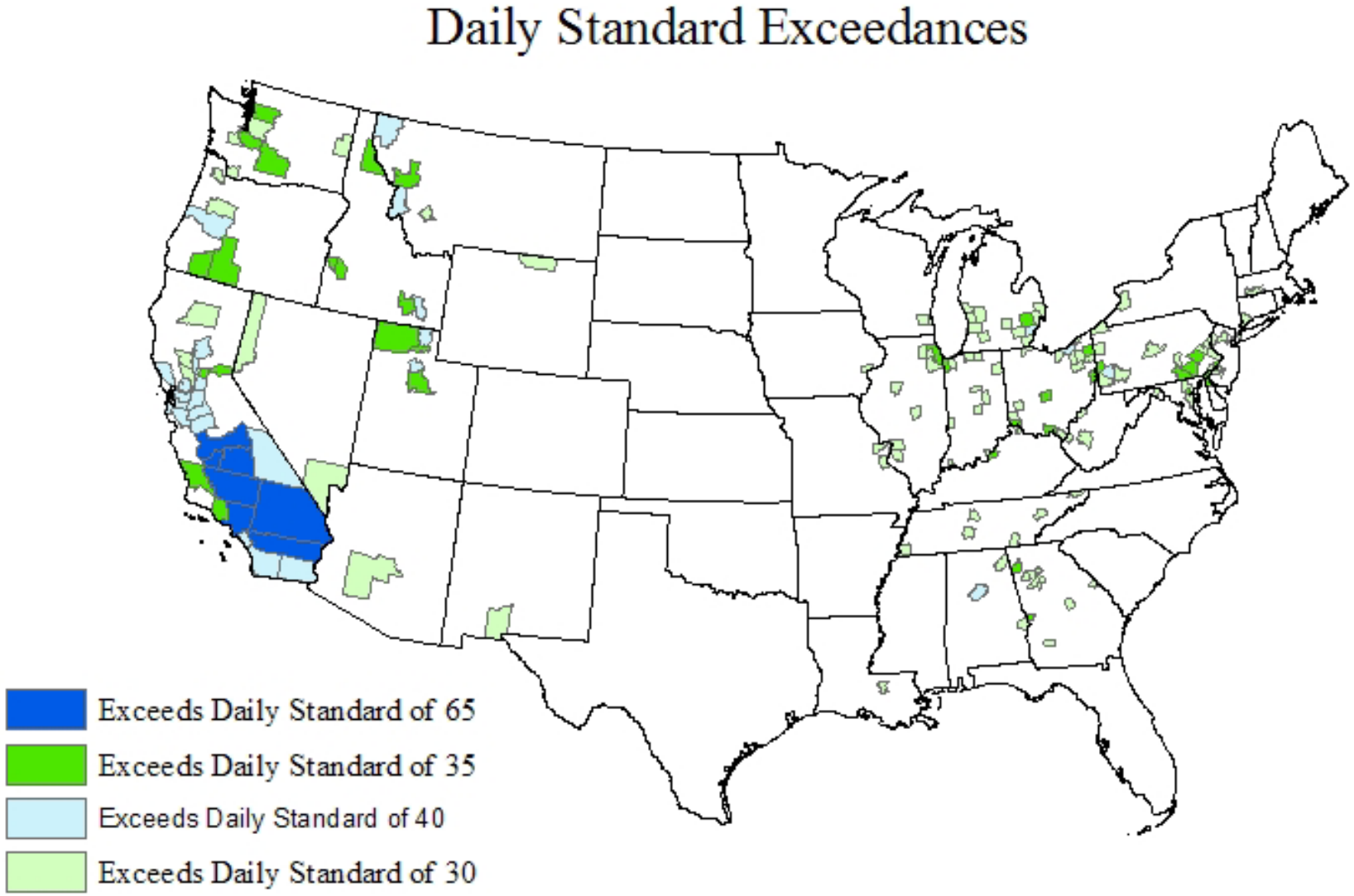


2015 Base Case Scenario

Interim RIA (January 2006)

- Focused on $PM_{2.5}$ NAAQS only
- Conducted "illustrative" analyses for 5 areas predicted to violate one or more NAAQS alternatives by 2015: Atlanta, Chicago, NY/Philadelphia, San Joaquin, Seattle
- Focused on local controls for current NAAQS and proposed alternative (after CAIR/CAMR/CAVR + mobile source rules)
- Projected only to 2015
- Did not produce national cost-benefit numbers due to limitations in time, available information, and technical capabilities

Final RIA (September 2006)

- Major focus on $PM_{2.5}$
- Will project nationwide costs and benefits
- Will project to 2020 (full attainment year)
- Will still give preference to local controls for achieving reductions beyond CAIR/CAMR/CAVR + mobile, except in analysis for most stringent alternatives

Inhalable Coarse PM – Moving from PM_{10} to $PM_{10-2.5}$

- EPA's current standards for coarse particles (PM_{10}) were set in 1987.

- These standards – a 24-hour standard of 150 µg/m^3, and an annual standard of 50 µg/m^3 -- apply to particles 10 micrometers in diameter and smaller.

- The proposed revisions would change the definition of standard so that it covers only particles between 10 and 2.5 micrometers in diameter also known as $PM_{10-2.5}$ or "inhalable coarse particles."

$PM_{10-2.5}$ Standards

- The proposed **new $PM_{10-2.5}$ standard** would be a **24-hour standard**, at 70 µg/m^3.

- EPA is not proposing an annual standard for $PM_{10-2.5}$.
  - There is not sufficient scientific evidence to support a long-term standard for coarse particles

- Under the proposal, the **secondary** 24-hour standard for $PM_{10-2.5}$ would be identical to the primary standard.

Inhalable Coarse PM – Moving from PM_{10} to $PM_{10-2.5}$

- EPA proposes to qualify coarse PM to include:
  - Any ambient mix of $PM_{10-2.5}$ that is dominated by resuspended dust from high-density traffic on paved roads and PM generated by industrial sources and construction sources.
  - This definition ***excludes*** any ambient mix of $PM_{10-2.5}$ that is dominated by rural windblown dust and soils and PM generated by ***agricultural*** and ***mining*** sources.
  - Agricultural sources, mining sources, and other similar sources of crustal material shall not be subject to control in meeting this standard
- The indicator is not defined or limited to any specific geographic area, but includes a mix of $PM_{10-2.5}$ in any location that is dominated by these sources.

Inhalable Coarse PM – Moving from PM_{10} to $PM_{10-2.5}$

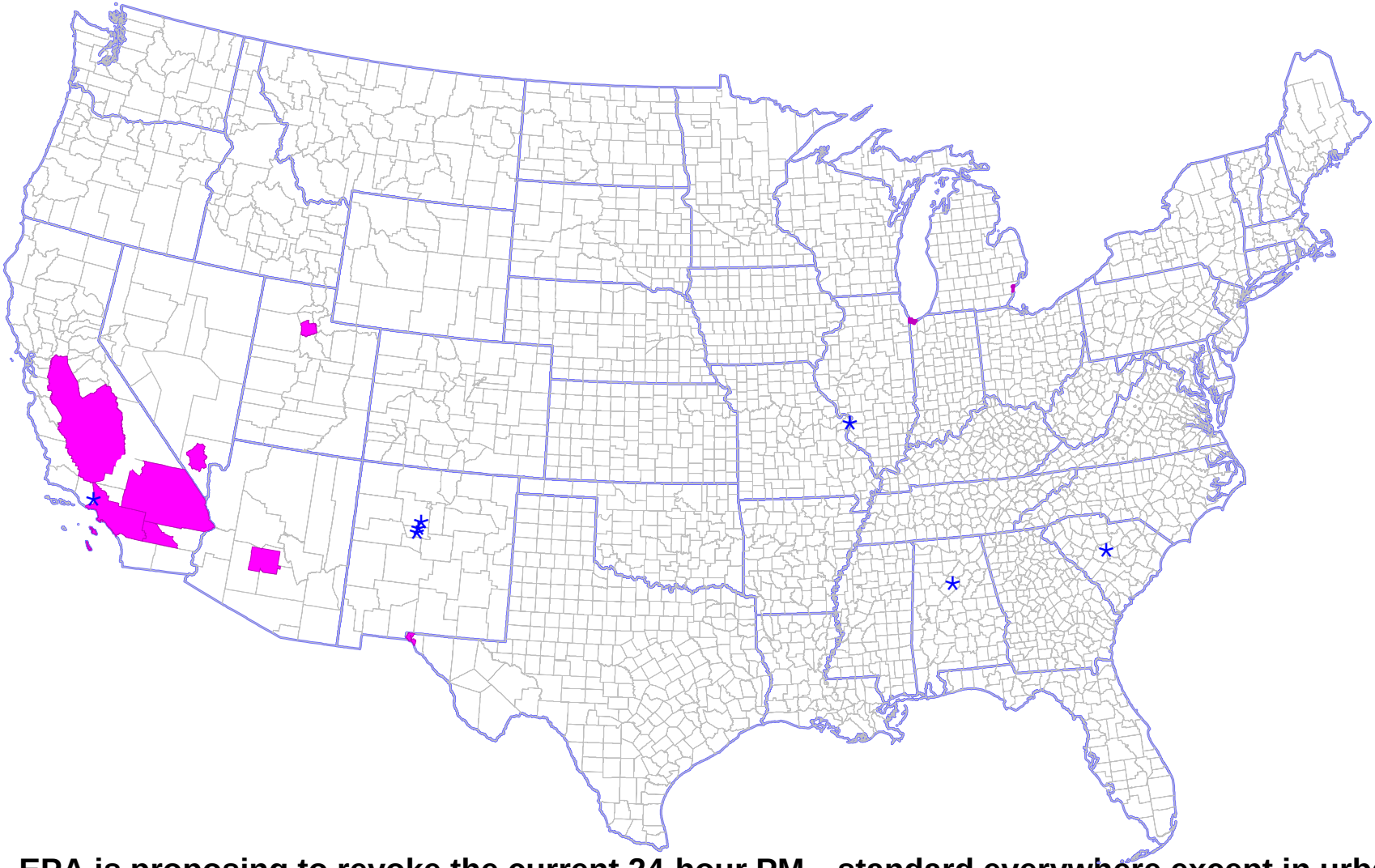
- With the proposed indicator, each area in the country would fall into one of these two categories:
  (1) the majority of the ambient mix of $PM_{10-2.5}$ in an area is resuspended dust from high-density traffic on paved roads and PM generated by industrial sources and construction sources; or
  (2) the majority of the ambient mix is rural windblown dust and soils and PM generated by agricultural and mining sources.
- Monitoring only required in MSAs with urbanized areas of 100,000 people or more.
  – Zero to 5 required monitors per MSA based on population and estimated historical concentrations.
  – Total of about 225-250 monitors required in approximately 150 MSAs.

Revoking the Current PM_{10} Standard

- EPA is proposing to revoke the **current <u>24-hour</u> PM_{10} standard**, except in urbanized areas that have both:
  1) one or more violating PM_{10} monitors; and
  2) a population of 100,000 or more.
  - This standard would remain in place in these areas until the Agency has completed attainment and nonattainment designations for $PM_{10-2.5}$.
  - EPA is taking comment on whether the 24-hour PM_{10} standard should be retained in areas with a population less than 100,000 but where the majority of the ambient mix of $PM_{10-2.5}$ is generated by high density traffic on paved roads, industrial sources, and construction sources.

- The Agency is proposing to immediately revoke the **current <u>annual</u> PM_{10} standard** in all areas.
  - Current scientific evidence does not show significant public health risks associated long-term exposure to coarse particles.

Locations where EPA Proposes to Retain the 24-Hour PM10 Standard

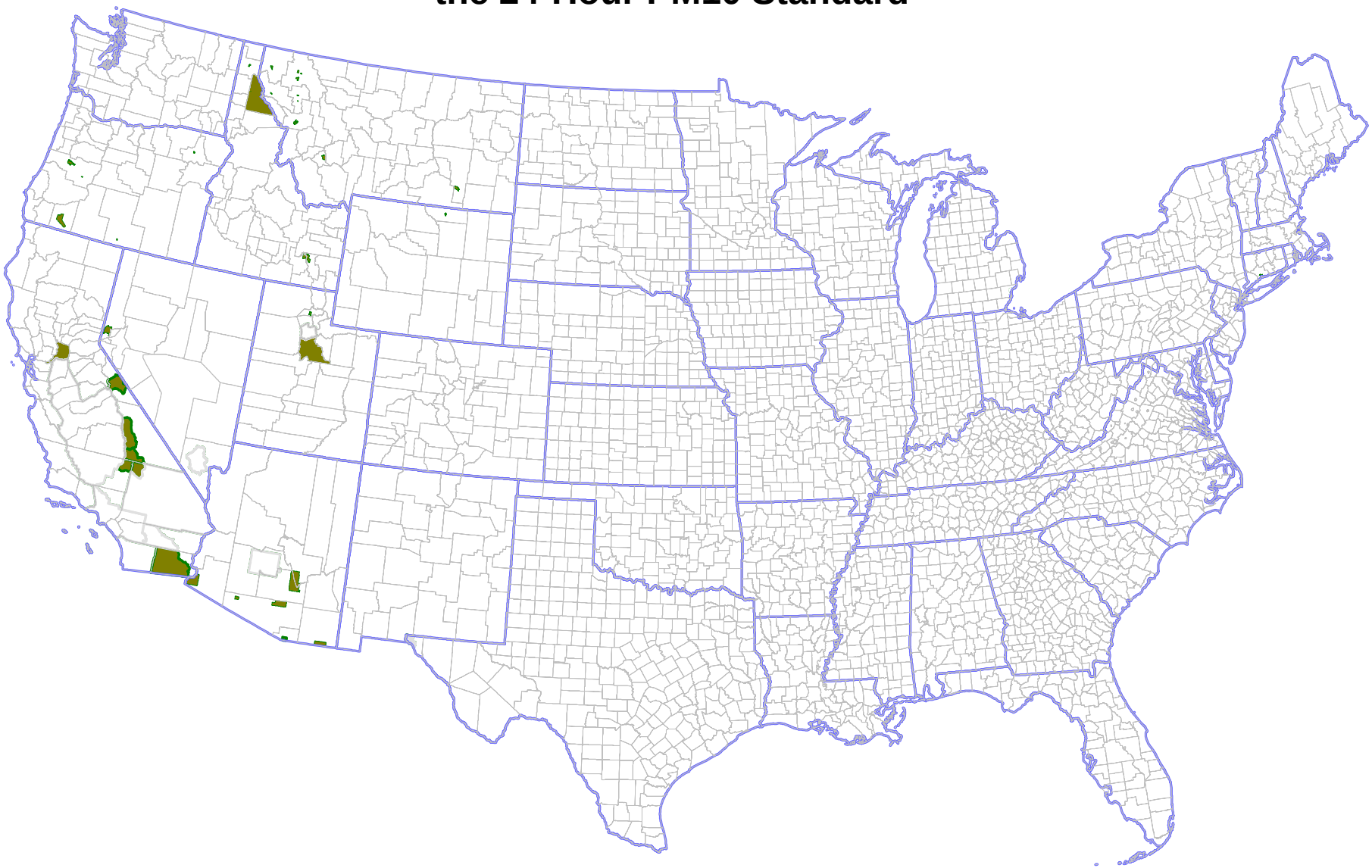


EPA is proposing to revoke the current 24-hour PM_{10} standard everywhere except in urbanized areas that have a minimum population of 100,000 and that contain a monitor which violates the 24-hour PM_{10} standard based on the most recent three years of data. These include:

Current PM_{10} Nonattainment and Maintenance Areas

Other counties with violating monitors

Current PM_{10} Nonattainment Areas where EPA Proposes to Revoke the 24-Hour PM10 Standard

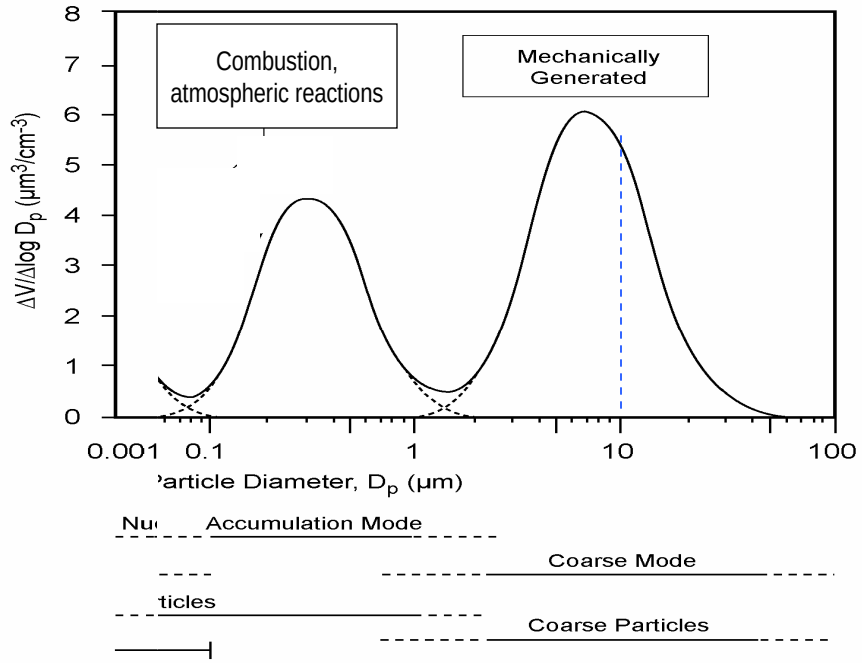


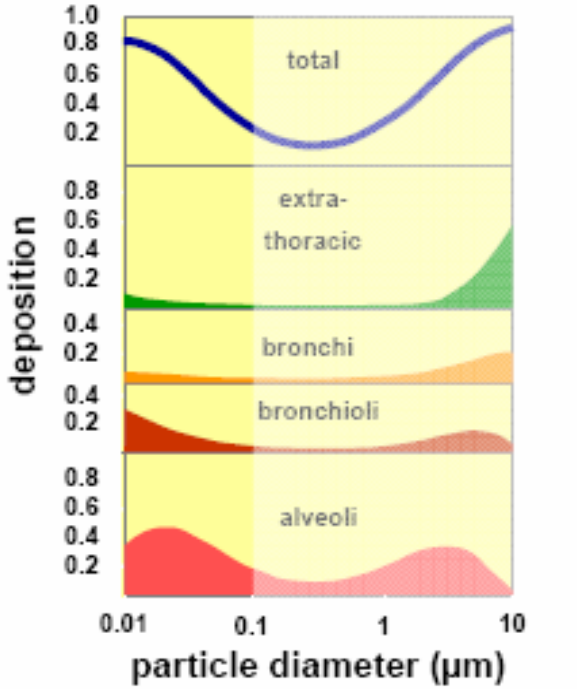
Potential Timeline if $PM_{10-2.5}$ Standard is Finalized

Milestone	2006 $PM_{10-2.5}$ NAAQS
Effective date of Standard	Dec. 2006
State Recommendations to EPA	July 2012 (based on 2009-2011 monitoring data)
Final Designations	May 2013
Effective Date of Designations	**July 2013**
SIPs Due	**July 2016**
Attainment Date	July 2018 (based on 2015-2017 monitoring data)
Attainment Date with Extension	**Up to July 2023**

Rationale for PM10 Indicator

•1971: set NAAQS for “total suspended particulate” (particles smaller than ~25-45 µm in diameter)
•1987: revised PM NAAQS, changing the indicator from TSP to PM10 to focus on “inhalable” or “thoracic" particles (< 10 µm) based on particle dosimetry

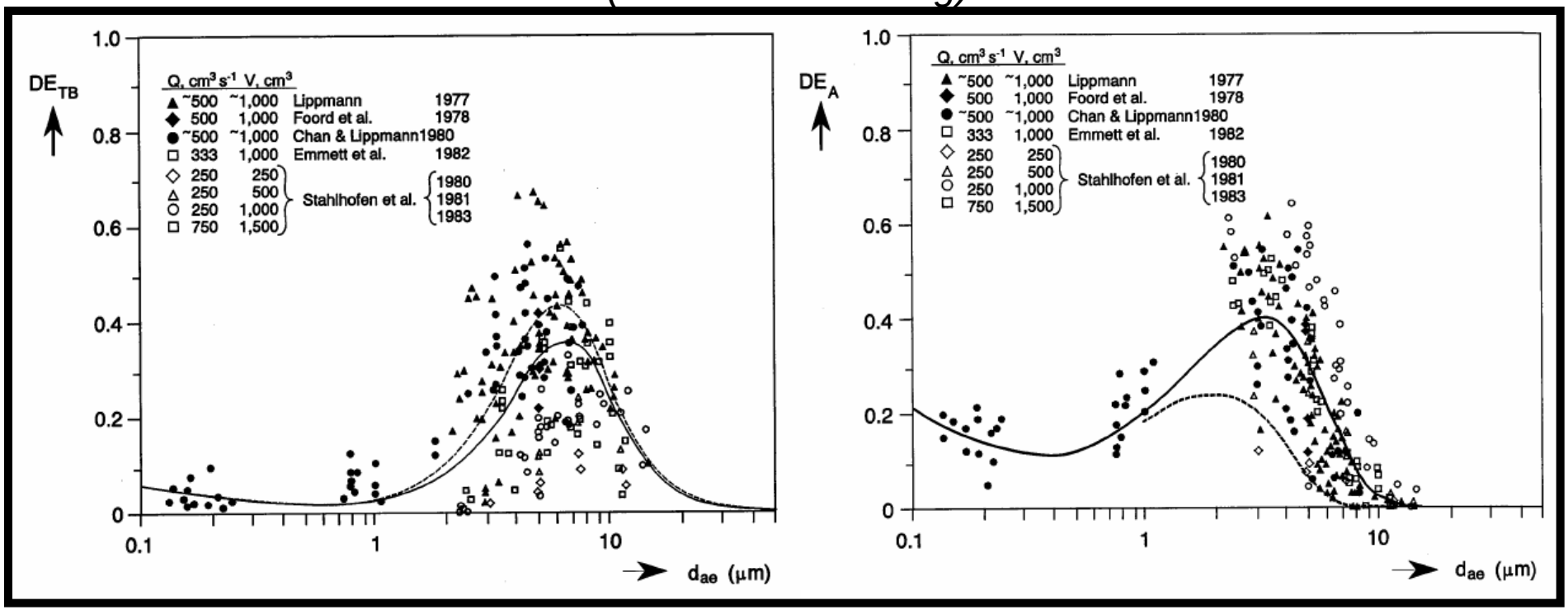




ICRP 66 (1994); MPPDep (2000): based on experimental data

Particle Deposition by Size

(Oronasal breathing)



Tracheobronchial Region **Alveolar Region**

Deposition of Phoenix Particle Distribution

Daily mass deposition (ug/day) by thoracic region (PM CD)