



PM_{2.5} Annual NAAQS Update

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Agenda

- Clean Air Act
- National Ambient Air Quality Standards
- PM_{2.5}
- Breaking it down
- Looking Ahead
- Final Thoughts



Clean Air Act Requirements



Clean Air Act Requirements

- Section 108 and 109 of CAA
- Set National Ambient Air Quality Standards
 - Primary standards - to protect human health
 - ▶ Specifically, the sensitive populations
- Secondary standards – to protect public welfare
 - Protection against:
 - ▶ Decreased visibility
 - ▶ Damage to animals, crops, vegetation and buildings
- Requires “a review of the criteria published” and recommend any new NAAQS or revisions of existing criteria at 5-year intervals
- Rigorous assessments
 - Integrated Science Assessment (ISA) – Policy review/basis
 - Risk/Exposure Assessment (REA) – Quantitative risks to human health and environment
 - Policy Assessment (PA) – Assessment to inform CASAC’s advice to EPA on standards and potential revisions
 - ▶ Indicator, averaging time, form and level
 - Rulemaking



National Ambient Air Quality Standards (NAAQS)



NAAQS

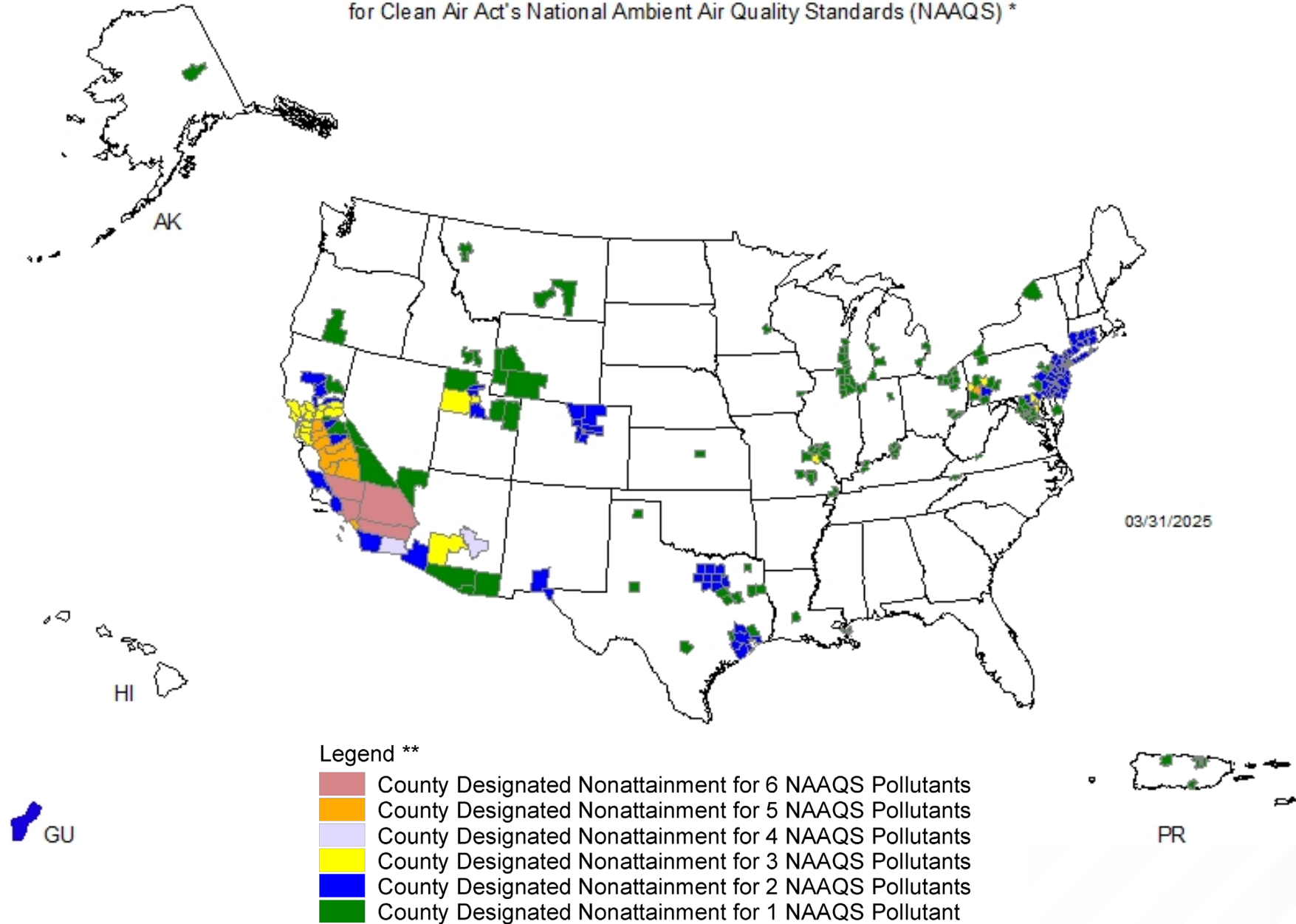
Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3- month Ave.	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide (NO ₂)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily max 8-hour conc, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	9.0 µg/m ³	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on ave over 3 years
Sulfur Dioxide (SO ₂)		primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily max. conc. averaged over 3 years
		secondary	1 year	10 ppb	Annual mean, averaged over 3 years





Counties Designated "Nonattainment"

for Clean Air Act's National Ambient Air Quality Standards (NAAQS) *



Other Rules

Other regulations and requirements address PM_{2.5}

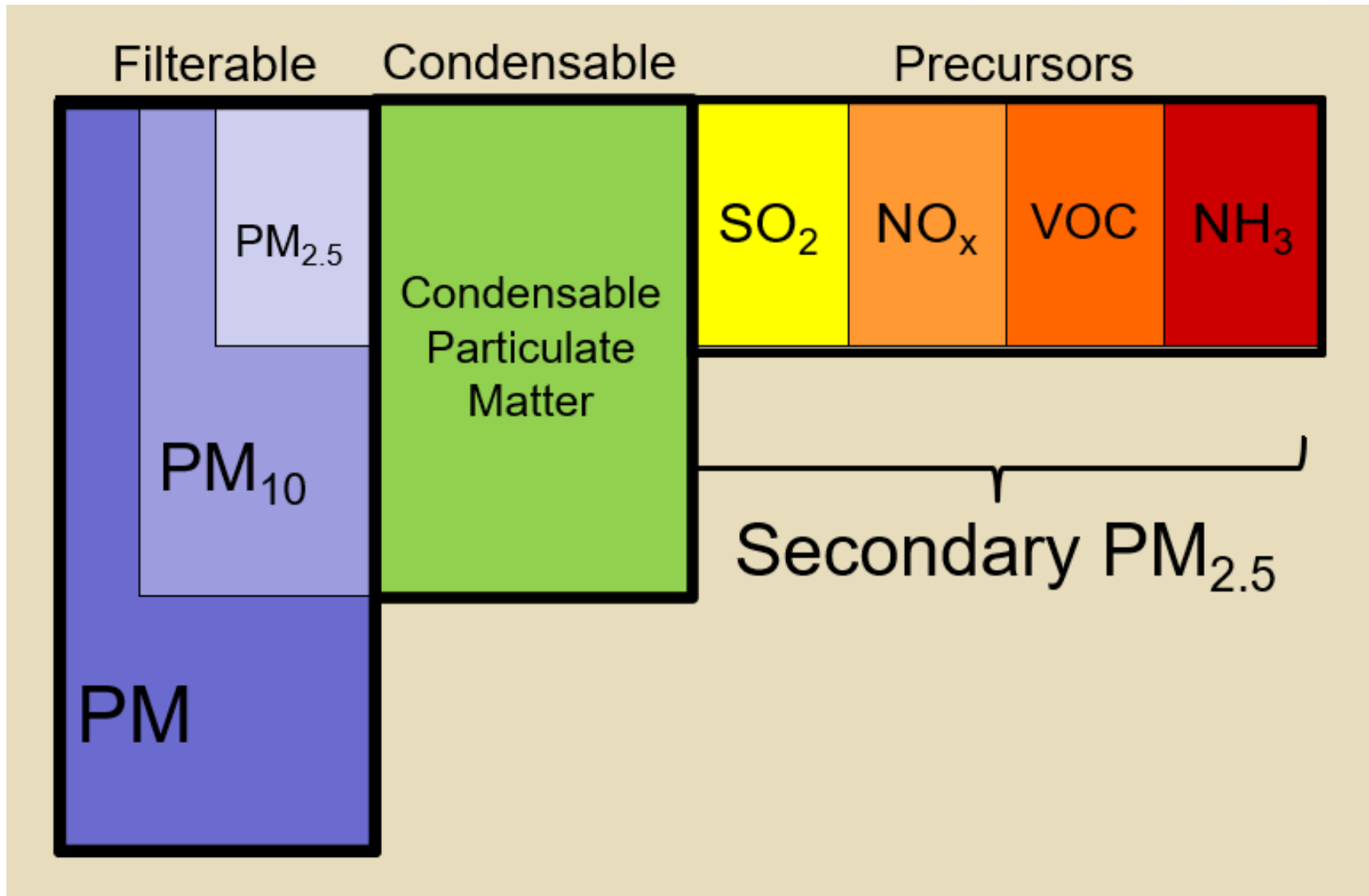
- Clean Air Interstate Rule (CAIR)
- Cross State Air Pollution Rule (CSAPR)
- Ozone Transport Region (OTR)
- Regional Haze (BART)
- RACT/LAER/BACT



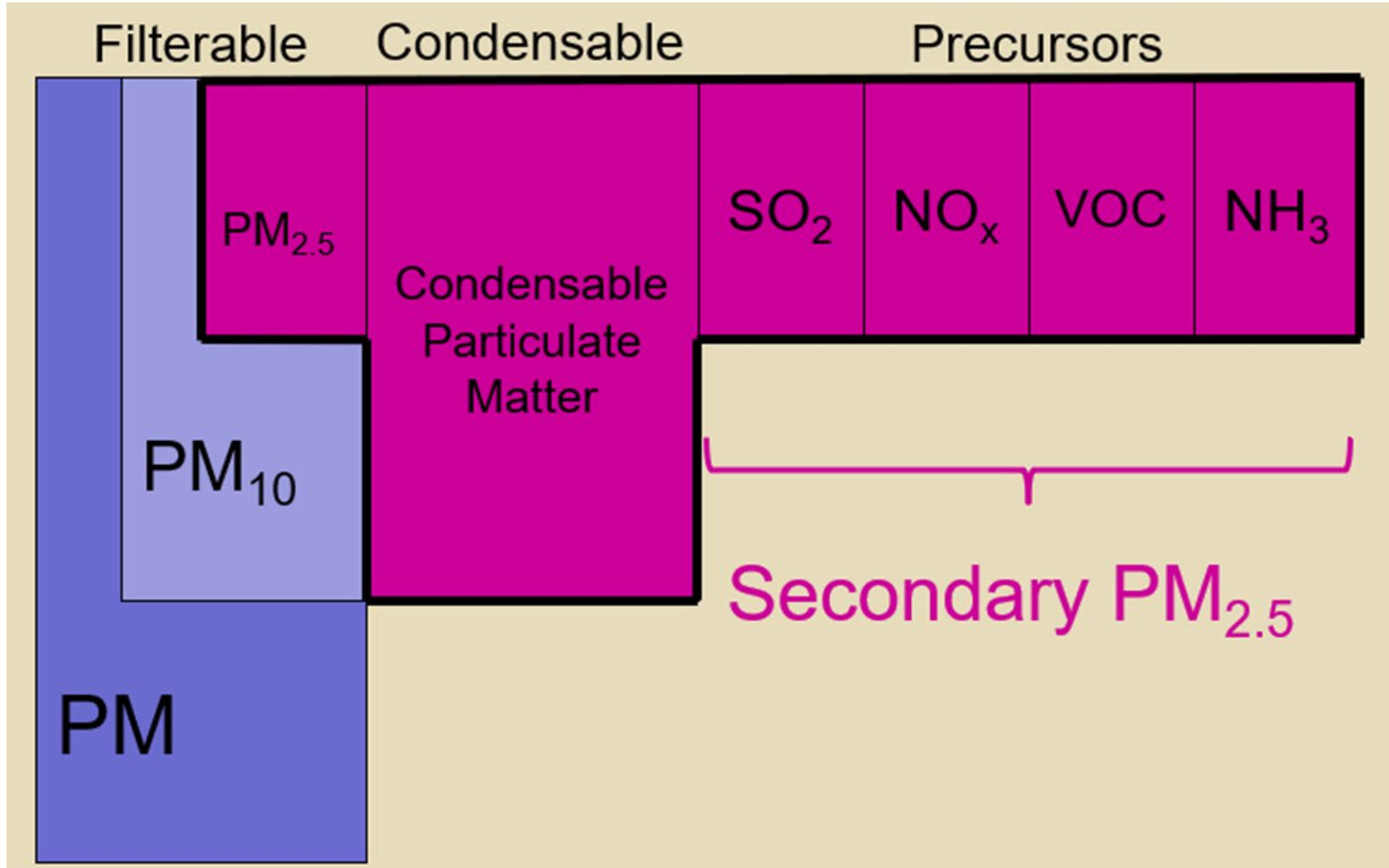
Particulate Matter (PM_{2.5})



Particulate Matter



PM_{2.5}



PM_{2.5} Emissions

- Identified as the most harmful to humans
- PM_{2.5} methods for quantification continue to evolve
- Methodology for secondary PM_{2.5} (MERPS)
- As methodology for quantifying emission emerges, available NAAQS seem to be less
- High background concentrations
 - US average ~ 4 to 9 µg/m³



PM_{2.5} NAAQS

Year	Averaging Period	Level	Form
1997	24 hour	65 µg/m³	98 th percentile, averaged over 3 years
1997	Annual	15 µg/m³	Mean, averaged over 3 years
2006	24 hour	35 µg/m³	98 th percentile, averaged over 3 years
2006	Annual	15 µg/m³	Mean, averaged over 3 years
2012	24 hour	35 µg/m³	98 th percentile, averaged over 3 years
2012	Annual	12 µg/m³	Mean, averaged over 3 years
2020	No change		
2024	Annual	9 µg/m³	Mean, averaged over 3 years
2025	New Administration plans to review PM _{2.5} NAAQS – unknown implications		



PM_{2.5} NAAQS

PM-2.5 Nonattainment Areas (2012 Standard)



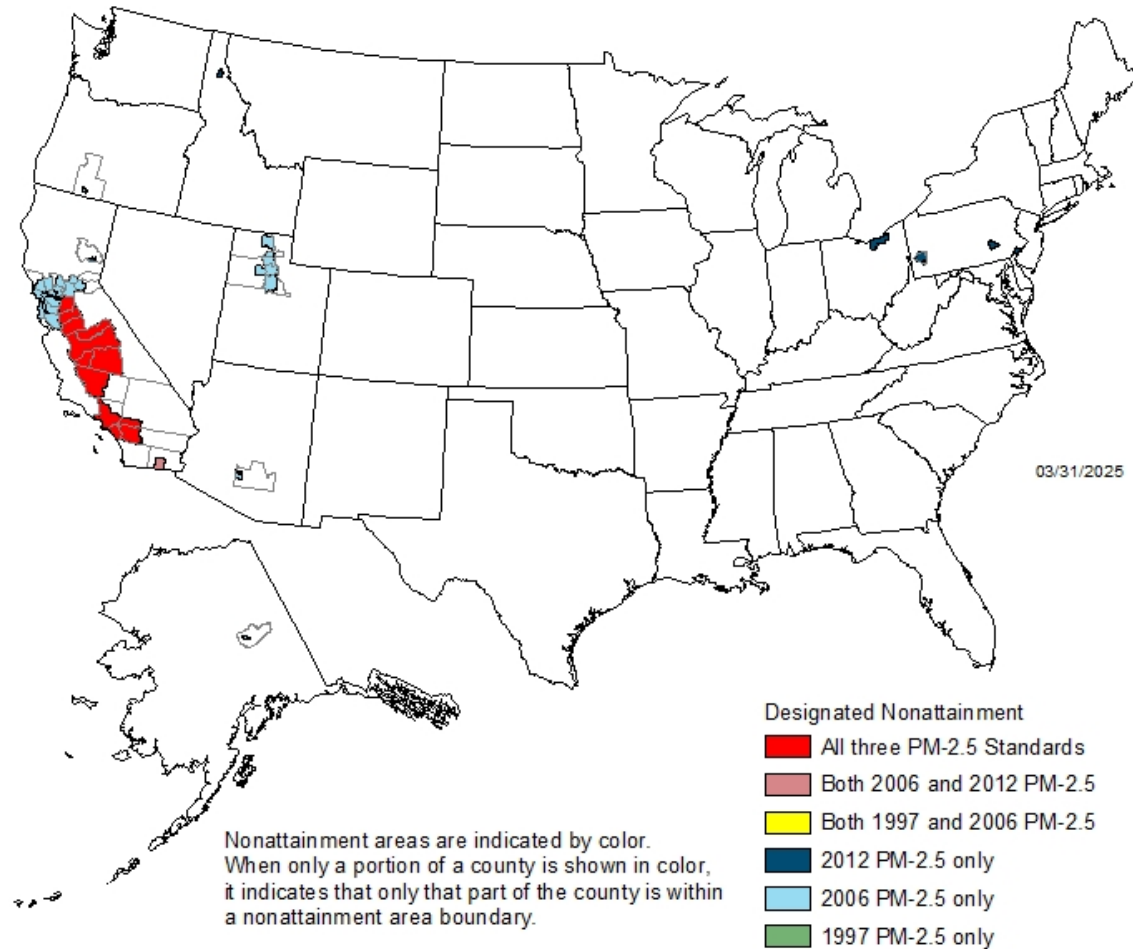
Source: USEPA, 2025
Green Book

Nonattainment areas are indicated by color.
When only a portion of a county is shown in color,
it indicates that only that part of the county is within
a nonattainment area boundary.



PM_{2.5} NAAQS

Counties Designated Nonattainment
for PM-2.5 (1997, 2006, and/or 2012 Standards)



Source: USEPA, 2025
Green Book

PM_{2.5} Status

- Dec 2020 – EPA issues a final rule to not revise the PM NAAQS
- Jan 2021 – Lawsuits
- Jan 2021 – Biden Executive Order
- June 2021 – EPA announces reconsideration of PM NAAQS
- Feb 2022 – EPA’s CASAC recommends tightening PM standard
- May 2022 – CASAC issues PA
 - Annual lowered to 8 to 12 µg/m³ but retained 24-hour at 35 µg/m³
- Aug 2022 – Proposed rule to OMB for inter-agency review
- February 2024 – EPA strengthens the annual health-based standard for fine particles to 9.0 µg/m³, after advice from CASAC and 700,000 public comments
- March 6, 2024 – Final rule published lowering annual standard to 9.0 µg/m³
- May 6, 2024 – Effective date of final rule
- April 30, 2024 – EPA revises the Significant Impact Level for annual PM_{2.5} to 0.13 µg/m³
- **March 12, 2025 – Trump Administration announces that the EPA is revisiting Biden PM_{2.5} NAAQS to “aid manufacturing, small businesses”**





Timeline: Area Designations and Plans



Within 2 years after a final NAAQS: EPA must "designate" areas as meeting (attainment areas) or not meeting (nonattainment areas) the final NAAQS considering the most recent air quality monitoring data

Within 3 years after a final NAAQS: All states must submit state implementation plan revisions to show they have the air quality management program components in place to implement the final NAAQS

Within 18 months after the effective date of designations: Nonattainment area PM_{2.5} state implementation plans are due.

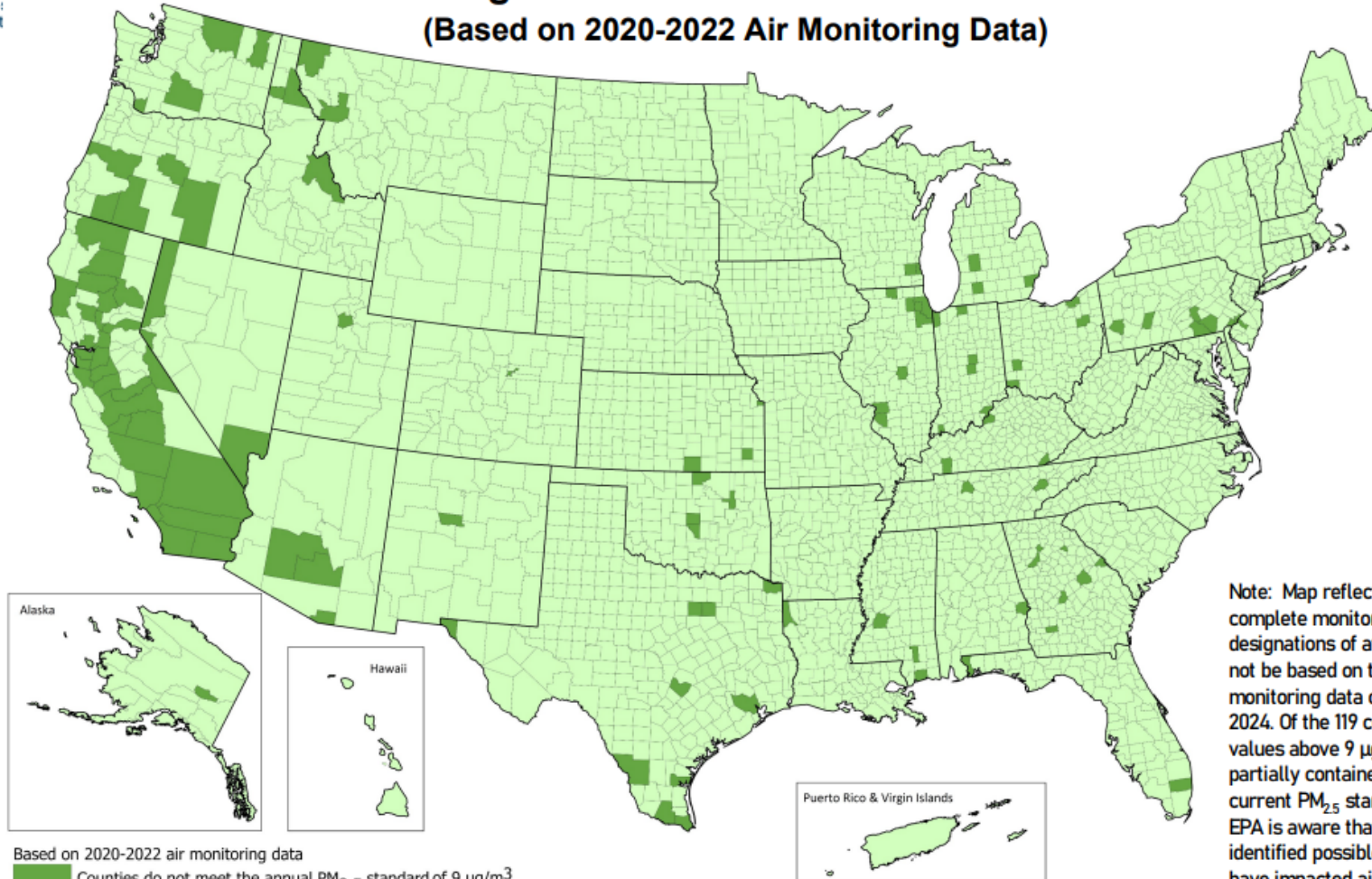
End of the 6th calendar year after the effective date of designations: "Moderate" area attainment date.

*All PM_{2.5} nonattainment areas are initially designated as "Moderate."

2020-2022 Data



Most Counties with Monitors Already Meet the Strengthened Particle Pollution Standard (Based on 2020-2022 Air Monitoring Data)



Based on 2020-2022 air monitoring data
Counties do not meet the annual PM_{2.5} standard of 9 ug/m³

This information is provided for illustrative purposes only and is not intended to predict the outcome of any forthcoming designations process.

Note: Map reflects monitored counties with complete monitoring data. Future final designations of attainment/nonattainment will not be based on these data, but likely on monitoring data collected between 2022 and 2024. Of the 119 counties with 2020-2022 design values above 9 ug/m³, 59 counties are totally or partially contained in nonattainment areas for current PM_{2.5} standards. In years 2021 and 2022, EPA is aware that some states have already identified possible exceptional events that may have impacted air quality in the US and may be relevant to designations decisions.



PM_{2.5} Annual NAAQS Designations

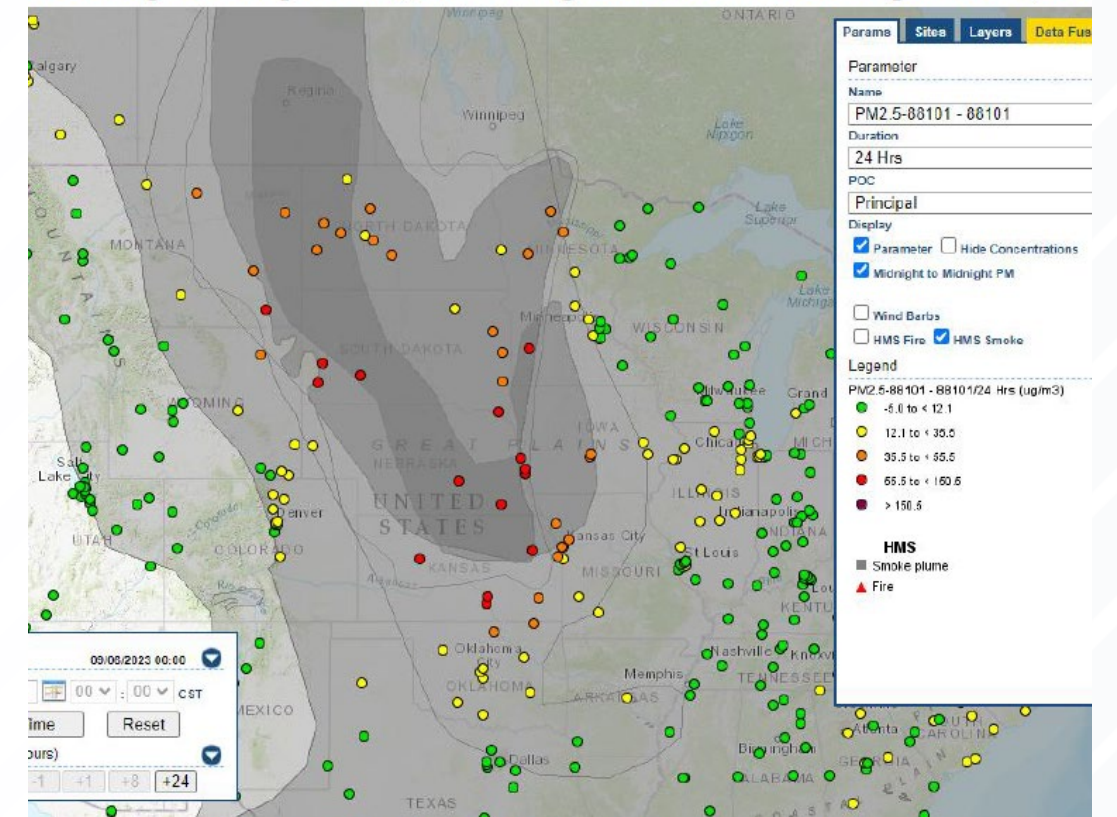
→ Continuous PM Monitors Bias

- February 2, 2024- March 6, 2024 - EPA takes comment on “Proposed Update of PM_{2.5} Data From T640/T640X PM Mass Monitors”
- May 13, 2024 - EPA retroactively applied equations to all the hourly T640 and T640X PM_{2.5} concentrations in the EPA’s AQS data beginning in 2017

→ Exceptional Events

- 2016 rule which allows for “Exceptional Events” to be removed from data for NAAQS attainment determinations
- Sets standards for evaluating the data
- April 2024 – EPA developed three products to assist with demonstration of Exceptional Events
 - ▶ Includes data visualization tools for prescribed fires and wildfires
 - ▶ Includes Tiering methodology depending on thresholds

II-10. Regional Map of PM_{2.5} Monitoring Sites and Smoke for September 6, 2022

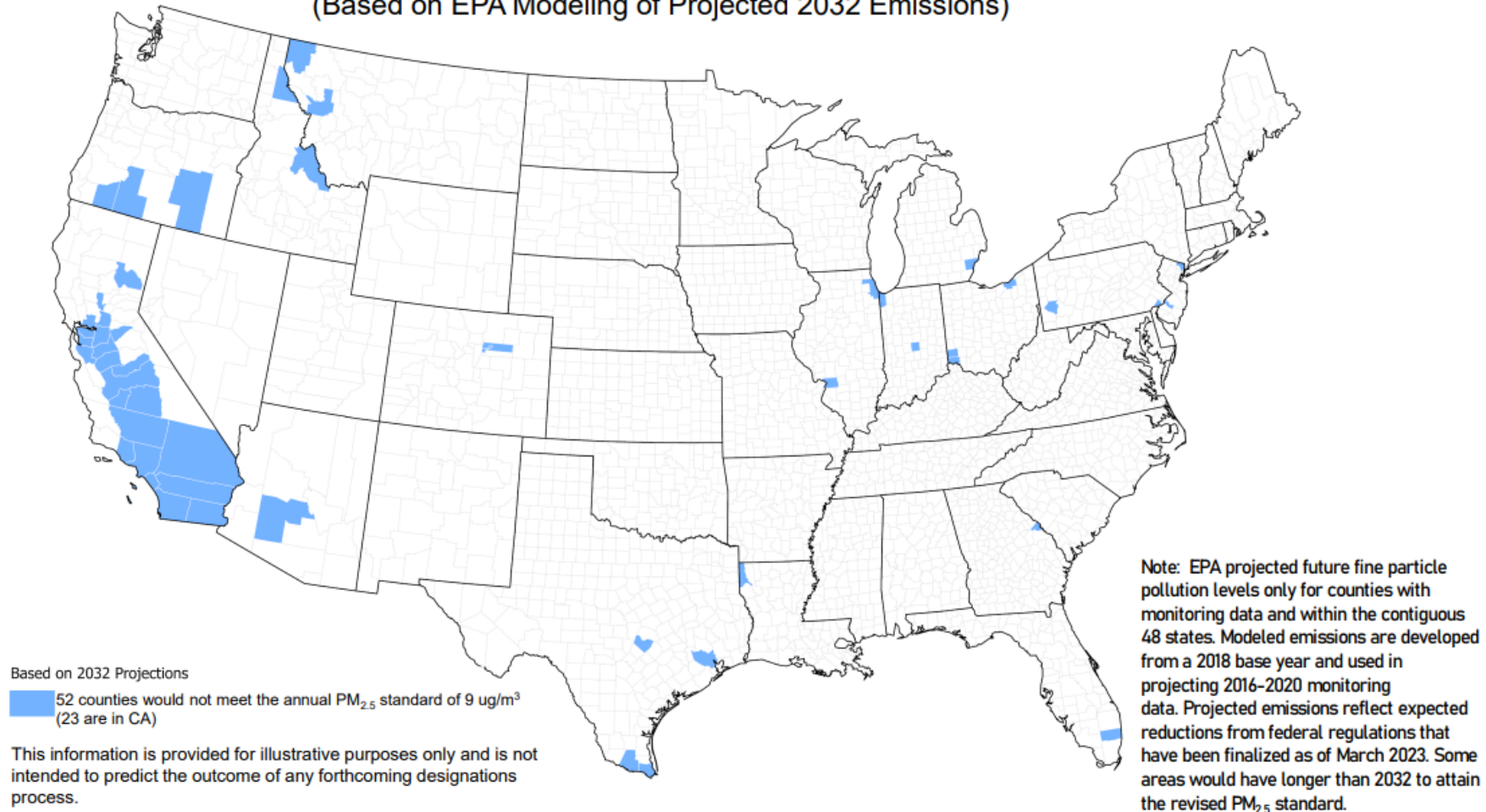


plumes (gray) and monitoring locations with PM_{2.5} values colored by AQI category, from EPA website (<http://www.airnowtech.org>).

2032 Expected Nonattainment Areas



EPA Projects More than 99% of Counties would Meet the Revised Fine Particle Pollution Standard
Projection of Counties with Monitors that would not Meet in 2032
(Based on EPA Modeling of Projected 2032 Emissions)



Breaking it down



Stationary Source Permitting

- Prevention of Significant Deterioration (attainment area permitting) applies with respect to a new standard in all areas of the U.S. designated attainment for the pollutant upon the effective date of the new standard.
- Nonattainment New Source Review applies in areas designated nonattainment for the pollutant, which includes any areas newly designated nonattainment at/after the effective date of nonattainment designations.



Implications of Lower Standards

Evaluation of Exceeding Monitors

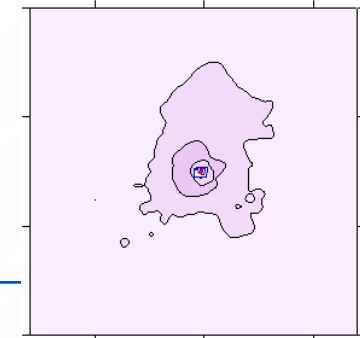
- Who is responsible?
- Culpability assessments
- Modeling may be performed
- Reductions assessed if necessary
- Plan for attainment

Much more difficult to build new facilities

- Air modeling requirement for NAAQS compliance
- High background values
- Secondary PM_{2.5}



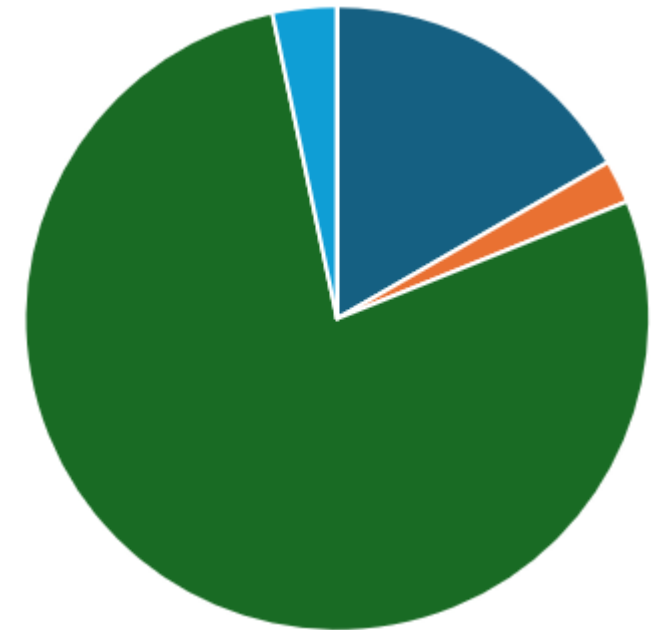
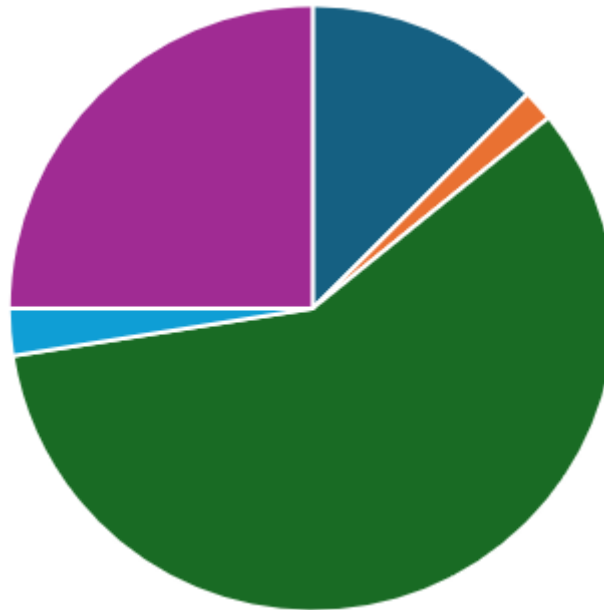
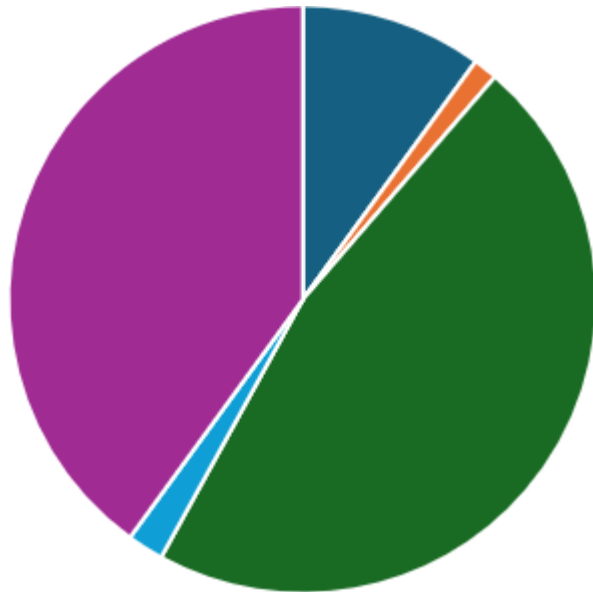
Case Study – PM_{2.5} Annual NAAQS



2010 NAAQS: 15 $\mu\text{g}/\text{m}^3$

2012 NAAQS: 12 $\mu\text{g}/\text{m}^3$

2024 NAAQS: 9 $\mu\text{g}/\text{m}^3$



- Facility primary impacts (modeled)
- Facility secondary impacts (MERPS)
- Background monitor concentration
- Neighboring sources
- Unconsumed NAAQS

Permitting Scenarios

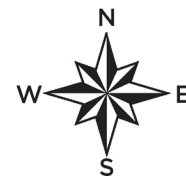
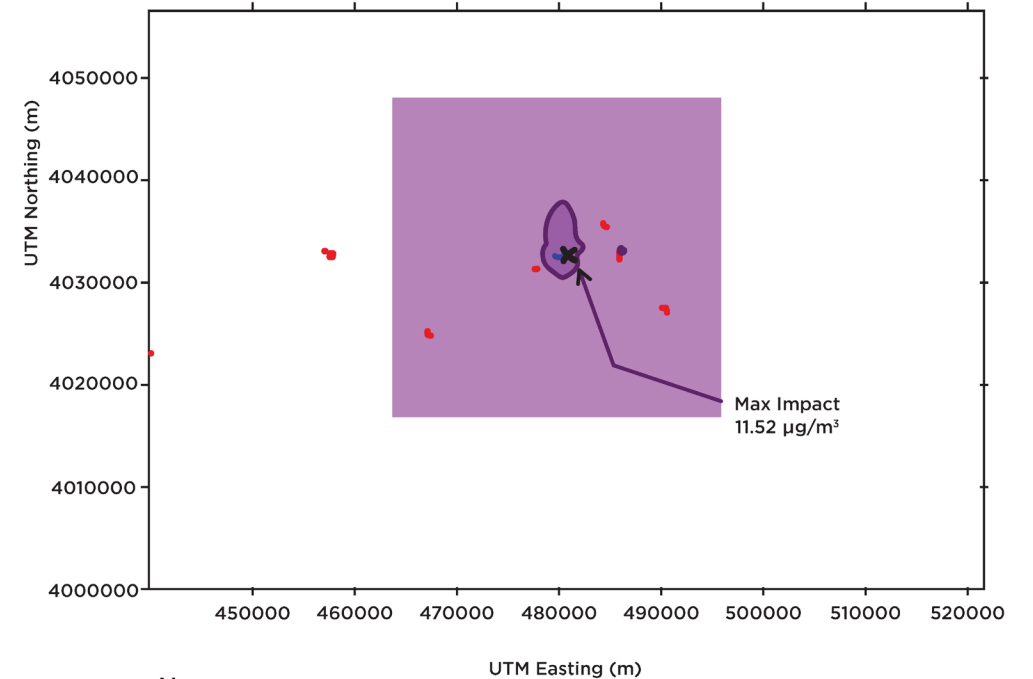
- A facility has a final permit in hand before the effective date of new standard
 - Project moves ahead, no new air permitting requirements
 - Permit issued
- A facility has a permit in process when new standard takes effect – likely to be issued by a state or local air agency
 - Update modeling results to the new standard level, evaluate if additional air pollution emissions reductions are needed
 - Meet new standard
 - Permit issued
- Plans for building new facility or expanding an existing one
 - Work with permitting agency to achieve results within the new standard
 - Demonstrate compliance with Clean Air Act requirements
 - Permit issued



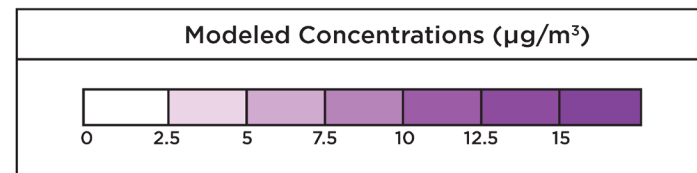
Case Study | New Project or Expansion

- PSD application at state agency
- Natural gas-fired facility
- Includes secondary PM_{2.5}
- NAAQS effective date before permit issued
- Includes haul roads
- Need to make changes to facility and resubmit

Figure 1: NAAQS PM_{2.5} Annual With Background (5 years)



+ Generating Station and Inventory Sources



Permitting Scenarios, ctd

- Plans for building new facility or expanding one in an area not meeting the new standard (**permit needed after EPA designations process is completed**)
 - If major project under the SIP, install Lowest Achievable Emission Rate controls
 - Demonstrate compliance with Clean Air Act requirements
 - Obtain offsets
 - Permit issued



Looking Ahead



What Happens Next? (Part 1)

- Reconsideration of PM_{2.5} NAAQS is one of EPA's 31 deregulatory actions was announced in March 2025
- Any attempt to revise the standard will be subject to the formal rulemaking process, including notice and comment periods
- EPA March 12, 2025 News Release

“EPA is also announcing that it will soon release guidance to increase flexibility on NAAQS implementation, reforms to New Source Review, and direction on permitting obligations. This suite of actions advances cooperative federalism and begins to undo red tape holding back American exceptionalism.”

The U.S. has some of the lowest fine particulate matter levels in the world. Between 2000 and 2023, average PM_{2.5} concentrations in the U.S. fell by 37 percent and average PM₁₀ concentrations similarly fell by 36 percent.”



What Happens Next? (Part 2)

For now:

- States make recommendations of nonattainment with new standard to EPA within 1 year of effective date
 - States have submitted recommendations (due no later than February 7, 2025)
- EPA reviews each state's recommendation and approves or disapproves
 - Final designations are made by May 6, 2026
 - States submit plan to achieve attainment

**TYPICALLY TAKES YEARS FOR
IMPLEMENTATION**



Wrap-up



Final Thoughts



If you are an industrial facility, know the PM_{2.5} levels in your area



Be aware of any potential projects at your facility and the timeframes for these new projects



Understand your facility's contribution to the PM_{2.5} levels



Keep an eye on the state's designations for your facilities or proposed projects



Watch for updates to PM_{2.5} NAAQS and EPA deregulatory actions



Questions?

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