

Preparing for the Proposed PM_{2.5} Decrease

Carly Wittman Midwest AWMA Environmental Technical Conference

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Agenda

- 1. $PM_{2.5}$ and NAAQS Basics
- 2. Proposed PM_{2.5} Changes
- 3. Impacts of NAAQS reconsideration: Looking forward
- 4. Q&A and discussion



What is PM_{2.5}?

• PM_{2.5} (or fine particles), are droplets or particles with a diameter up to 2.5 microns



• Exposure can impact lung and heart, including following:

- Premature death in those with lung and heart disease
- Nonfatal heart attacks
- Aggravated asthma
- Increased respiratory symptoms such as coughing or difficulty breathing
- Can be primary particles

 (directly emitted from emission sources) or secondary
 particles (formed by
 photochemical oxidation
 reactions).

Manmade sources

- Fuel combustion (burning coal, oil, natural gas, wood)
- Industrial processes (e.g., manufacturing, metal production)
- Mobile sources (diesel and gasoline powered vehicles)
- Natural sources
 - Wildfires
 - Sea salt
 - Dust from wind erosion
- Precursors
 - NO_x, SO_x, VOCs, & NH₃

What are the National Ambient Air Quality Standards (NAAQS)?



Mandated by the Clean Air Act (CAA), EPA sets NAAQS for six "criteria air pollutants": carbon monoxide (CO), lead (Pb), particulate matter (PM), ozone (O₃), nitrogen dioxide (NO_x) and sulfur dioxide (SO₂)



NAAQS sets Primary (human health-based) and secondary (welfare protection-based) standards. Set without consideration of cost, only to protection public health and/or welfare



CAA requires the NAAQS to be reviewed every 5 years to ensure their adequacy



Review process is very lengthy and includes multiple steps; it is only rarely completed within the 5year deadline – typically reviews take 7-10+ years

Recent PM_{2.5} review history

In June 2014, EPA began most recent review process which published in December 2020 that EPA would retain current NAAQS for $PM_{2.5}$ and PM_{10} . Several groups petitioned decision.

New administration in January 2021 issued executive order to review agency actions, including 2020 $PM_{2.5}$ NAAQS decision.

Prompted development of a supplement to 2019 Integrated Science Assessment (ISA), updated Policy Assessment, and re-esbtablished Clean Air Scientific Advisory Committee (CASAC).

The resulting 2019 ISA supplement, Policy Assessment in October 2021, and CASAC reviews suggested that retaining current NAAQS was not stringent enough to protect public health.

CURRENT PROPOSED RULE

On January 6, 2023, the USEPA announced proposal to revise the National Ambient Air Quality Standard (NAAQS) for particulate matter ($PM_{2.5}$). EPA was open to comments until March 28, 2023. Rule may be finalized later in 2023 or early 2024.

Current Proposed PM_{2.5} NAAQS (January 2023)

AVERAGING TIME	PRIMARY OR SECONDARY	CURRENT	PROPOSED	ACCEPTED COMMENTS?
PM _{2.5}				
Annual	Primary	12 µg/m³	9-10 µg/m³	8-11 µg/m³
Annual	Secondary	15 µg/m³	Retain	-
24-hour	Primary and Secondary	35 µg/m³	Retain	25 µg/m³
PM ₁₀				
24-hour	Primary and Secondary	150 µg/m³	Retain	-

Other proposed changes

Air Quality Index (AQI) Updates

AQI value	Current µg/m ³	Proposed µg/m ³
0 - 50 Good	0	0
50 - 100 Moderate	12	9-10
100 - 150 USG	35	35*
150 - 200 Unhealthy	55	55*
200 - 300 Very unhealthy	150	125
300 - 500 Hazardous	250	225

*If $PM_{2.5}$ 24-hr standard is lowered instead of retained, the 100-150 category will become 25 and the 150-200 category will proportionally lower as well.

Monitoring Network Updates

- Proposing to modify PM_{2.5} monitoring network design criteria to include an environmental justice (EJ) factor
 - EJ factor accounts for the proximity of populations at increased risk of adverse health effects from PM_{2.5} exposures.
 - Increased awareness of at-risk communities near sources of concern, such as ports, rail yards, airports, industrial areas or major roadways, may be needed.
- Expand monitor network to include more monitors in highly populated areas (Metropopulation Statistical Areas (MSA) with >1M people)

Impacts of NAAQS reconsideration

Looking forward

New Nonattainment areas

PM-2.5 Nonattainment Areas (2012 Standard)



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.

https://www3.epa.gov/airquality/greenbook/mappm25_2012.html



https://www.epa.gov/pm-pollution/proposed-decision-reconsideration-national-ambient-air-quality-standards-particulate

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Requirements prompted by proposed rule:

States Review Nonattainment	Resulting SIP Changes, if	Permitting Programs Impacted
Designations	needed	(NNSR and PSD)
 Currently, only 20 counties are currently non-attaining for annual PM_{2.5} NAAQS Proposed rule suggests 50+ counties will exceed standard 	 To come back into attainment, the states will have to update their State Implementation plans with control strategies Could impact existing sources 	 New nonattainment areas Increased agency review times Modeling challenges Could impact planned projects

Looking Forward: Effects on Permitting

Nonattainment New Source Review (NNSR)

Sources located inside nonattainment area

- New Major Source: 100/70 TPY $\rm PM_{2.5},\ 100/70$ TPY of any individual $\rm PM_{2.5}$ precursor
- Major modification: SERs are 10 tpy $PM_{2.5 \&}$ 40 tpy SO₂, NO_X, or VOC
- Historically, minor sources could be subject to Title V
- Other Nonattainment New Source Review that could be costly:
 - Lowest Achievable Emissions Rate (LAER)
 - Purchase emission offsets
 - Alternative site analysis
 - Public review interest
- Permit issuance could take longer due to more review burden on agencies
- Reasonably Available Control Technology (RACT) analysis for existing sources



Looking Forward: Effects on Permitting

Prevention of significant deterioration (PSD)

Sources located outside of NAA

- Modeling more difficult to demonstrate compliance with NAAQS
- Difference between monitored background and NAAQS very tight
 - \bullet Most monitored counties are on average 7.8 $\mu g/m^3$
- Additional controls or operational conditions
- Similar recommendations for states with minor source permitting/modeling requirements



Proactive Steps to Prepare:

Assess current air quality

- a. What is the current design value in your area?
- b. What is the $PM_{2.5}$ trend in the area?

What will industry need to do

- a. Plan ahead for upcoming projects understand emissions levels of $PM_{2.5}$ and precursors
- b. Be prepared for what SIPs may require to address air quality concerns emissions controls, more monitoring, etc.

Expect EPA will perform more monitoring

- a. Identify "hot spots" for poor air quality
- b. Fenceline monitoring is being used to ensure projects/facilities are in compliance with NAAQS

What's next?



Bright ideas. Sustainable change.



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