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Council of Industrial Boiler Owners: NAAQS Update

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OVERVIEW

- NAAQS Program
- Existing NAAQS
- NAAQS Reviews
- Implementation Issues

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PRIMARY NAAQS

- Primary National Ambient Air Quality Standards (NAAQS) are standards "the attainment and maintenance of which in the judgment of the Administrator, based on . . . criteria [reflecting the latest scientific information on the health and environmental effects of the regulated pollutant] and allowing an adequate margin of safety, are requisite to protect the public health."
  - Clean Air Act ("CAA") § 109(b)(1)

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SECONDARY NAAQS

- Secondary NAAQS "specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator, based on . . . criteria [reflecting the latest scientific information on the health and environmental effects of the regulated pollutant], is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air."
  - CAA § 109(b)(2)

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DESIGNATIONS/CLASSIFICATIONS

- Areas are generally to be designated "attainment," "nonattainment," or "unclassifiable" within 2 (or 3) years of a new NAAQS
  - Special provisions applied to several pollutants at the time of the 1990 Clean Air Act Amendments
  - CAA § 107
- EPA may classify areas at the time of designation; in some cases classification occurs as a matter of law
  - CAA §§ 172(a)(1), 181(b), 186(b), 188(a)

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STATE IMPLEMENTATION PLANS

- Infrastructure Plans - CAA § 110(a)
  - Due not more than 3 years after new NAAQS
  - EPA says states must have in place "basic air quality management program components"
- Nonattainment Area Schedules – CAA § 172(a) & (b)
  - Primary NAAQS
    - Generally submitted within 3 years of designation
    - Provide for attainment "as expeditiously as practicable" but not later than 5-years after designation
    - Extensions are possible
  - Secondary NAAQS
    - Same general submissions schedule
    - Attainment "as expeditiously as practicable"

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NONATTAINMENT PLAN CONTENT

- Generally – CAA § 172(c)
  - All reasonably available control measures (including reasonably available control technology)
  - Reasonable further progress
- Ozone – CAA Subpart 2 (§§ 181-185B)
- Carbon monoxide – CAA Subpart 3 (§§ 186-187)
- Particulate matter – CAA Subpart 4 (§§ 188-190)
- Sulfur oxides, nitrogen dioxide and lead – CAA Subpart 5 (§§ 191-192)

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NEW SOURCE REVIEW

- Required for new or modified major stationary sources once a NAAQS is promulgated
- In attainment or unclassifiable areas (CAA §§ 160-169)
  - Best available control technology
  - Will not cause or contribute to a NAAQS or increment violation
- In nonattainment areas (CAA § 173)
  - Definition of “major source” differs by pollutant
  - Lowest achievable emission rate
  - Emission offsets in ratios that vary by pollutant

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NAAQS POLLUTANTS

- Set for six listed "criteria" air pollutants that occur in ambient air as a result of emissions from "numerous and diverse" "mobile or stationary sources
  - Particulate matter (PM)
  - Sulfur oxides (SO_2)
  - Nitrogen oxides (NO_2)
  - Ozone (O_3)
  - Carbon monoxide (CO)
  - Lead (Pb)

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WILD CARDS

- EPA has been asked to list additional criteria pollutants, including:
  - Greenhouse gases
  - CO_2
  - Ammonia
  - Hydrogen sulfide

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CURRENT NAAQS

POLLUTANT	STANDARD	TYPE	CITATION
SO_2	0.030 ppm, annual arithmetic mean 0.14 ppm, 24-hour average 0.5 ppm, 3-hour average 75 ppb, 1-hour average, 99th percentile	P P S P	40 CFR 50.4(a) 40 CFR 50.4(b) 40 CFR 50.5(a) 40 CFR 50.17(a)&(b)
PM	150 µg/m^3 PM_{10}, 24-hour average 15 µg/m^3 $PM_{2.5,}$ annual arithmetic mean 65 µg/m^3 $PM_{2.5}$, 98th %, 24-hour average 35 µg/m^3 $PM_{2.5}$, 98th %, 24-hour average 12 µg/m^3 $PM_{2.5}$, annual arithmetic mean	P&S P&S P&S P&S P	40 CFR 50.6(a) 40 CFR 50.7(a), 50.13(a) 40 CFR 50.7(a) 40 CFR 50.13(a); 50.18(a) 40 CFR 50.18(a)
CO	9 ppm 8-hour average 35 ppm, 1-hour average	P P	40 CFR 50.8(a)(1) 40 CFR 50.8(a)(2)
O_3	0.12 ppm, 1-hour average 0.08 ppm, 8-hour average 0.075 ppm, 8-hour average	P&S P&S P&S	40 CFR 50.9(a) 40 CFR 50.10(a) 40 CFR 50.15(a)
NO_2	53 ppb, annual arithmetic mean 100 ppb, 98th %, 1-hour average	P&S P	40CFR 50.11(a), (c) 40 CFR 50.11(b), (f)
Pb	1.5 µg/m^3, calendar quarter 0.15 µg/m^3 3-month arithmetic mean	P&S P&S	40 CFR 50.12(a) 40 CFR 50.16(a)

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NAAQS REVIEW SCHEDULE

	Ozone	Lead	Primary NO_2	Primary SO_2	Secondary NO_2 and SO_2	PM	CO
Last Review Completed (final rule signed)	Mar 2008	Oct 2008	Jan 2010	Jun 2010	Mar 2012	Dec 2012	Aug 2011
Recent or Upcoming Major Milestone(s)[1]	Feb 2014 2nd Draft REAs 2nd Draft PA Mar 25-27, 2014 CASAC review meeting Proposed rule Dec. 1, 2014 Final rule Oct. 1, 2015	Mar/Apr 2014 Final PA 2014 Proposed rule Dec. 2014 Final rule Nov. 2015	Nov 2013 1st Draft ISA Feb 2014 Draft IRP Mar 12-13, 2014 CASAC review meeting Proposal Nov. 2016 Final Aug. 2017	Mar 19, 2014 Draft IRP released Apr 22, 2014 CASAC review meeting Proposal May 2017 Final Rule Feb. 2018	Mar 4-6, 2014 Kickoff workshop for next review Summer 2014 Draft IRP	Kickoff workshop for next review targeted for early 2015	Kickoff workshop for next review targeted for 2015

From EPA (4/2014), with my updates in red

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OZONE NAAQS REVIEW

- EPA staff recommendations on primary standard:
  - Health effects at current standard "can reasonably be judged important from a public health perspective"
  - Recommend retaining the indicator, averaging time and form of the standard
  - Staff recommend a level in the range of 60-70 ppb
    - 70 ppb is "just below" the level at which the combined occurrence of respiratory symptoms and lung function decrements have been reported.
    - 65 ppb is "well below" exposures reported to elicit a "wide range of potentially adverse respiratory effects"
    - 60 ppb is "well below" the concentration at which respiratory symptoms and lung function decrements have both been seen and "corresponds to the lowest exposure concentration demonstrated to result in lung function decrements and pulmonary inflammation"

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OZONE NAAQS REVIEW

- Recommendations of the Clean Air Scientific Advisory Committee (CASAC) on the primary standard:
  - "[T]here is clear scientific support for the need to revise the standard."
  - Concurs with the recommendation to retain the current indicator, averaging time, and form
  - "[T]here is adequate scientific evidence to recommend a range of levels for a revised primary ozone standard from 70 to 60 ppb."
    - A standard of 70 ppb "may not meet the statutory requirement to protect public health with an adequate margin of safety."
    - Recommend a level "lower than 70 ppb within a range down to 60 ppb" to "provide incrementally greater margins of safety."

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OZONE NAAQS REVIEW

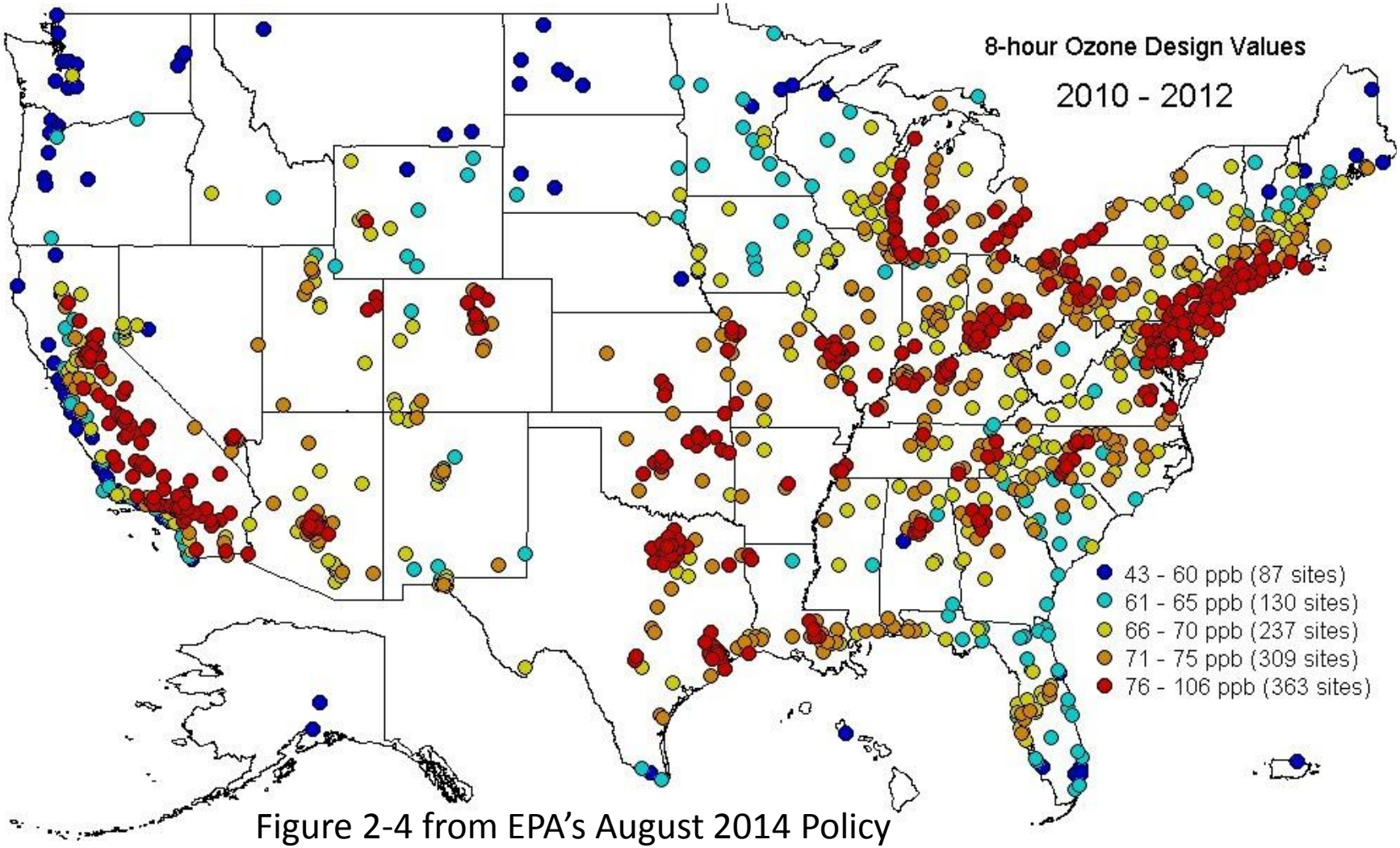

Figure 2-4 from EPA's August 2014 Policy Assessment

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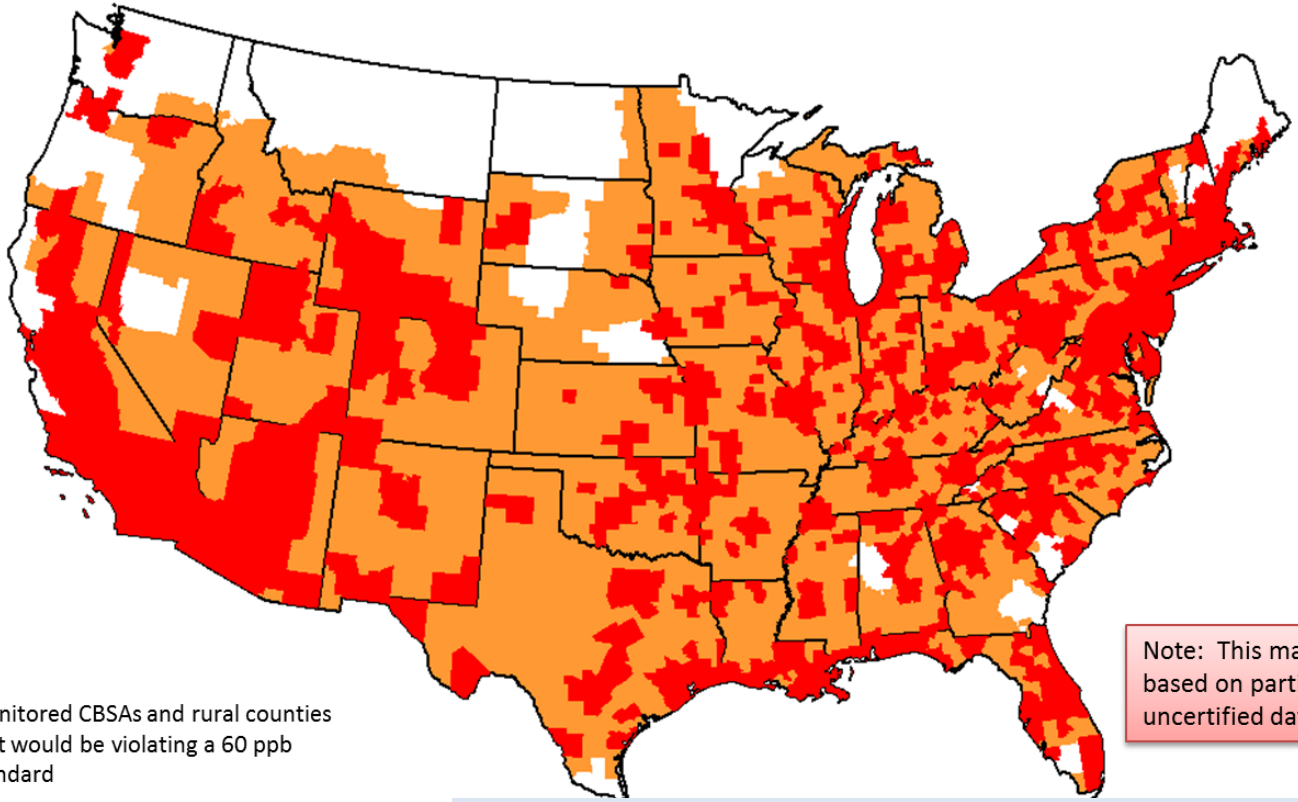
OZONE NAAQS REVIEW

Monitored Areas Exceeding 60 PPB And Un-Monitored Areas Estimated To Exceed 60 PPB Based on Spatial Interpolation



Monitored CBSAs and rural counties that would be violating a 60 ppb standard

Unmonitored areas that have estimated ozone levels that would be violating a 60 ppb standard (based on spatial interpolation)

Note: This map is based on partially uncertified data

Available at http://www.nam.org/Special/Media-Campaign/EPA-Overregulation/Ozone-Regulations.aspx?utm_source=nam&utm_medium=alias&utm_campaign=ozone

Based on 2011-2013 data accessed from http://www.epa.gov/airtrends/ and http://www.epa.gov/airdata/ on 6/2/2014

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OZONE NAAQS REVIEW

- EPA staff recommendations on secondary standard:
  - Welfare effects estimated to be allowed by the present standard "call into question" the public welfare protection it provides
  - It is more appropriate to use "a more biologically relevant form, such as the cumulative, seasonal W126 metric"
    - Cumulate daily exposures between 8:00 am and 8:00 pm
    - Cumulate weighted values over "the consecutive 3-month period within the O_3 season with the maximum index value"
    - Use an annual or 3-year form
    - Level within the range of 17 to 7 ppm-hrs

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OZONE NAAQS REVIEW

- CASAC recommendations on the secondary standard:
  - "[T]he current secondary standard is not adequate to protect against current and anticipated welfare effects of ozone on vegetation"
  - Revise the form of the secondary standard to "the biologically-relevant W126 index accumulated over a 12-hour period (8 a.m.-8 p.m.) over the 3-month summation period of a single year"
  - Within the range of 7 to 15 ppm-hrs
    - Do not support a level higher that 15 ppm-hrs
    - Do not recommend use of a 3-year average, but if one is used, the standard should not exceed 13 ppm-hrs

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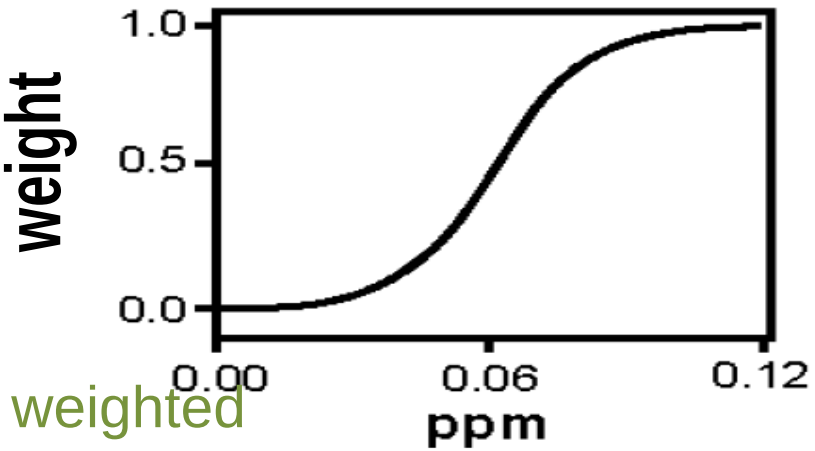
OZONE NAAQS REVIEW

- What is the W126 indicator?

$$W126 = \sum_{i=8AM}^{i<7PM} w_{C_i} C_i, \text{ where } C_i = \text{hourly } O_3 \text{ at hour i, and } w_{C_i} = \frac{1}{1+4403e^{-126C_i}}.$$

- How is W126 determined?
- Assign a weight to each hourly value from 8 a.m. to 8 p.m. based on concentration



  - For each day, sum the 12 weighted hourly values to calculate a daily W126
  - Sum monthly values to calculate a monthly W126
  - Identify the consecutive 3-month period for which the monthly values sum to the highest total
  - The is the W126 value for the site for the year

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OZONE NAAQS REVIEW

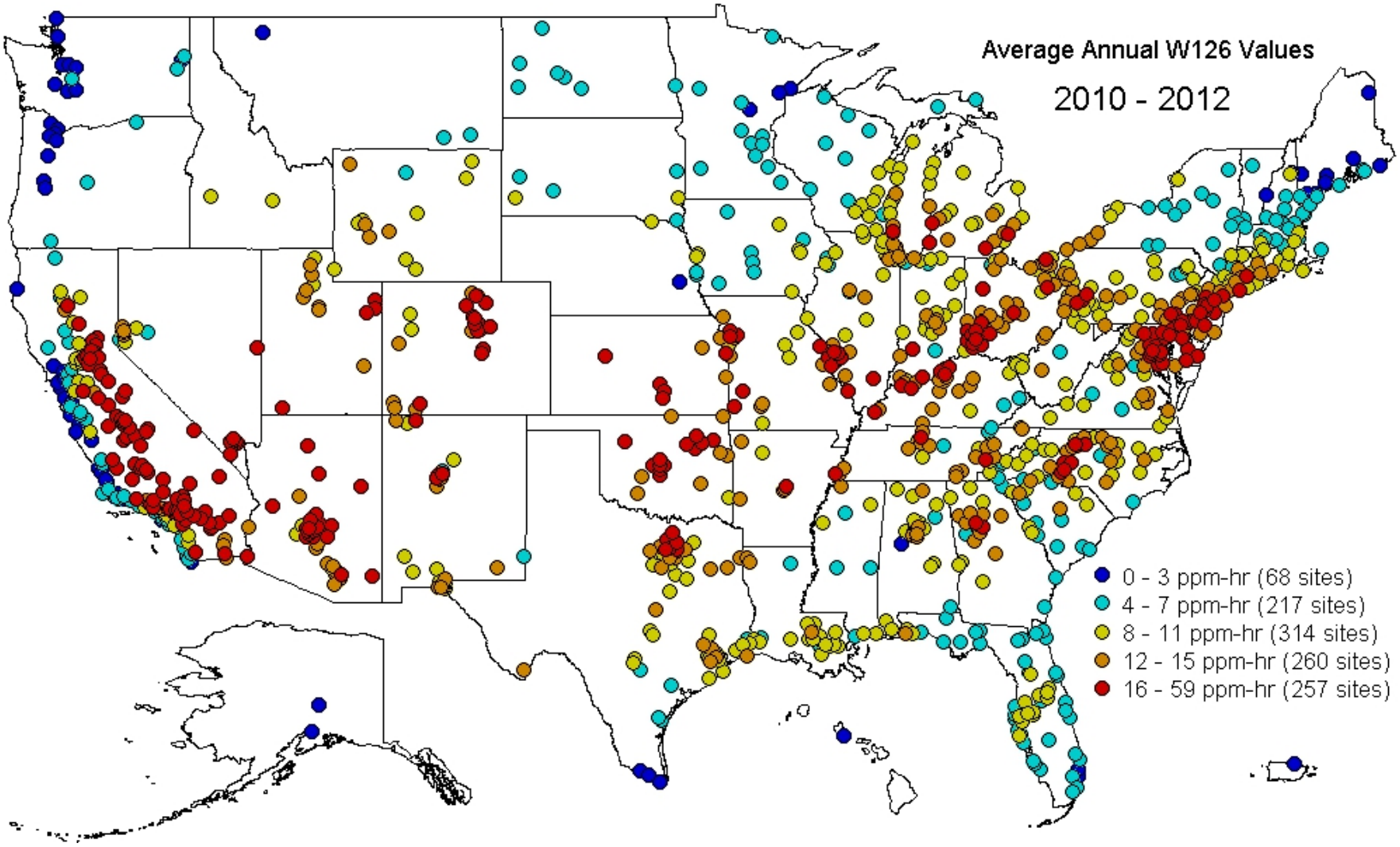

Figure 2-6 from EPA's August 2014 Policy Assessment

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NAAQS IMPLEMENTATION

EPA Timeline (April 2014):

Pollutant	Final NAAQS Date	Infrastructure SIP Due	Designations Effective	Attainment Plans Due	Attainment Date
$PM_{2.5}$ (2006)	Oct 2006	Oct 2009	Dec 2009	Dec 2014	Dec 2015 (Mod) Dec 2019 (Ser)
Pb (2008)	Oct 2008	Oct 2011	Dec 2010/2011	June 2012/2013	Dec 2015/2016
NO_2 (2010) (primary)	Jan 2010	Jan 2013	Feb 2012	N/A	N/A
SO_2 (2010) (primary)	June 2010	June 2013	Oct 2013 ** (+2 rounds)	April 2015	Oct 2018
Ozone (2008)	Mar 2008	Mar 2011	July 2012	Mid 2015/2016	2015/2032
$PM_{2.5}$ (2012)	Dec 2012	Dec 2015	Early 2015	Mid 2016	Dec 2021 (Mod) Dec 2025 (Ser)

**There is ongoing litigation over the SO_2 designation dates.

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SO_2 NAAQS IMPLEMENTATION

- Designations
  - EPA originally planned to use air quality modeling to make designations for the 1-hour NAAQS by June 2012; later announced it would take another year
    - EPA indicated that monitoring alone would not generally be sufficient for an attainment designation
    - States and industries argued against that use of modeling
    - EPA held workshops with stakeholders and issued white papers considering what air quality monitoring or, in the alternative, modeling would be used for designations

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SO_2 NAAQS IMPLEMENTATION

- Concerns with use of modeling for designations:
  - Would deviate from prior practice and had not been the subject of notice and comment rulemaking
  - EPA's preferred AERMOD model and modeling practices set forth in it Modeling Guideline and other guidance lead to unrealistically high predictions of ambient SO_2
    - Assumptions about continuous operations at permitted limits
    - Application of the stack height rules limiting credit for actual stack heights
    - Model performance at low wind speeds leading to overprediction

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SO_2 NAAQS IMPLEMENTATION

- SO_2 Designations Rule
  - On Aug. 5, 2013, EPA designated 29 nonattainment areas with monitored violations but took no action on designations for the rest of the country
  - Petitions for review were filed by Sierra Club and NRDC, U.S. Steel, Treasure States Resource Industry Association, and AmerenEnergy Resources Generating Co.
    - All the petitions have been consolidated
    - Three petitions for reconsideration were also filed
    - Several industry groups and states intervened
  - Case has been in abeyance; motions to govern further proceedings are due Sept. 15, 2014

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SO_2 NAAQS IMPLEMENTATION

- SO_2 Designations Deadline Cases
  - 8/26/13 – Sierra Club and NRDC in the Northern District of California
    - Several states were granted intervention
    - Court found liability based on an EPA concession
    - Settlement between EPA and the plaintiffs was lodged on May 19, 2014
    - Intervenor states did not join
  - 9/12/13 – North Dakota, South Dakota, Nevada and Texas in the District of North Dakota
    - Being held in abeyance
  - 10/9/13 – North Carolina in the Eastern District of North Carolina
    - Being held in abeyance

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SO_2 NAAQS IMPLEMENTATION

- Consent decree terms
  - Three phases of designations
  - Phase 1: Within 16 months of decree entry for sources within the Air Markets Database that had not been "announced for retirement" by the date the decree is entered and that either emitted more than 16,000 tons of SO_2 in 2012 or that emitted more than 2600 tons of SO_2 that year and had an annual average emission rate of 0.45 lbs/Mmbtu
    - "Announced for retirement" applies to a coal-fired unit with a capacity over 5 MW as of Jan. 1, 2010 that has announced it "will cease burning coal at that unit"
    - Anticipate that likely deadline for these designations will be around Jan./Feb. 2016

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SO_2 NAAQS IMPLEMENTATION

- Consent decree terms, continued
  - Phase 2: By December 31, 2017 for "any remaining undesignated areas" in states that have not "installed and begun operating a new SO_2 monitoring network meeting EPA specifications referenced in EPA's anticipated rulemaking directing states to collect and analyze information regarding SO_2 emission concentrations" by January 1, 2017
  - Phase 3: By December 31, 2020, for all remaining undesignated areas.

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SO_2 NAAQS IMPLEMENTATION

- Consent decree status
  - Comments were due by July 2, 2014
    - State comments uniformly opposed entry of the consent decree
    - Many industry comments also opposed it
  - Aug. 29, 2014, EPA, Sierra Club, and NRDC file a motion to enter the consent decree
    - Indicated that comments did not require changes
    - All state intervenors opposed the motion
    - Fourteen states also filed an amicus brief opposing the motion
  - Hearing on the motion scheduled for Oct. 17, 2014

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SO_2 NAAQS IMPLEMENTATION

- Proposed Data Requirements Rule
  - In Federal Register on May 13, 2014
  - Comments were due July 14, 2014
  - EPA anticipates a final rule in September 2015
  - Designations would occur in two phases
    - December 31, 2017 – for the majority of the country, assuming most areas will rely on modeling
    - December 31, 2020 – for the remainder of the country, i.e., for areas that states that have operational relocated and/or installed new monitors adequate to characterize peak 1-hour SO_2 concentrations by January 1, 2017

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SO_2 NAAQS IMPLEMENTATION

- EPA is taking comment on the use of modeling for these designations
  - EPA argues in the rule that the use of modeling for initial designations is a long-standing practice
  - EPA will not require modeling for SO_2 designations to comply with the Modeling Guideline
    - Will use actual emissions, not allowable
    - Will use actual stack heights, not GEP
  - EPA is taking steps to improve the AERMOD model, but the use of modeling for designations remains a concern
    - Improvements to the handling of low wind speed conditions
    - Not a part of the default regulatory version of the model

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SO_2 NAAQS IMPLEMENTATION

- Sources to be addressed will be determined by annual emissions rates in urban and non-urban areas

Option	Threshold For SO_2 Sources		Number of Sources**	Percent of National Emissions†	Plus Sources In Designated Nonattainment Areas‡	Total Source Coverage	Total Annual Emissions Coverage
	Inside CBSAs Greater than 1M	Outside CBSAs Greater than 1M					
1*	1,000 TPY	2,000 TPY	447	75 %	47	496	90 %
2	2,000 TPY	5,000 TPY	271	66 %	47	323	82 %
3	3,000 TPY	10,000 TPY	159	54 %	47	211	69 %

* Preferred option.
** These do not include sources located in nonattainment areas designated in 2013.
† Total SO_2 emissions in 2011 were 5.8 million tons.
‡ There are 47 sources with annual emissions greater than 1,000 tpy in nonattainment areas designated in 2013.

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SO_2 NAAQS IMPLEMENTATION

- Areas designated unclassifiable/attainment would be required to verify that status periodically
- If based on monitoring, would have to continue monitoring unless --
  - The 3-year design value at the monitor is less than 50% of the standard, or
  - The 3-year design value at the monitor is less than 80% of the standard
  - In either case, would also have to assess emission changes annually

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SO_2 NAAQS IMPLEMENTATION

- Comment was sought on three options for verification of status for areas that were modeled as attainment
  - Assess actual emissions annually and remodel every 3 years
  - Assess actual emissions annually; if they increase, assess whether new modeling is needed
  - Conduct screening modeling every 3 years, followed by full-scale modeling if the screening model suggests a problem

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SO_2 NAAQS IMPLEMENTATION

- Infrastructure SIPs
  - Were due June 2013
  - Traditional requirements/no modeling
- Nonattainment SIPs for areas designated in Aug. 2013
  - Are due April 2015
  - Must provide for attainment by October 2018
  - Guidance on these SIPs was issued April 23, 2014
    - Traditional modeling requirements
    - Sources must comply with attainment strategy at least 1 year before the attainment date
    - Presumptive 1-hour emission limit, but may be longer if "designed to have comparable stringency to a 1-hour average limit at the critical emission value"

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$PM_{2.5}$ IMPLEMENTATION

- In Jan. 2013, the D.C. Circuit held that $PM_{2.5}$ NAAQS are subject Subpart 4's nonattainment implementation requirements for PM
  - Has implications for the 1997, 2006, and 2013 $PM_{2.5}$ NAAQS
  - EPA promulgated a rule on June 6, 2014 that classified all nonattainment areas for the 1997 and 2006 $PM_{2.5}$ NAAQS as "moderate"
    - Missing SIP requirements due by Dec. 31, 2014
    - Several environmental groups have petitioned for review
  - Other requirements of Subpart 4 will be addressed in an implementation rule for the 2013 NAAQS
    - Scheduled for proposal this fall

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$PM_{2.5}$ IMPLEMENTATION

- Designations for the 2013 NAAQS
  - EPA provided notice of its responses to state designations on Aug. 29, 2014
  - Comments on those responses are due by Sept. 29, 2014
  - EPA intends to finalize those designations by Dec. 31, 2014
- Permitting
  - A continuing problems since EPA ended the PM_{10} surrogacy policy
  - Guidance issued May 20, 2014 leaves open the possibility that photochemical grid modeling will be necessary

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OZONE IMPLEMENTATION

- Designations for the 2008 NAAQS were finalized in 2012
  - NRDC challenged attainment date and transportation conformity provisions of an associated rule
    - Case has been argued; awaiting decision
  - Sierra Club's petition for redesignation of several areas to nonattainment was denied Aug. 14, 2014
    - Petition for review likely by Nov. 4, 2014
- Several citizen suits have been filed or noticed on infrastructure SIPs
- Final implementation rules for the 1997 & 2008 NAAQS are scheduled for promulgation this year

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NO_2 IMPLEMENTATION

- The entire country was designated "unclassifiable/attainment" for the 2010 NAAQS in Feb. 2012
- The new near-road monitoring network is starting to report data
- Permitting and associated modeling continue to pose significant problems
  - Well illustrated by the recent Ninth Circuit decision vacating a permit issued to the Avenal Energy Project
  - Proposed model improvements have been developed, largely by industry, but are not default regulatory options

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QUESTIONS?