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SO₂ NAAQS Update - Data Requirements Rule and Related Dispersion Modeling/Monitoring Guidance

PM_{2.5} NAAQS Update - Finalized SIP Requirements Rule and PM_{2.5} Modeling Guidance

Brief Ozone NAAQS Update - Current and Proposed

Proposed Data Requirements Rule for 1-Hour SO₂ NAAQS



FEDERAL REGISTER

Vol. 79 Tuesday,
No. 92 May 13, 2014

Part IV

Environmental Protection Agency

40 CFR Part 51
Data Requirements Rule for the 1-Hour Sulfur Dioxide (SO₂) Primary
National Ambient Air Quality Standard (NAAQS); Proposed Rule

- > Rule was proposed by EPA on April 17, 2014
- > Formally released in the Federal Register on May 13, 2014
- > Goal: to assist states in implementing the 1-hour SO₂ NAAQS

<http://www.gpo.gov/fdsys/pkg/FR-2014-05-13/pdf/2014-09458.pdf>

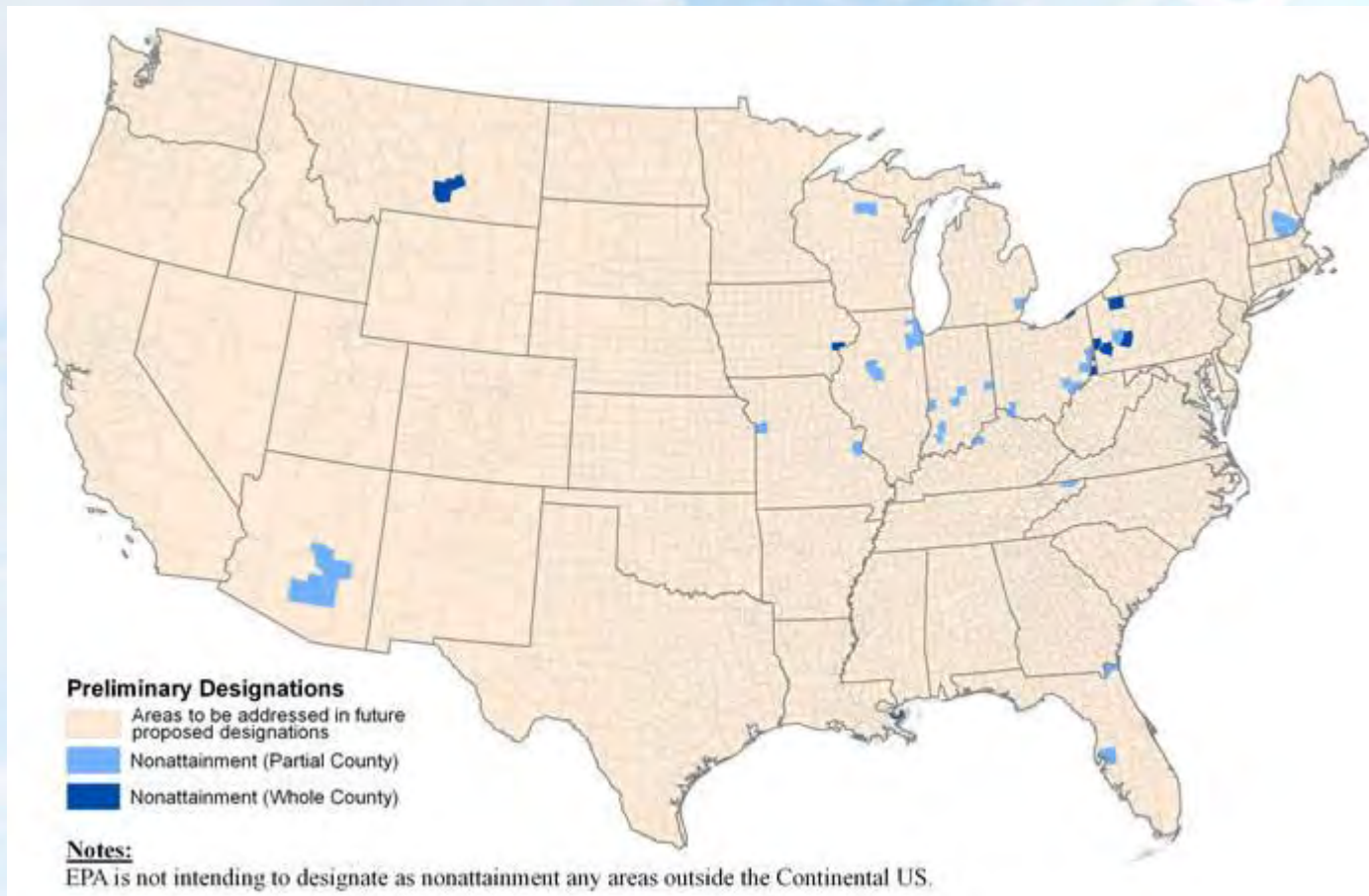
Background of the Proposed Rule

- > CAA requires EPA to issue attainment and nonattainment designations after a new NAAQS is set
- > 6/2/2010 - 1-hour SO₂ NAAQS was set
- > 9/21/2011 - EPA sought public comment on draft guidance for implementing the NAAQS
- > May-June 2012 - EPA held stakeholder meetings

Background of the Proposed Rule (continued)

- > 2/2013 - EPA developed an implementation strategy requiring states to further characterize air quality near large sources of SO₂
- > 8/5/2013 - EPA designated 29 areas in 16 states as nonattainment; all based on certified monitoring; areas must develop SIPs
- > 1/2014 - EPA released two draft Technical Assistance Documents (TADs), one for modeling and one for monitoring
- > 4/23/2014 - EPA released a SO₂ SIP planning guidance document - SIPs due for the initial 29 SO₂ NA areas - April 4, 2015

Initial SO₂ NA Designations



Focus of the Proposed Rule

- > Allow characterization of non-designated areas for future strategic implementation of the 1-hour SO₂ NAAQS
- > Focus on two types of areas:
 - ❖ Areas with large sources of SO₂ emissions
 - ❖ Areas with smaller SO₂ sources but larger populations

Focus on Specific SO₂ Sources

- > SO₂ is noted by EPA to be a “source-oriented” criteria pollutant that is relatively stable in the atmosphere in the first few kilometers and can, therefore, focus on specific sources causing specific noncompliant air quality
 - ❖ dispersion modeling can be used to discern culpable sources
 - ❖ Ambient monitoring can be used to measure source impacts
- > Some criteria pollutants such as ozone and PM_{2.5} have regional scale attributes and chemical reactivity footprints and do not fit the same kind of air quality assessment techniques as SO₂

EPA's Goal

- > Restating the goal: to assist states in implementing the 1-hour SO₂ NAAQS
- > Characterization can be done either with modeling of actual emissions or monitoring
- > Areas selected for focus will be those with large SO₂ sources or high population areas with smaller sources (to increase public health protection)

Proposed Rule Options

- > EPA has proposed three (3) options to discern the emission “thresholds” to identify sources for air agencies
- > These options are at different levels of emissions and population

III. Source Coverage and Emission Threshold Options

A. Background

This section discusses the proposed “threshold” options for identifying source areas for future air quality characterization and the factors that the EPA considered in developing them. The EPA believes the key objective to be achieved by using SO₂ source emission thresholds would be to focus the limited available resources at the local, state and federal levels toward characterizing air quality in areas having the largest SO₂ emitting sources (and greater potential for relatively higher SO₂ concentrations) but may be lacking sufficient air quality data. In proposing

Proposed Rule Options

TABLE 1—SUMMARY OF SOURCE THRESHOLD OPTIONS ^a

Option	Threshold for sources		Number of sources ^{**}	Percent of national emissions [†] (%)	Plus sources in 2013 desig. nonatt. areas [‡]	Total source coverage	Total emissions coverage (%)
	Inside CBSAs greater than 1M	Outside CBSAs greater than 1M					
1*	1,000 TPY	2,000 TPY	443	75	53	496	90
2	2,000 TPY	5,000 TPY	270	66	53	323	82
3	3,000 TPY	10,000 TPY	158	54	53	211	69

^aThe emissions in this table are based on the 2011 National Emissions Inventory (NEI) and differ from the information in the February 2013 Strategy Paper, which was based on the 2008 NEI and preliminary 2011 data. These numbers are also based on the 2013 CBSA definitions.

* Preferred option.

** These do not include sources located in nonattainment areas designated in 2013.

[†] Total SO₂ emissions in 2011 were 5.8 million tons.

[‡] There are 53 sources with annual emissions greater than 1,000 tpy in nonattainment areas designated in 2013.

Proposed Rule Options

TABLE 1—SUMMARY OF SOURCE

	Threshold for sources	
1*	Inside CBSAs greater than 1M	Outside CBSAs greater than
2	1,000 TPY	2,000 TPY
3	2,000 TPY	3,000 TPY
	3,000 TPY	5,000 TPY

^aThe emissions in this Strategy Paper, which
^{*}Preferred option
^{**}These do
[†]Total SO₂
[‡]There are 50

Take a ways of the proposed options:

- Option 1 is EPA preferred because it selects the greatest number of sources and areas for maximum protection
- Option 1 fits into EPA's 90% threshold concept in picking up 90% of the national SO₂ 2011 emissions inventory
- Option 1 is consistent with the monitoring coverage for the lead (Pb) NAAQS (which is designed to cover source-oriented emissions impacts
- Other options less stringent

Who is Affected?

- > Theoretically, states are required to do all the modeling and monitoring work
- > In reality, any source on the final list will be affected because it will either be modeled or monitored
- > Sources include coal-fired power plants, refineries, smelters, pulp & paper, chemical, and large industrial boilers

EPA Requests Specific Comments by July 14, 2014

- > Section II.B.3 states that EPA wants comments on the following:
 1. The emission threshold values
 2. The one million population threshold
 3. Suggestions on alternatives and how to use
 4. The scope of the sources covered
 5. Rationales for positions taken
 6. Confirmation of source modifications and shut downs and affect on overall totals

SO₂ Data Requirements and Implementation Timeline

- To Jan 15, 2016: Air Agency to supply a list of sources to model/monitored
- Jan 15, 2016: Modeling protocols due for sources to be modeled
- July 2016: Annual Monitoring Network Plans due to the EPA RA
- Jan 1, 2017: SO₂ monitors should be operational
- Jan 13, 2017: Modeling studies should be submitted to RAs
- Aug 2017:** States notified of intended designations
- Dec 2017: **Final designation date**
- Aug 2019: Due date for SIPs for 2017 model-based designations
- May 2020: Certification of 2019 monitoring data
- Aug 2020: States notified of intended designations
- Dec 2020: Finalize all other designations
- Aug 2022: Due date for SIPs for 2020 designations

Technical Considerations

- > Three options to provide necessary air quality information to EPA
 1. Dispersion modeling
 2. Ambient air quality monitoring
 3. Modeling and monitoring
- > Both modeling and monitoring will be source-specific, i.e., will take place “around” the identified source
- > For multiple source areas, a common approach (either modeling or monitoring) is recommended, do not use both modeling for some and monitoring for others

Technical Considerations (cont)

- > EPA has offered two TADs, one for modeling and one for monitoring
- > Monitoring TAD offers guidance on different approaches for siting source-oriented monitors
- > Modeling TAD offers guidance on models, receptors, source consideration, terrain, meteorology, background concentrations

Technical Considerations (cont)

- > From Section V of the draft rule:

Modeling is generally a less costly and less resource intensive option for providing reliable information for use in designations. In addition, refined dispersion models are able to characterize SO₂ air quality impacts from the modeled sources across the domain of interest on an hourly basis with a high degree of spatial resolution.

- > Even though states have option to monitor or model, this quote sounds like a recommendation to use modeling

Technical Considerations - Modeling

> Modeling TAD

- ❖ Focus on 1-hour SO₂ concentrations
- ❖ Consider source info:
 - ◆ Actual Emissions - CEMs
 - ◆ Stack heights
 - ◆ Stack temperature
 - ◆ Permit limits
 - ◆ Controls

Technical Considerations - Monitoring

> Monitoring TAD

❖ Consider other info:

- ◆ Nearby sources
- ◆ Ambient monitoring
- ◆ Other modeling studies
- ◆ PSD permits
- ◆ Meteorological data
- ◆ Geographical data
- ◆ Weight of evidence from combination
- ◆ Exploratory monitoring

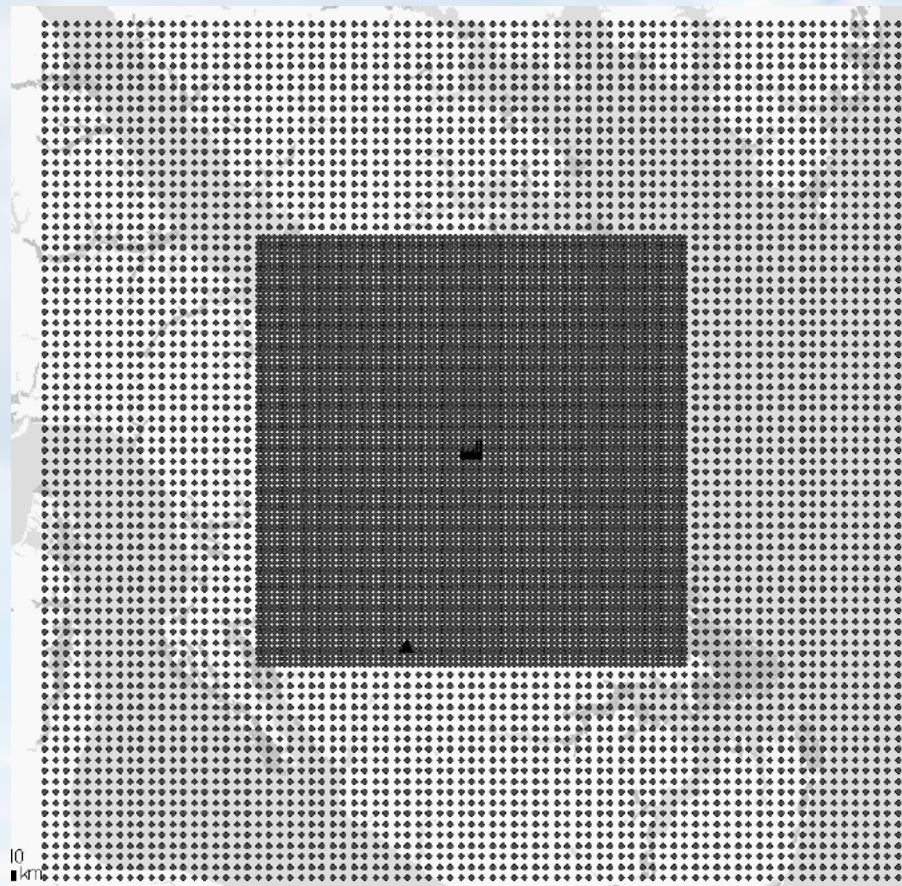
Technical Considerations - Monitoring

> Other considerations

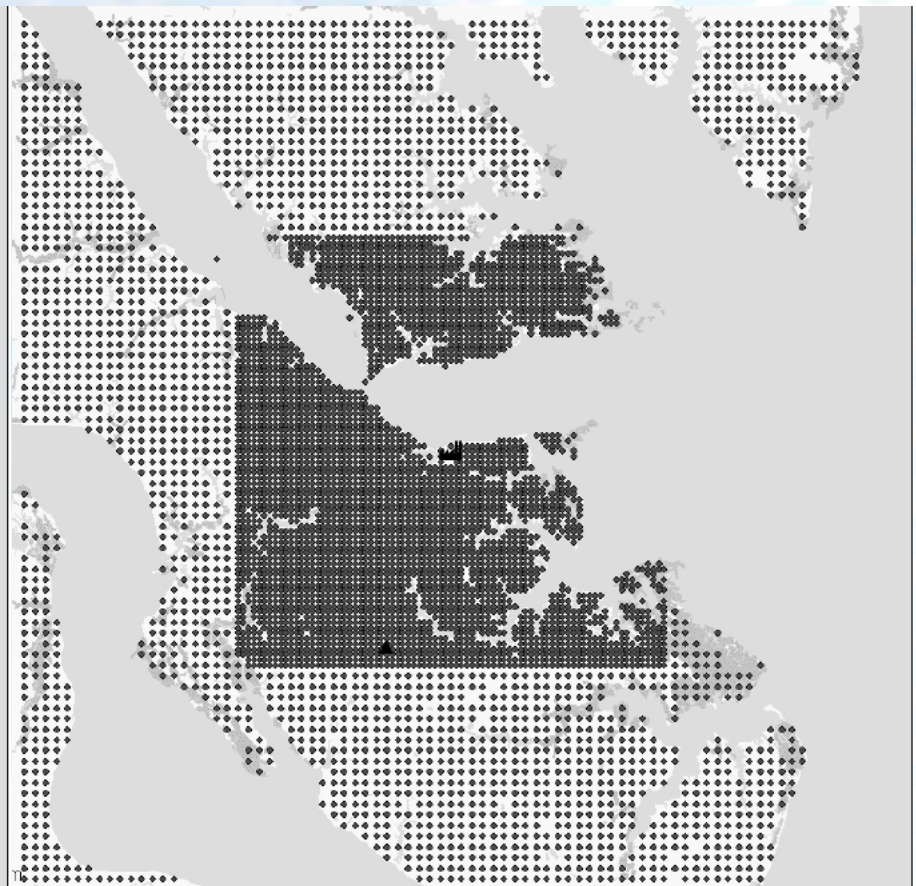
- ❖ Late installation holding up the achieving of a three year data set
- ❖ Relocation issues
- ❖ Siting for 1-hour impacts
- ❖ Partnering between air agencies and stakeholders
- ❖ Modeling to pick the best monitor sites excluding areas where fixed monitors could not locate (e.g., waterways)

Exclusion Zones from Modeling Conducted to Select Monitors

Traditional Grid



Exclusion Grid



10
1416

Modeling for Monitor Site Location Process

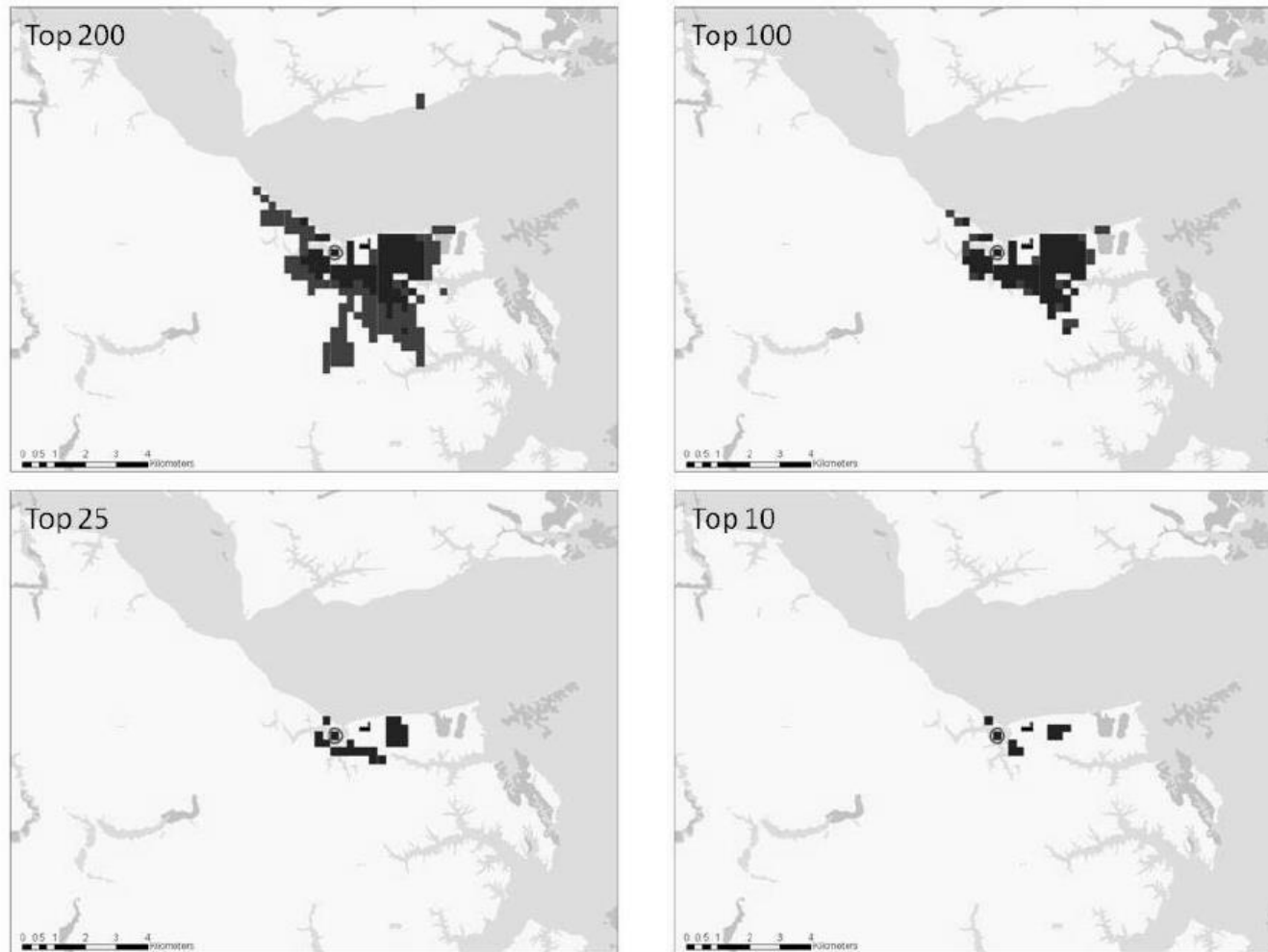


Figure 5. Locations of Top 200, 100, 25, and 10 normalized design values.

Technical Considerations - Modeling

> Modeling TAD

- ❖ Focus on 1-hour SO₂ concentrations
- ❖ Use the AERMOD (Version 14134) Model
- ❖ Style of modeling is unique to the area designation process and include three specific inputs: emissions, stack height, and meteorology

79FR 27463

1. Inputs for Designations Modeling

There are 3 air quality modeling inputs used for designations modeling that would differ from the permit and implementation plan modeling requirements set forth in Appendix W of 40 CFR part 51. As noted above, the objective of this designations modeling approach is to assess actual, current air quality. The 3 modeling inputs that are required to reflect actual air quality are: emissions data, stack height and years of meteorological data.

Technical Considerations - Modeling

- > Emissions data for designation modeling
 - ❖ A change from other kinds of regulatory modeling that use potential or allowable emissions
 - ❖ Designations depend on understanding of actual emissions
 - ❖ EPA recommends the most recent 3 years
 - ❖ Again in Section 3.b.1.a, EPA states their faith in modeling:

SO₂ NAAQS, the EPA believes that dispersion modeling is an appropriate option for representing current (or recent) SO₂ air quality.

Technical Considerations - Modeling (cont)

- > Emissions data for designation modeling
 - ❖ The range of options for estimating actual emissions is discussed in the modeling TAD
 - ❖ States could opt for using allowables
- > Consideration of proposed controls or emission reductions (e.g., MATS, renewed Title Vs, boiler MACT)

Technical Considerations - Modeling (cont)

> Stack Height

- ❖ For projecting future air quality, GEP must be used
- ❖ Actual stack height should be used to characterize actual air quality



Technical Considerations - Modeling (cont)

> Meteorology

- ❖ Permit & SIP modeling require 5 years of NWS or 1 year of onsite data
- ❖ For characterizing actual air quality at a monitor, use the most recent 3 years
- ❖ 3 years should match the 3 years of actual emissions used in modeling

Technical Considerations - Modeling (cont)

> General

- ❖ Modeling protocols should be developed
- ❖ Source by source or could be standardized across all sources in state
- ❖ Elements in the protocol are found in the modeling TAD
- ❖ Modeling due by January 13, 2017

PM2.5 NAAQS Update - Finalized SIP Requirements Rule and PM2.5 Modeling Guidance

NRDC v. EPA - January 4, 2013

- > The U.S. Court of Appeals for the D.C. Circuit remanded the EPA's 2007 PM2.5 Implementation Rule (40 CFR Part 51, Subpart Z).
- > EPA erred in implementing the 1997 PM2.5 standards solely pursuant to the general implementation provisions of subpart 1 of part D, title I of the CAA, without also considering the particulate matter-specific provisions of subpart 4.
- > EPA was directed to repromulgate the rule pursuant to subpart 4 of part D, title I of the Clean Air Act but no deadline was imposed by the court.
- > EPA proposed amendments on November 21, 2013 (78FR 69806)

Identification of Nonattainment Classification and Deadlines for Submission of SIP Provisions for the 1997 PM2.5 NAAQS and 2006 PM2.5 NAAQS

- > EPA finalized the November 21, 2013 proposal on June 2, 2014 (79FR 31566)
- > Brings subpart 4 PM2.5 requirements for NA designated areas
- > NA area designations identified according to subpart 4 criteria for both the 1997 PM2.5 NAAQS (old annual NAAQS) and the 2006 NAAQS (24-hr)
 - ❖ “Subpart 4 of the CAA, section 188, provides that all areas designated nonattainment are initially classified “by operation of law” as “Moderate” nonattainment areas, and they remain classified as Moderate nonattainment areas unless and until the EPA later reclassifies them as Serious nonattainment areas or the EPA determines that an area has not attained the PM2.5 NAAQS by the area’s applicable attainment date.”
 - ❖ “Pursuant to subpart 4 of the CAA, section 188, and section 301 of the CAA, the EPA....is identifying the classification of all PM2.5 areas currently designated nonattainment for the 1997 and 2006 NAAQS as “Moderate.””

		2006 PM-2.5 Nonattainment Areas				1997 PM-2.5 Nonattainment Areas				
State(s)	General Area Name (see footnote)	2010 Pop.	No. Ctys	Category/ Class	24-hr Design Value (2006-2008)	2010 Pop.	No. Ctys	Category/ Class	Annual Design Value (2001-2003)	
AK	General Area Name (see footnote)	Fairbanks	87,456	1	NonAtt	41				
AL-TN-GA	Chattanooga					470,921	4	NonAtt	16.1	
AZ	Nogales	30,622	1	NonAtt	40					
AZ	West Central Pinal	52,314	1	NonAtt	48					
CA	Chico	217,626	1	NonAtt	69					
CA	Imperial County	154,061	1	NonAtt	36					
CA	Los Angeles-South Coast Air Basin	15,716,242	4	NonAtt	49	15,716,335	4	NonAtt	27.8	
CA	Sacramento	2,206,060	5	NonAtt	56					
CA	San Francisco-Bay Area	6,971,067	9	NonAtt	36					
CA	San Joaquin Valley	3,842,165	8	NonAtt	70	3,842,165	8	NonAtt	21.8	
CA	Yuba City-Marysville	164,955	2	NonAtt	47					
DC-MD-VA	Washington					5,047,479	14	NonAtt	15.8	
GA	Atlanta					5,265,299	22	NonAtt	18.0	
GA	Macon					158,123	2	NonAtt	15.2	
GA	Rome, GA					96,317	1	NonAtt	15.7	
KY-IN	Louisville					1,018,904	5	NonAtt	16.9	
MD	Baltimore					2,662,691	6	NonAtt	16.7	
MO-IL	St. Louis					2,572,706	9	NonAtt	17.5	
MT	Libby					9,429	1	NonAtt	16.2	



NY-NJ-CT	New York	20,404,481	22 [Split]	NonAtt	38	20,404,481	22 [Split]	NonAtt	17.7
OH-WV	Steubenville-Weirton	124,454	3 [Split]	NonAtt	41	124,454	3 [Split]	NonAtt	17.8
OR	Klamath Falls	46,969	1	NonAtt	46				
OR	Oakridge	4,261	1	NonAtt	40				
PA	Allentown	647,232	2	NonAtt	36				
PA	Harrisburg-Lebanon-Carlisle	1,072,046	4	NonAtt	36	637,074	3	NonAtt	15.8
PA	Johnstown	156,923	2	NonAtt	see Design Value Notes	156,923	2	NonAtt	15.8
PA	Lancaster	519,445	1	NonAtt	37	519,445	1	NonAtt	17.0
PA	Pittsburgh-Beaver Valley	20,789	1	NonAtt	53	20,789	1	NonAtt	21.2
		2,142,981	8	NonAtt	36	2,142,981	8	NonAtt	21.2
PA	Reading					411,442	1	NonAtt	16.4
PA	York					434,972	1	NonAtt	17.3
PA-NJ-DE	Philadelphia-Wilmington	5,798,152	9 [Split]	NonAtt	36	5,798,152	9 [Split]	NonAtt	16.4
TN	Knoxville	681,523	5	NonAtt	see Design Value Notes	681,523	5	NonAtt	16.8
UT	Provo	517,537	1	NonAtt	44				
UT	Salt Lake City	1,665,137	5	NonAtt	48				
UT-ID	Logan	125,198	2	NonAtt	36				
WA	Seattle-Tacoma	539,682	1	NonAtt	44				
WI	Milwaukee-Racine	1,533,034	3	NonAtt	37				
WV	Charleston	248,549	2	NonAtt	36	248,549	2	NonAtt	17.1
WV-MD	Martinsburg - Hagerstown					251,599	2	NonAtt	16.3



PM-2.5 Nonattainment Areas (1997 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.

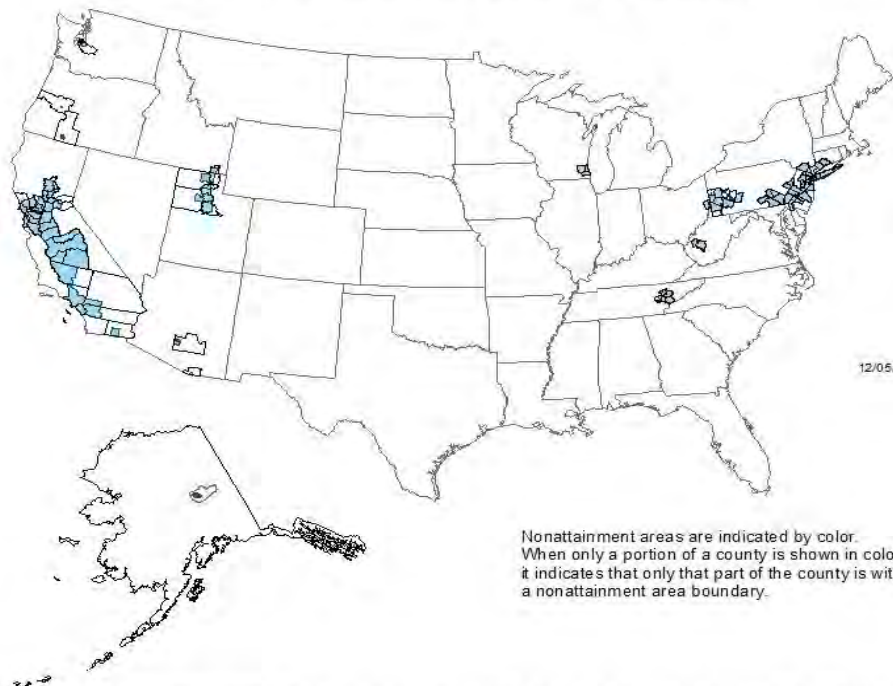
12/05/2013

The New Jersey portion of the Philadelphia-Wilmington, PA-NJ-DE PM-2.5 nonattainment area (1997 Standard) has been redesignated, while the Pennsylvania and Delaware portions have not. The entire area is not considered in maintenance until all states in a multi-state area are redesignated.

The New Jersey and Connecticut portions of the New York-N. New Jersey-Long Island, NY-NJ-CT PM-2.5 nonattainment area (1997 Standard) have been redesignated, while the New York portion has not. The entire area is not considered in maintenance until all states in a multi-state area are redesignated.

The Ohio portion of the Steubenville-Weirton, OH-WV PM-2.5 (1997 Standard) nonattainment area has been redesignated, while the West Virginia portion has not. The entire area is not considered in maintenance until all states in a multi-state area are redesignated.

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Identification of Nonattainment Classification and Deadlines for Submission of SIP Provisions for the 1997 PM2.5 NAAQS and 2006 PM2.5 NAAQS (cont.)

- > New PM2.5 SIPs due to EPA by December 31, 2014
- > States most affected by the rule:
 - ❖ States that have 1997 and/or 2006 PM2.5 NAAQS nonattainment areas that meet one of the following criteria:
 - ◆ There has been no SIP submission for the 1997 and/or 2006 PM2.5 NAAQS;
 - ◆ There is no clean data determination; and
 - ◆ A complete redesignation request will not have been submitted prior to December 31, 2014.

Identification of Nonattainment Classification and Deadlines for Submission of SIP Provisions for the 1997 PM2.5 NAAQS and 2006 PM2.5 NAAQS (cont.)

- > Deadlines for States with PM2.5 NA areas (1997 and 2006 standards)
 - ❖ “To the extent that implementation under subpart 4 would impose additional requirements for areas designated nonattainment, the EPA believes that those requirements are not “applicable” ...in any area that has submitted a complete redesignation request prior to the due date for these requirements, and thus the EPA is not required to consider subpart 4 requirements with respect to areas that have submitted a complete redesignation request prior to **December 31, 2014.**”
 - ❖ Subpart 4 establishes an attainment deadline of no later than the end of the sixth calendar year after designation as nonattainment.
 - ♦ Nonattainment area designations for most areas became effective in December 2009 (74 FR 58688) - 2006 24-hour PM2.5 NAAQS.
 - ♦ These areas are subject to a Moderate area attainment deadline under subpart 4 of no later than **December 31, 2015** - 1 YEAR after SIP submittals to EPA

Attainment Demonstration Approved (without Subpart 4 SIP provisions - after January 4, 2013, NRDC v. EPA)

- > EPA not interested in retro-actively applying NRDC v. EPA to areas that have achieved (or will achieve in the near-term) attainment
- > Redesignation of the Indianapolis Area to Attainment of the 1997 Annual Standard for Fine Particulate Matter (78FR 20856 - 4/8/13):
 - ❖ “EPA has viewed the obligations to submit attainment-related SIP planning requirements of subpart 4 as inapplicable for areas that EPA determines are attaining the standard.”
 - ❖ “Because the Indianapolis area has already attained the 1997 PM_{2.5} NAAQS with its current approach to regulation of PM_{2.5} precursors, EPA believes that it is reasonable to conclude in the context of this redesignation that there is no need to revisit the attainment control strategy with respect to the treatment of precursors.”
 - ❖ The EPA’s longstanding interpretation is that “applicable requirements” are those whose deadline for submission occurs **prior** to the state’s submission of a complete redesignation request.”

Attainment Demonstrations and CAIR

- > EPA believes states can rely on CAIR even with some remaining uncertainty surrounding CSAPR.
- > 78FR 20856 - 4/8/13:
 - ❖ “If EPA were prevented from relying on reductions associated with CAIR in redesignation actions, states would be forced to impose additional, redundant reductions on top of those achieved by CAIR. EPA believes this is precisely the type of irrational result the Court sought to avoid by ordering EPA to continue administering CAIR.”
 - ❖ “EPA believes it is appropriate to allow states to rely on CAIR, and the existing emissions reductions achieved by CAIR, as sufficiently permanent and enforceable for regulatory purposes such as redesignations.”

“Final” Modeling Guidance for PM_{2.5}

- > 2013-2014
 - Draft Guidance for PM_{2.5} Permit Modeling, March 4, 2013
 - Final Guidance for PM_{2.5} Permit Modeling, May 20, 2014



EPA-454/B-14-001
May 2014

Guidance for PM_{2.5} Permit Modeling

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Air Quality Assessment Division
Research Triangle Park, North Carolina

PM_{2.5} Changes to the Draft 2013 Guidance

- > Not as much emphasis on the SILs
- > Clarifications with respect to procedures for addressing primary and secondarily formed PM_{2.5}
- > New example of a qualitative & quantitative hybrid secondary PM_{2.5} assessment
- > Revision of second tier cumulative NAAQS modeling analysis
- > Revision of PSD increment modeling analysis

Use of the SIL for PM_{2.5}

- > Any permitting authority wishing to use a particular SIL value as a screening tool in a significant impact analysis should determine whether a substantial portion of the NAAQS has already been consumed.
 - ❖ Preconstruction monitoring data (or adequately representative monitoring data from an existing monitoring network) should be evaluated against the respective PM_{2.5} NAAQS.
 - ❖ If the difference between the NAAQS and the measured PM_{2.5} background in the area is greater than the applicable SIL value, then the EPA believes it would be sufficient in most cases for permitting authorities to conclude that a source with an impact below that SIL value will not cause a new NAAQS violation.
 - ❖ “To the extent a permitting authority wishes to use any of the SILs values in the vacated Sections 51.166(k)(2) or 52.21(k)(2) as a screening tool to determine whether it is necessary to conduct a cumulative analysis of NAAQS compliance, the permitting authority must first examine background air quality concentrations to determine whether a substantial portion of the NAAQS has been consumed.” (May 20, 2014 Guidance - Page 19)

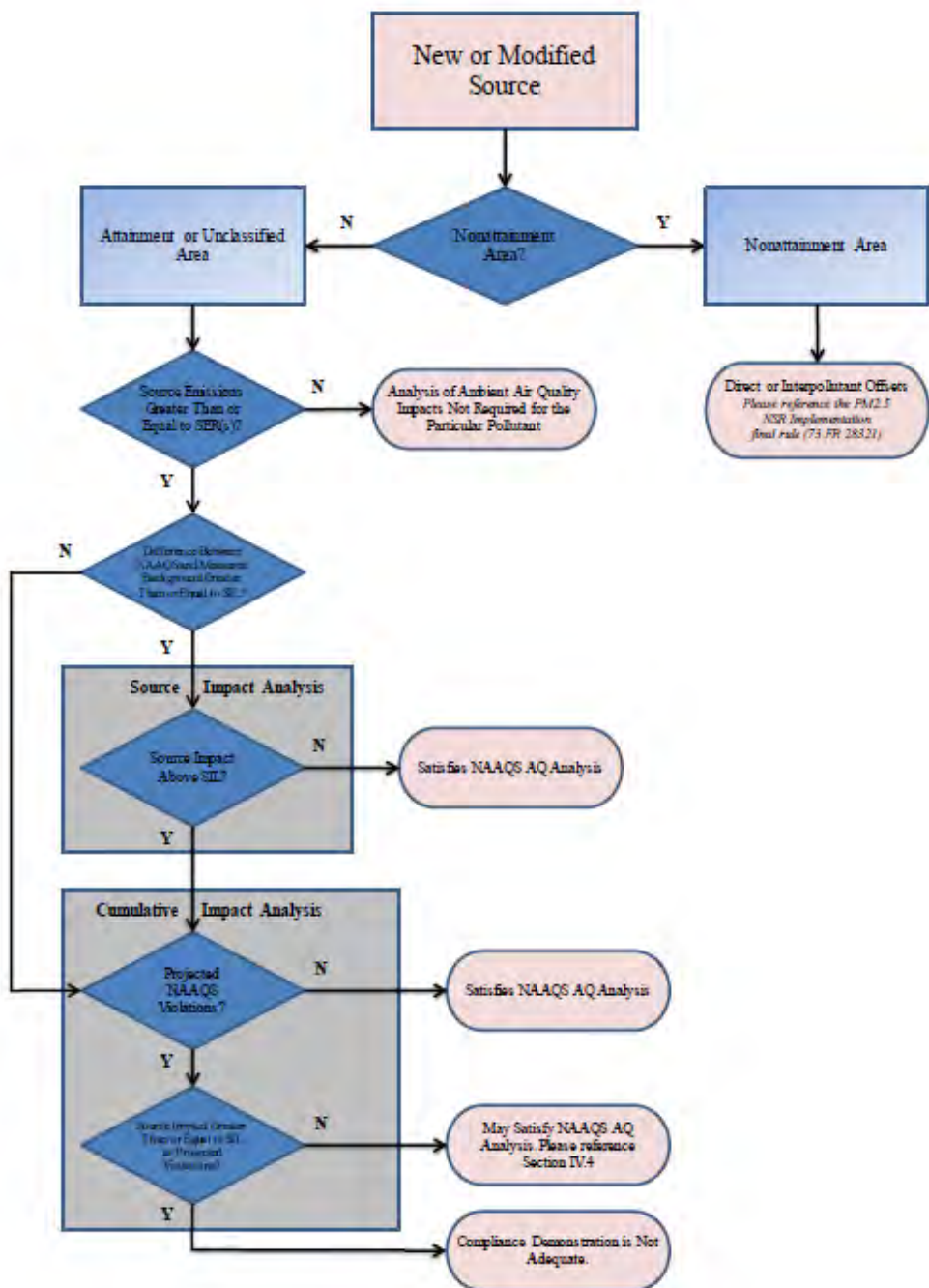
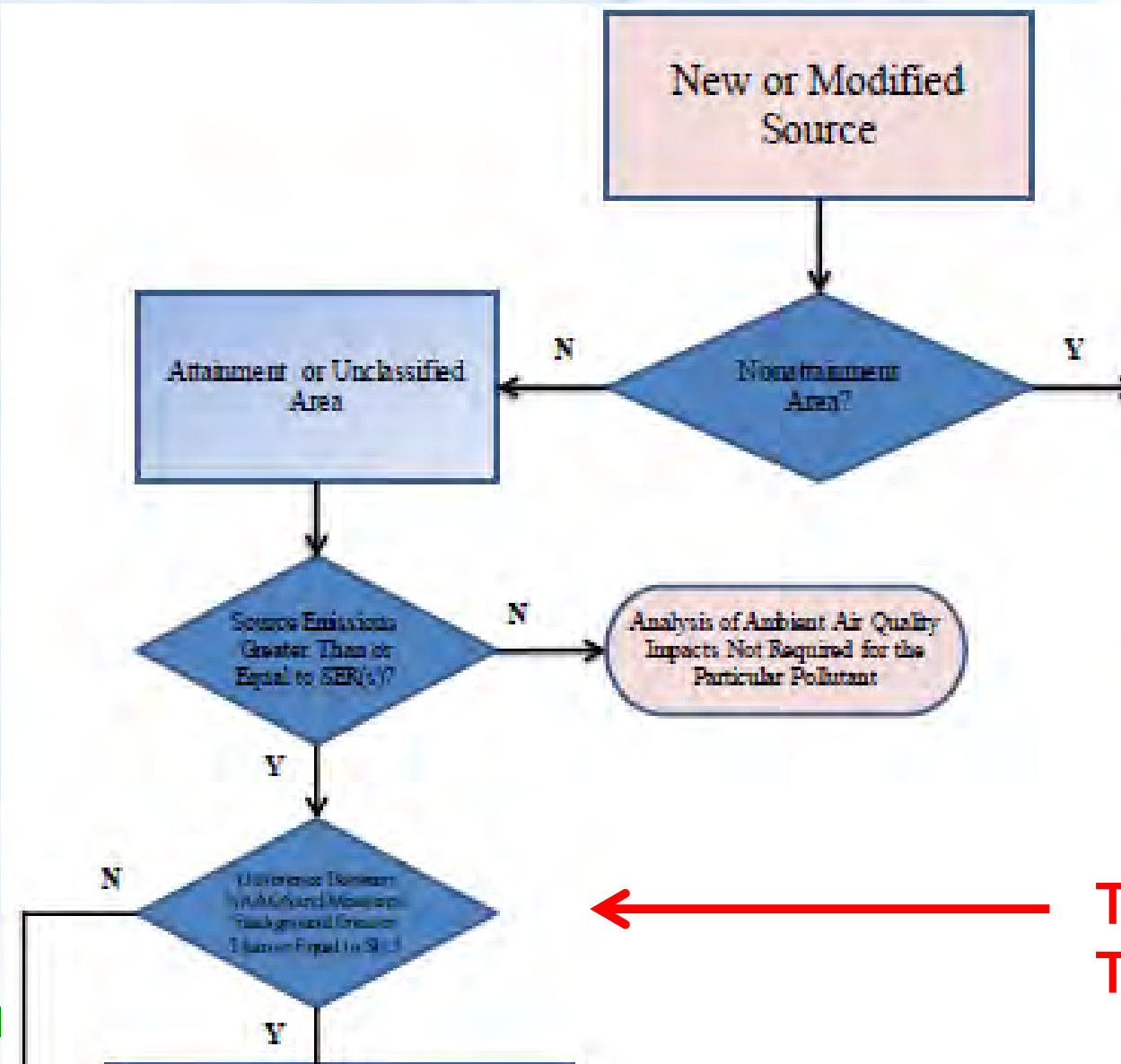


Figure II-1.
Overview of PM_{2.5}
NAAQS
Compliance
Demonstration -
PSD

SIL Determination Decision Tree - NAAQS Assessments

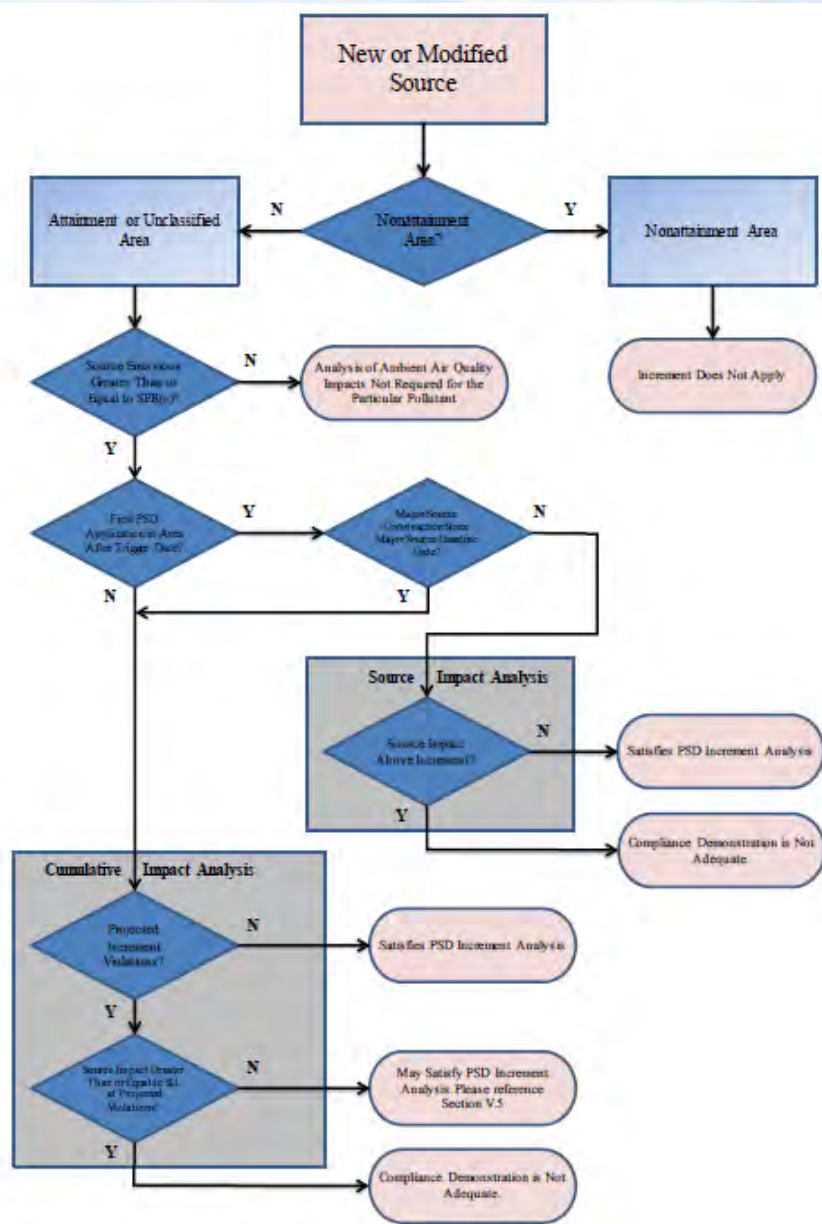


The "NAAQS"
Test

PM_{2.5} Increments

- > As shown in Figure II-2, first source into increment area follow typical methodology; sources thereafter go straight to cumulative increment analysis (SIL does not apply)
- > New text on using monitoring to track increment consumption and expansion (EPA will clarify in future as experience is gained)
- > Establishing baseline concentration and area is critical

Figure II-2. Overview of PSD Increment Compliance Demonstration - PSD

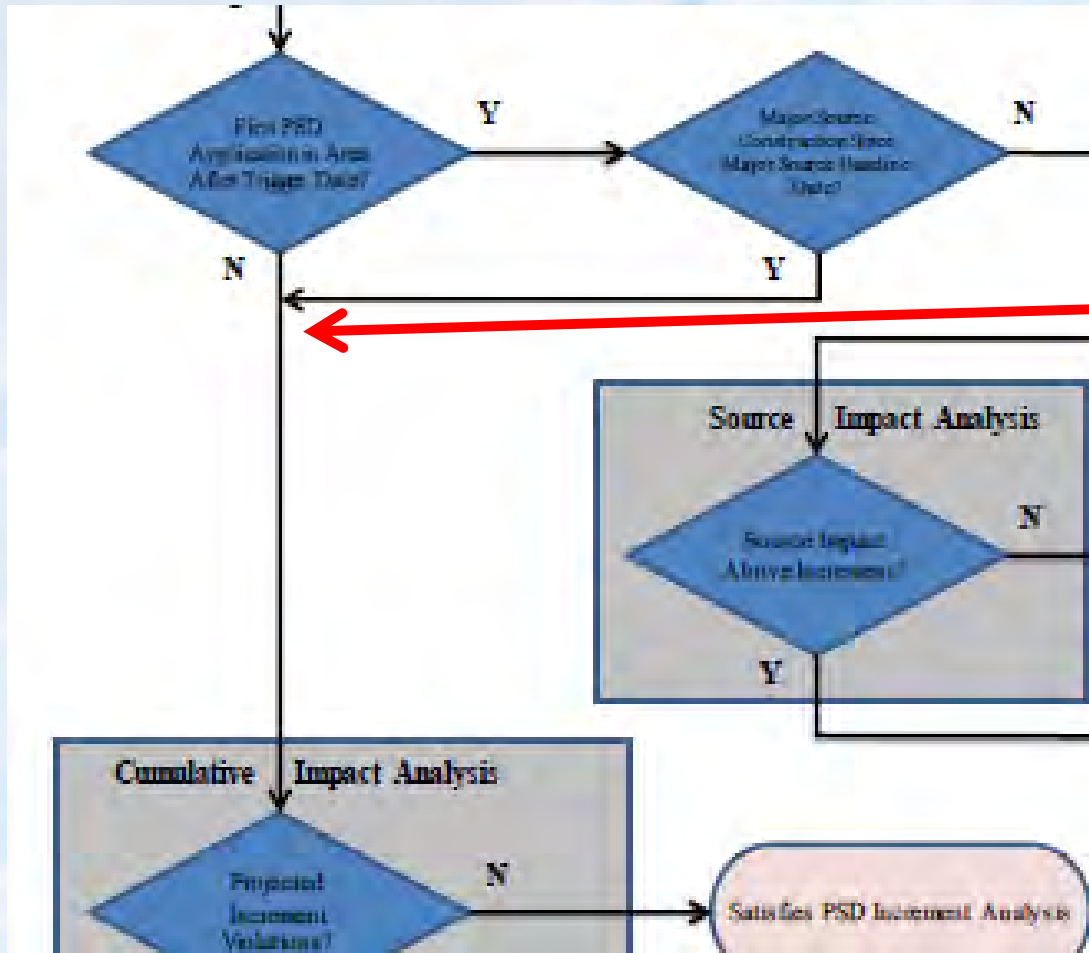


PSD PM2.5 Increment Assessments

> Per Guidance:

- ❖ “Since the trigger date has only recently been established (i.e., October 20, 2011), for the next several years, a new or modified source being evaluated for increments compliance will often be the first source with increment-consuming emissions in the area.”
- ❖ “Under this situation, a permitting authority may have sufficient reason to conclude that the impacts of the new or modified source (based on the approach for conducting source impact analysis described below) may be compared directly to the allowable increments, without the need for a cumulative modeling analysis.”
- ❖ “Such a situation would involve the new or modified source representing the first PSD application in the area after the trigger date, which establishes the minor source baseline date and baseline area, and confirmation that no relevant major source construction has already occurred since the major source baseline date.”

Increment Applicability Test



Skip to Cumulative Increment Test if New Source/Mod Is NOT First PSD (after 10/20/2011)

PM_{2.5} Compliance Demonstration: Assessment Cases

- > Four different scenarios or assessment cases in guidance by EPA
- > These scenarios define what air quality analyses, if applicable, that an applicant would follow to demonstrate compliance with the PM_{2.5} NAAQS and Increments
- > These scenarios did not change from the 2013 draft guidance

Overview of Modeling Procedures

EPA Recommended Approaches for Assessing Primary and Secondary PM_{2.5} Impacts - Primary

Assessment Case	Description of Assessment Case	Primary Impacts Approach	Secondary Impacts Approach
Case 1: No Air Quality Analysis	Direct PM _{2.5} emissions < 10 tpy SER NO _x and SO ₂ emissions < 40 tpy SER	N/A	N/A
Case 2: Primary Air Quality Impacts Only	Direct PM _{2.5} emissions ≥ 10 tpy SER NO _x and SO ₂ emissions < 40 tpy SER	Appendix W preferred or approved alternative dispersion model	N/A
Case 3: Primary and Secondary Air Quality Impacts	Direct PM _{2.5} emissions ≥ 10 tpy SER NO _x and/or SO ₂ emissions ≥ 40 tpy SER	Appendix W preferred or approved alternative dispersion model	<ul style="list-style-type: none"> • Qualitative • Hybrid qualitative / quantitative • Full quantitative photochemical grid modeling
Case 4: Secondary Air Quality Impacts Only	Direct PM _{2.5} emissions < 10 tpy SER NO _x and/or SO ₂ emissions ≥ 40 tpy SER	N/A	<ul style="list-style-type: none"> • Qualitative • Hybrid qualitative / quantitative • Full quantitative photochemical grid modeling

Source: Page viii of EPA's *Guidance for PM_{2.5} Permit Modeling*, May 2014

Direct PM_{2.5} Assessment Methods

- > Use AERMOD
- > To compare with SIL, use highest of 5-year average of maximum modeled 24-hour or annual PM_{2.5} concentrations - Consistent with prior guidance
- > To compare with NAAQS (24-hour assessment), new “First Tier” approach includes the use of the design model concentration (98%-tile) and the design monitored concentration (98%-tile)
 - ❖ Less stringent than previous guidance, which required highest model concentration added to monitored design concentration

Overview of “Primary” PM_{2.5} Impacts

(1 of 2)

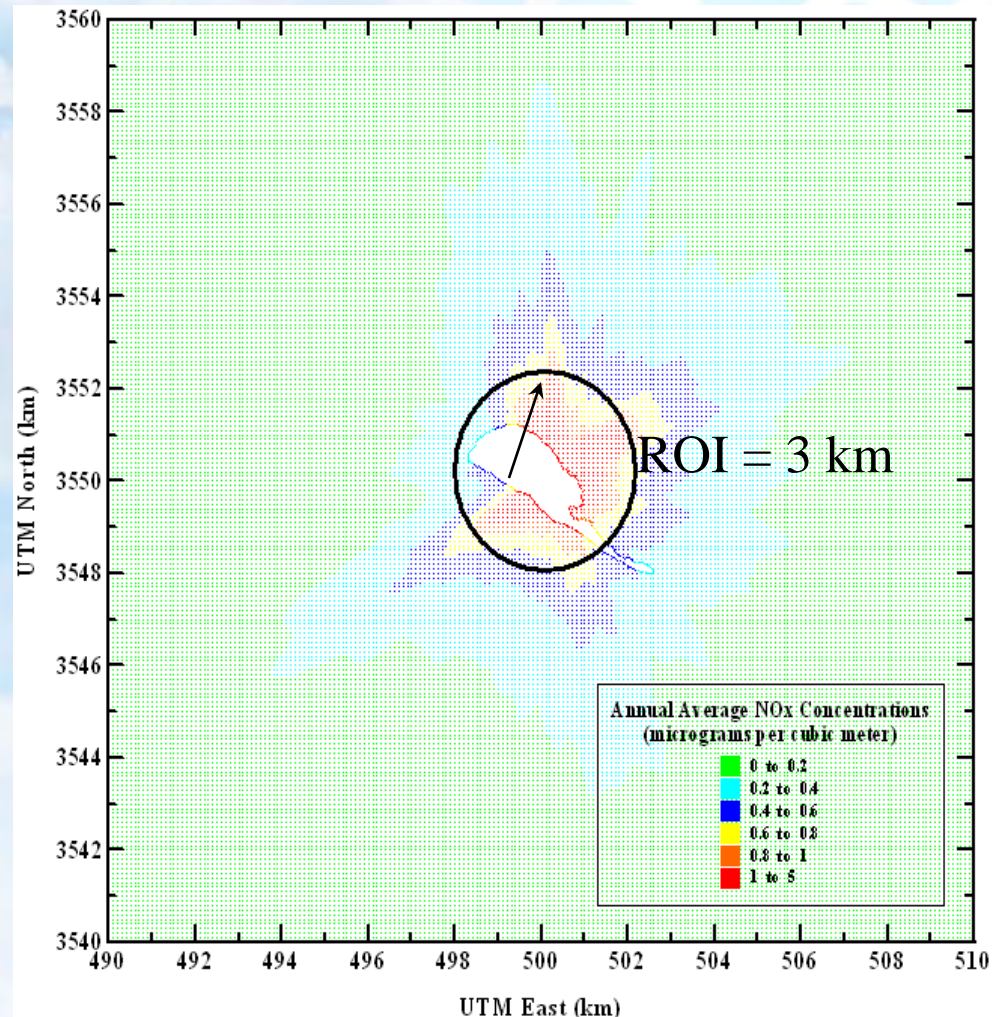
- > Step 1 - Model Project
- > Step 2
 - ❖ **If impacts < SIL - Finished**
 - ◆ Annual SIL = 0.3 mg/m³
 - ◆ 24-hr SIL = 1.2 mg/m³
 - ❖ **Or if impacts < NAAQS-Ambient - Finished**
 - ❖ If Impacts > SIL - Step 3 or if Impacts > NAAQS-Amb - Step 3

> Step 3

- ❖ Define ROI
(Radius of Impact)



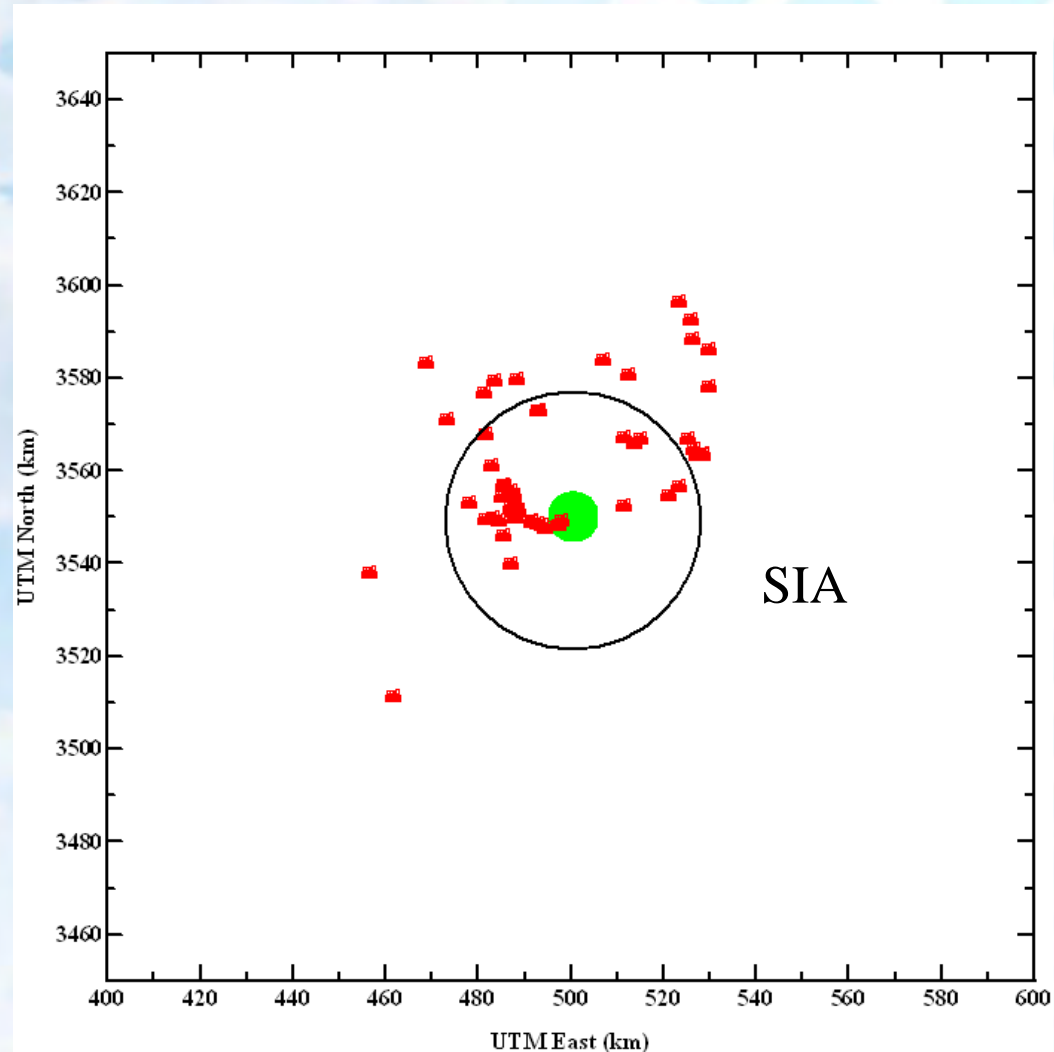
- ❖ Define SIA = ROI + 50



Overview of “Primary” PM_{2.5} Impacts

(2 of 2)

- > Step 4 - Define Regional Sources
- > Step 5 - Model Project + Regional Sources
- > Step 6 - Define background concentration
- > Step 7 - Impact + background < NAAQS



Overview of Modeling Procedures

EPA Recommended Approaches for Assessing Primary and Secondary PM_{2.5} Impacts - Secondary

Assessment Case	Description of Assessment Case	Primary Impacts Approach	Secondary Impacts Approach
Case 1: No Air Quality Analysis	Direct PM _{2.5} emissions < 10 tpy SER NO _x and SO ₂ emissions < 40 tpy SER	N/A	N/A
Case 2: Primary Air Quality Impacts Only	Direct PM _{2.5} emissions ≥ 10 tpy SER NO _x and SO ₂ emissions < 40 tpy SER	Appendix W preferred or approved alternative dispersion model	N/A
Case 3: Primary and Secondary Air Quality Impacts	Direct PM _{2.5} emissions ≥ 10 tpy SER NO _x and/or SO ₂ emissions ≥ 40 tpy SER	Appendix W preferred or approved alternative dispersion model	<ul style="list-style-type: none"> Qualitative Hybrid qualitative / quantitative Full quantitative photochemical grid modeling
Case 4: Secondary Air Quality Impacts Only	Direct PM _{2.5} emissions < 10 tpy SER NO _x and/or SO ₂ emissions ≥ 40 tpy SER	N/A	<ul style="list-style-type: none"> Qualitative Hybrid qualitative / quantitative Full quantitative photochemical grid modeling

Source: Page 21 of EPA's *Draft Guidance for PM_{2.5} Permit Modeling*, March 2013



CAMx or CMAQ
Models (CALPUFF?)
Trinity
Consultants

Secondary PM_{2.5} Assessment Methods

- > For Cases 3-4, some level of assessment of precursor emissions to the secondary formation of PM_{2.5} is required; three ways for that evaluation
- > 1. Qualitative
 - ❖ Develop “appropriate conceptual description of PM_{2.5}”
- > 2. Hybrid Qualitative/Quantitative
 - ❖ Use of local/region specific “offset ratios” for precursor emissions
- > 3. Full Quantitative
 - ❖ Photochemical Models or other models as modifications become more applicable, i.e., CAMx or CMAQ
- > Combination of direct and secondary PM_{2.5} will require additional thought and assessment

1. Qualitative Assessment of Secondary PM_{2.5}

- > Completely qualitative needs much characterization
 - ❖ Develop “appropriate conceptual description of PM_{2.5}”
- > The following may be important considerations:
 - ❖ Characterization of current 24-hour and annual design values
 - ❖ Seasonality and speciated composition of the current PM_{2.5} concentrations and any long term trends occurring
 - ❖ What are typical background concentrations of precursors and how will project affect concentrations?
 - ❖ Characterize meteorological conditions of region and associated periods of higher and lower PM_{2.5} concentrations
 - ❖ Analysis of existing photochemical grid modeling for regional haze, ozone, and PM_{2.5} SIPs
- > Example from Region 10 provided - Not a realistic case for many “urban” PSDs

2. Hybrid Qualitative/Quantitative Assessment of Secondary PM_{2.5}

> Methods

- ❖ Add analysis of local/region specific “offset ratios” for precursor emissions (i.e. how readily the precursors form the fine particles in the modeled domain)
 - ❖ This approach may include a modeled “overlay” of direct PM_{2.5} and a simplified approach for assessing the secondary formation
 - ❖ States could adopt local/regional ratios
- > EPA recommends consultation with Regional Office including approval of modeling protocol

2. Hybrid Qualitative/Quantitative Assessment of Secondary PM_{2.5}

- > **Hybrid Qualitative/Quantitative** - focus on SO₂ and NO_x
 - ❖ Add peer-review literature for the region
 - ❖ Add modeling for SO₂ and NO_x emissions compared to their SIL
 - ❖ Convert SO₂ and NO_x to PM_{2.5} using “pollutant offset ratios” and model
 - ❖ Note that using Q/D metric is **NOT** acceptable

3. Quantitative Assessment of Secondary PM_{2.5}

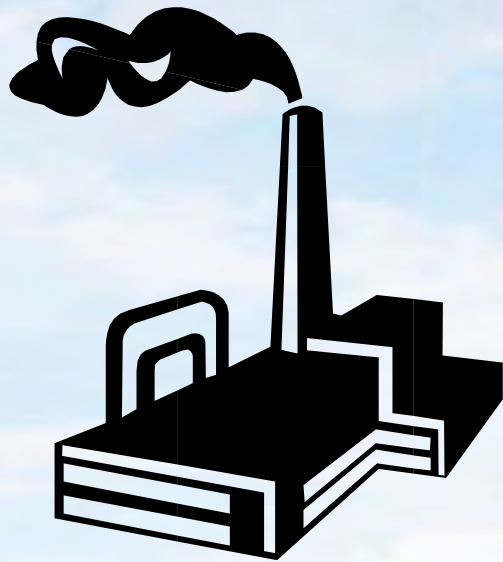
> Quantitative approach

- ❖ Photochemical Model (e.g., CAMx or CMAQ)
- ❖ Only expected to be needed in “rare” cases (III.2.3)
- ❖ EPA recommends consultation with Regional Office including approval of modeling protocol
- ❖ Very expensive and time consuming
- ❖ Requires EPA Region and EPA Headquarters approval
- ❖ Other chemistry plume models? (e.g., SCICHEM, updated CALPUFF)

Noted Changes to the Guidance

- > Use of SIL for PSD increment analysis limited - Must be first PSD after 11/20/2011 and no new major sources/mods since 11/20/2010 in baseline area
- > For NAAQS assessments - “Headroom” needed between NAAQS and current ambient levels
 - ❖ Ambient levels evaluated using monitored data
- > Complications noted when photochemical modeling is used for quantitative analysis (Case 3)
- > Revision of Tier 2 modeling/monitoring approach (see Appendix E in May 20, 2014 guidance)
- > Revision of PSD increment approaches (see Section V in May 20, 2014 guidance)
- > New example of qualitative/quantitative case in Region 6 (see Appendix D in May 20, 2014 guidance)

EPA's New Case Study for Qualitative/Quantitative Assessment - Appendix D



Case Study - Sasol in Louisiana

- > Permit application 2013/early 2014
- > Coordinated with EPA Region 6 and LDEQ to ensure analysis was robust and defensible
- > Used interpollutant trading ratios for NO_x and SO₂ to PM_{2.5}
 - ❖ 40 Tons SO₂ per ton of PM_{2.5}
 - ❖ 100 Tons NO_x per ton of PM_{2.5}
- > Total “Equivalent” PM_{2.5} = Primary PM_{2.5} + (SO₂/40) + (NO_x/100):
 - ❖ Primary PM_{2.5} = 612 TPY
 - ❖ SO₂ = 121 TPY
 - ❖ NO_x = 1595 TPY
 - ❖ Total “Equivalent” PM_{2.5} = 631.0 ton/year
 - ❖ Total PM_{2.5} Impact (µg/m₃) = Primary PM_{2.5} Impact (µg/m₃) * (Total Equivalent Primary PM_{2.5} (tpy) / Primary PM_{2.5} (tpy))
 - ❖ Total Equivalent PM_{2.5} / Primary PM_{2.5} = 631.0 tpy / 612 tpy = 1.03
- > Based on projected emissions - showed inconsequential impacts of secondary PM_{2.5} formation
- > Also showed that nitrates contribution to local air quality was small to corroborate conclusions

Brief Ozone NAAQS Update (current and proposed)

Recent Ozone Actions/Issues

- > Current Ozone (2008) NAAQS implementation plan
- > Update on timing of new ozone NAAQS
- > EPA proposal concerning relationship between RACT and NO_x SIP/CAIR rules

2008 Ozone NAAQS (current NAAQS - 75 ppb)

- > 2008 Ozone NAAQS Implementation Rule
 - ❖ Proposal published 6/6/13 (78FR 34178) - See NSR section beginning on Page 34216
 - ◆ Proposal addresses ozone SIP requirements for ozone attainment areas as well as those not meeting any one or more of the following: pre-1997 1-hour NAAQS, 1997 NAAQS, and the current 2008 NAAQS
 - ◆ EPA's general plan is to encourage states to adopt the most stringent SIP limitations based on the highest level of ozone classification (moderate, serious, etc.)
 - ❖ Anticipated publication of final implementation rule: 2014?
 - ❖ State NA Ozone SIPs due in mid-2015

2008 Ozone NAAQS - Proposed Transitional NSR Permitting Requirements

TABLE 2—2008 OZONE NAAQS TRANSITION OBLIGATIONS

Designation for 2008 NAAQS	Designation for previous NAAQS (at time of revocation)	Proposed NSR/PSD obligations	Other proposed transition obligations
1. Attainment	Attainment/Maintenance	PSD remains in effect	<ul style="list-style-type: none"> —Area remains subject to existing section 175A maintenance plan for the previous ozone NAAQS and requirements already in the SIP, subject to revision consistent with sections 110(l) and 193. —Section 175A maintenance plan satisfies maintenance requirement under section 110(a)(1).
2. Attainment	Nonattainment for 1997 ozone NAAQS only; or nonattainment for 1997 and 1-hour NAAQS.	Nonattainment NSR in effect until revocation of the 1997 ozone NAAQS; then PSD applies.	<ul style="list-style-type: none"> —Area remains subject to measures to meet nonattainment requirements already in its adopted SIP. Removable only with a section 110(l) demonstration and a section 193 demonstration if applicable. —Two alternatives to address section 110(a)(1) maintenance provision: (a) Area's approved PSD SIP satisfies section 110(a)(1) maintenance provision, or (b) additional maintenance showing under section 110(a)(1).
3. Nonattainment	Attainment/Maintenance	Nonattainment NSR applies based on 2008 ozone NAAQS classification.	<ul style="list-style-type: none"> —Area remains subject to existing section 175A maintenance plan for the previous NAAQS and requirements already in the SIP, subject to revision consistent with sections 110(l) and 193.
4. Nonattainment	Nonattainment for 1997 ozone NAAQS only; or nonattainment for 1997 and 1-hour ozone NAAQS.	Nonattainment NSR applies based on highest applicable classification.	<ul style="list-style-type: none"> —Area subject to all applicable anti-backsliding requirements for 1-hr and/or 1997 NAAQS. —Anti-backsliding obligations lifted when the area either is redesignated to attainment for the 2008 ozone NAAQS, or the EPA approves a redesignation substitute for the revoked 1-hour or 1997 NAAQS —EPA solicits comment on additional options for lifting anti-backsliding obligations.

Proposed “2010” Ozone NAAQS

- > 1/19/10 - FR proposal for new ozone standard - 75FR 2938 (January 19, 2010)
- > New proposed primary 8-hr standard
 - ❖ 0.060 - 0.070 ppm
 - ❖ 3-year average of 4th high (same as current)
- > Also proposed secondary standard
 - ❖ 7 - 15 ppm-hours
 - ❖ Designed to protect sensitive vegetation and ecosystems
 - ❖ Takes into account cumulative, seasonal effects of ozone on vegetation
- > January 26, 2011 - EPA formally requested advice from the CASAC “Ozone Reconsideration Panel.”
- > New ozone NAAQS delayed until 2015? See recent District Court Case <http://earthjustice.org/sites/default/files/files/Ozone-Motion-Summary-Judgment.pdf>

UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF CALIFORNIA - Case No.: 13-cv-2809-YGR - April 30, 2014

- > ORDER GRANTING PLAINTIFFS' (Sierra Club, et. al.) MOTION FOR SUMMARY JUDGMENT AND DENYING DEFENDANT'S (EPA) MOTION FOR SUMMARY JUDGMENT
- > EPA ORDERED to:
 - ❖ Issue a Proposed Rule based on its review of the national ambient air quality standards (“NAAQS”) for ozone no later than **December 1, 2014**
 - ❖ Issue a Final Rule no later than **October 1, 2015.**

Relationship between Regional Rules and Local NA Area Rules - PM and Ozone

- > 2008: United States Court of Appeals for the District of Columbia Circuit (*NRDC v. EPA*) remanded the provision of the Phase 2 Ozone Implementation Rule determining that the NOx SIP Call satisfies NOx RACT for EGUs
 - ❖ EPA had failed to show that compliance with the NOx SIP Call would achieve at least RACT-level reductions in each nonattainment area.
- > The issue as to whether the CAIR satisfies NOx RACT for EGUs was not addressed by the court in the *NRDC v. EPA* case.
 - ❖ However, the EPA decided that it would be appropriate to reconsider this determination also in light of the earlier decision in *NRDC v. EPA*.
- > On April 25, 2011, the EPA granted the petition for reconsideration of the presumption that compliance with the CAIR could satisfy RACT/RACM requirements for the 1997 PM_{2.5} NAAQS.
- > Proposed rule June 9, 2014 (79FR 32892) - “Withdrawal of the Prior Determination or Presumption That Compliance With the CAIR or the NOX SIP Call Constitutes RACT or RACM for the 1997 8-Hour Ozone and 1997 Fine Particle NAAQS”

Questions?

Jay Hofmann

jhofmann@trinityconsultants.com

Phone: 972-661-8100

