

# Air Modeling Update: Changes to Guideline on Air Quality Models SO2 Data Requirements Rule

*Pennsylvania Bar Institute's*

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*William B. Jones*

*Principal*



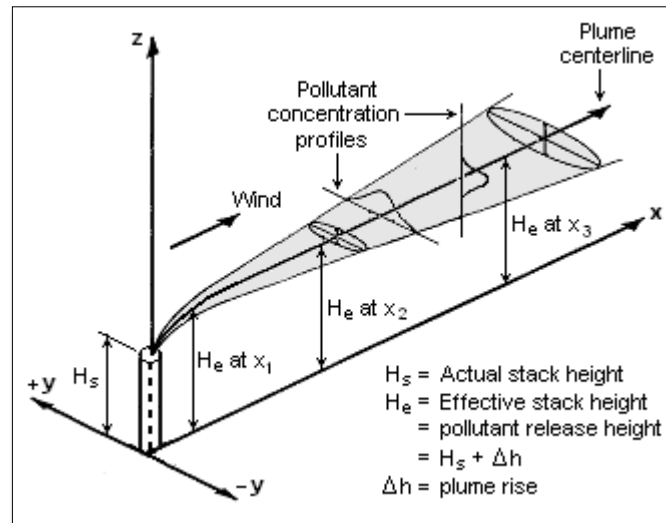
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# Outline

- Brief Modeling Overview
- Changes to Guideline on Air Quality Models
- SO<sub>2</sub> Data Requirements Rule
- Conclusions

# Brief Modeling Overview

- Air modeling is mathematical simulation of transport of pollutants through atmosphere
- Frequently used in permitting efforts, but also non-permitting applications
- Designed as regulatory tool, so inherently conservative
- Science and art



# *Changes to Guideline on Air Quality Models*



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# Changes to Guideline on Air Quality Models

## Background

- 40 CFR 51, Appendix W
- GAQM first published in April 1978 to provide consistency in air quality analyses
- Incorporated into Prevention of Significant Deterioration (PSD) regulations in June 1978, updated several times since then—most recently 2005

# Changes to Guideline on Air Quality Models Timeline

- July 2015: EPA proposed changes
- August 2015: 11<sup>th</sup> Conference on Air Quality Modeling held to discuss proposed changes
- Final rulemaking currently expected Summer 2016
- AWMA conference “Guideline on Air Quality Models: The New Path” held next week in Chapel Hill, NC



# Changes to Guideline on Air Quality Models

## Proposed Changes: AERMOD and Met Data

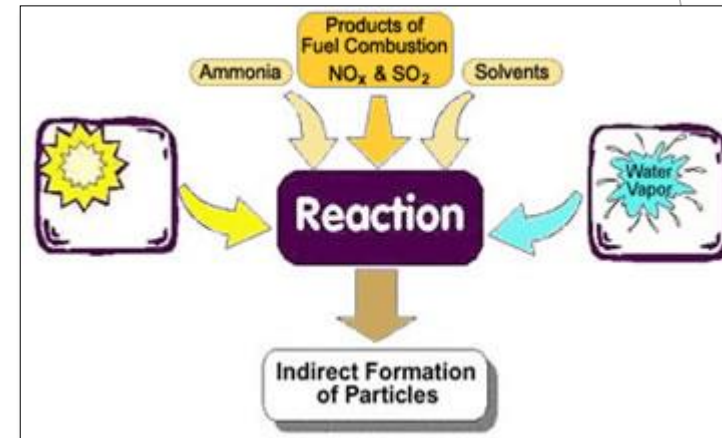
- Incorporation of BLP into AERMOD
  - Uses latest meteorological processing
  - Addresses 1-hr NAAQS
- Meteorological Datasets
  - Use of AERMINUTE now recommended
  - Mesoscale Model Interface (MMIF) now recommended when using prognostic meteorological data in AERMOD



# Changes to Guideline on Air Quality Models

## Proposed Changes: PM<sub>2.5</sub> Modeling

- AERMOD now recommended for Primary PM<sub>2.5</sub> impacts
- Somewhat nebulous two-tiered approach now recommended for Secondary PM<sub>2.5</sub> impacts
  - Use technically credible, previously-existing analysis concerning precursor emissions and a source's impacts if available
  - If not, conduct dispersion modeling





# Changes to Guideline on Air Quality Models

## Proposed Changes: PM<sub>2.5</sub> Modeling (cont'd)

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

# Changes to Guideline on Air Quality Models

## Proposed Changes: Demotion of CALPUFF

- Used over last 15 years as long-range transport model
- Very commonly used throughout the world
- Now recommended as screening technique for PSD Increment beyond 50 km
  - Use AERMOD at 50 km
  - Consult with EPA Regional Office to determine next step (if necessary)
- EPA's rationale for demotion focused on “management” of CALPUFF
- Perhaps the most controversial of the proposed changes, met with widespread resistance

# *SO2 Data Requirement Rule*



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# SO2 Data Requirements Rule Overview

- 2010 SO2 NAAQS introduced 1-hr SO2 NAAQS
- EPA needs more data to make attainment determinations, thus this rule requiring States to provide required information
- States don't have resources to do this, so they're reaching out to industries
- Sources with more than 2000 tpy actual SO2 emissions are subject
  - States can also add in other sources (e.g., “cluster sources”)

# SO2 Data Requirements Rule

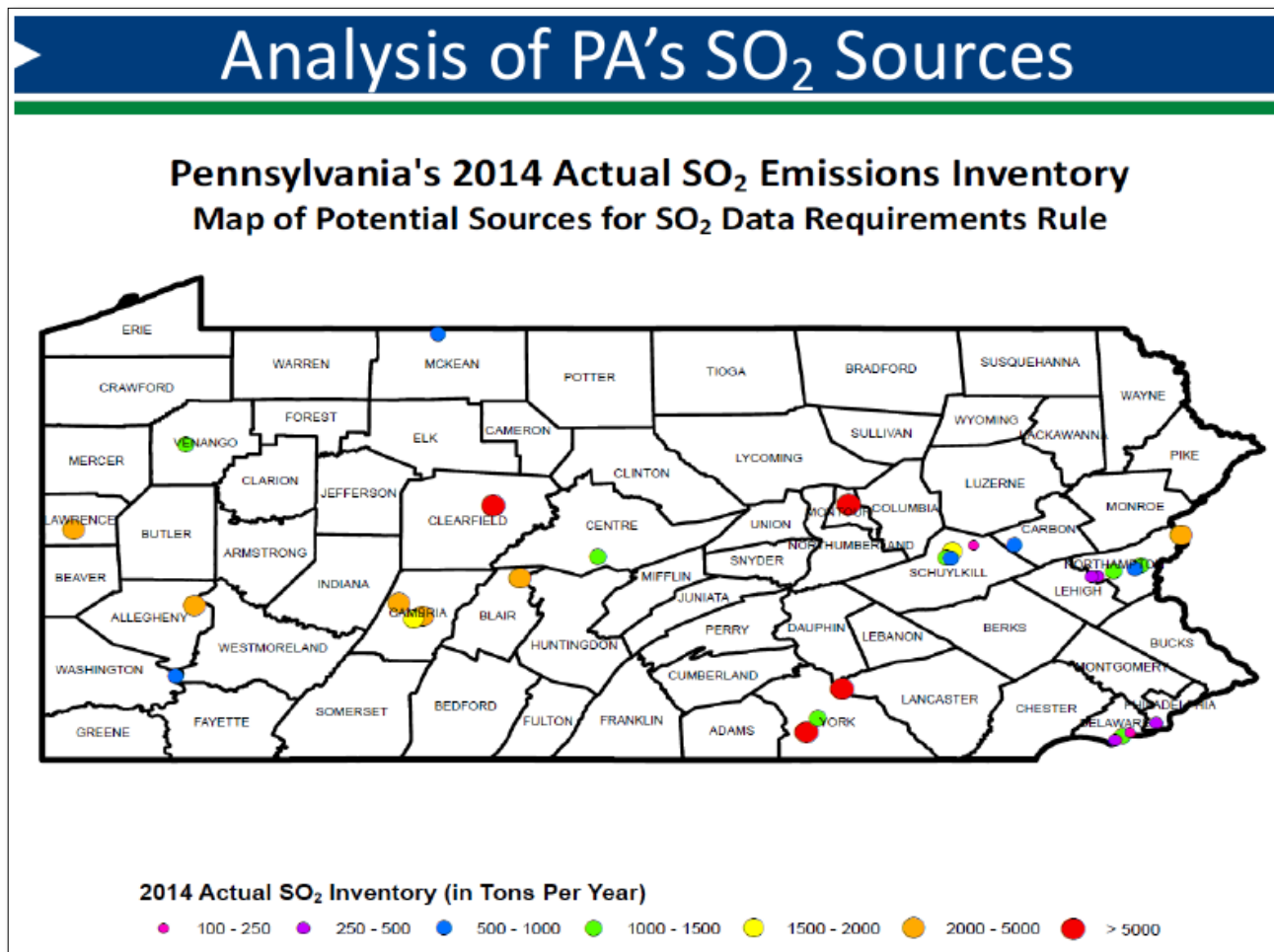
## Courses of Action Available

- Monitoring
  - Not favored because of timing
- Permit limit
  - Take permit limit to less than 2000 tpy
  - Unclear what limit would have to be for “cluster” source
- Modeling

# SO2 Data Requirements Rule Modeling Option

- July 1, 2016: States submit Protocols to EPA
- January 13, 2017: States submit final modeling analyses
- Different from “traditional” modeling analyses
  - Can use actual emissions
  - Address impacts only where monitors could be placed (e.g., not on water)
- Annual follow-up modeling may be required

# SO<sub>2</sub> Data Requirements Rule Pennsylvania



*In March 2016 EPA approved DEP's request to remove the following sources from this list:*

- American Refining Group (McKean County)*
- ArcelorMittal Monnessen (Westmoreland County)*
- Penn State (Centre County)*
- Scrubgrass Generating (Venango County)*

# SO2 Data Requirements Rule Pennsylvania

- DEP has been meeting over past few months with subject industries to discuss how they would like to proceed
- DEP leaning heavily toward modeling option
- DEP pressing for industries to explicitly model themselves and neighbors
- DEP considering acting as “repository” for emissions inventory and meteorological data



# Conclusions

- Changes to GAQM
  - Some subtle changes, some not
  - Trending toward more “case-by-case” analyses, which adds time and expense to permitting
- SO2 DRR
  - Responding to DRR falls to industries
  - Many industries will find it very challenging to demonstrate attainment
  - DEP will have many State Implementation Plans (SIPs) to work on
  - Industries should be proactive in preparing for SIPs

# Contact Information

Bill Jones

Osman Environmental Solutions, LLC

7251 Lake Hills Court, Marriottsville, Maryland 21104

410.794.6096

[billjones@osmanenvironmental.com](mailto:billjones@osmanenvironmental.com)

[www.osmanenvironmental.com](http://www.osmanenvironmental.com)



Osman Environmental Solutions