

Update on Revisions to Appendix W *Guideline on Air Quality Models*

2017 Missouri Air Compliance Seminar

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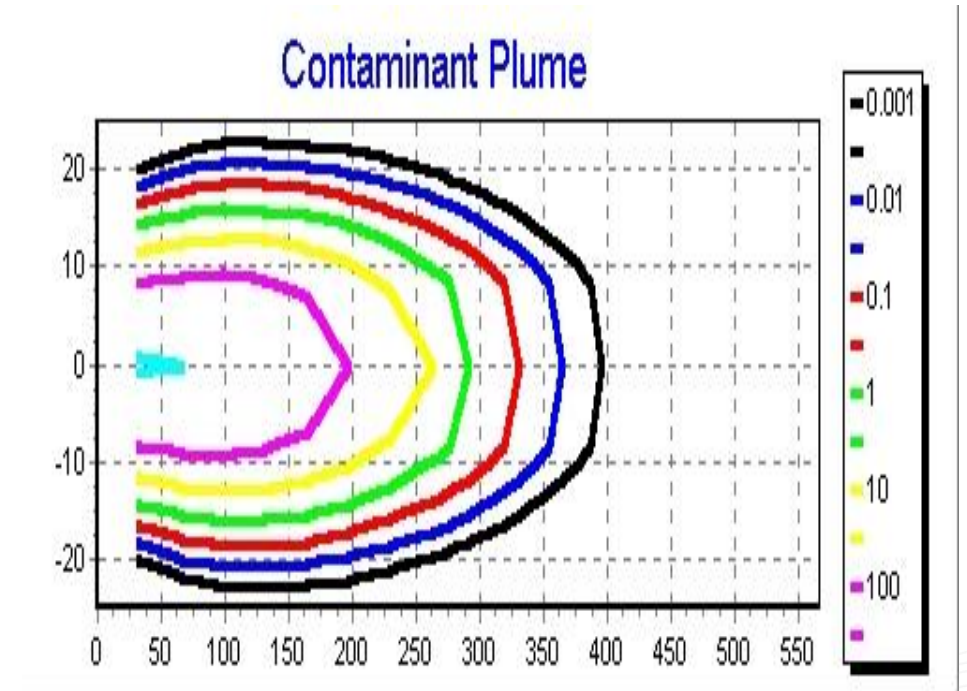
Introduction

- On December 20, 2016, the U.S. Environmental Protection Agency (EPA) finalized revisions to Appendix W, *Guideline on Air Quality Models*
- Changes include reorganization, clarifications and technical updates



AERMOD & AERMET Updates

- Enhancements to address technical concerns and improve model performance
 - ADJ_U* option in AERMET
 - LOWWIND3 option in AERMOD
 - Tall stack applications near small urban areas
 - Plume rise for horizontal and capped stacks
 - Incorporate algorithms from the Buoyant Line and Point Source (BLP) model
- Changes generally result in less conservative results, particularly in low wind speed conditions



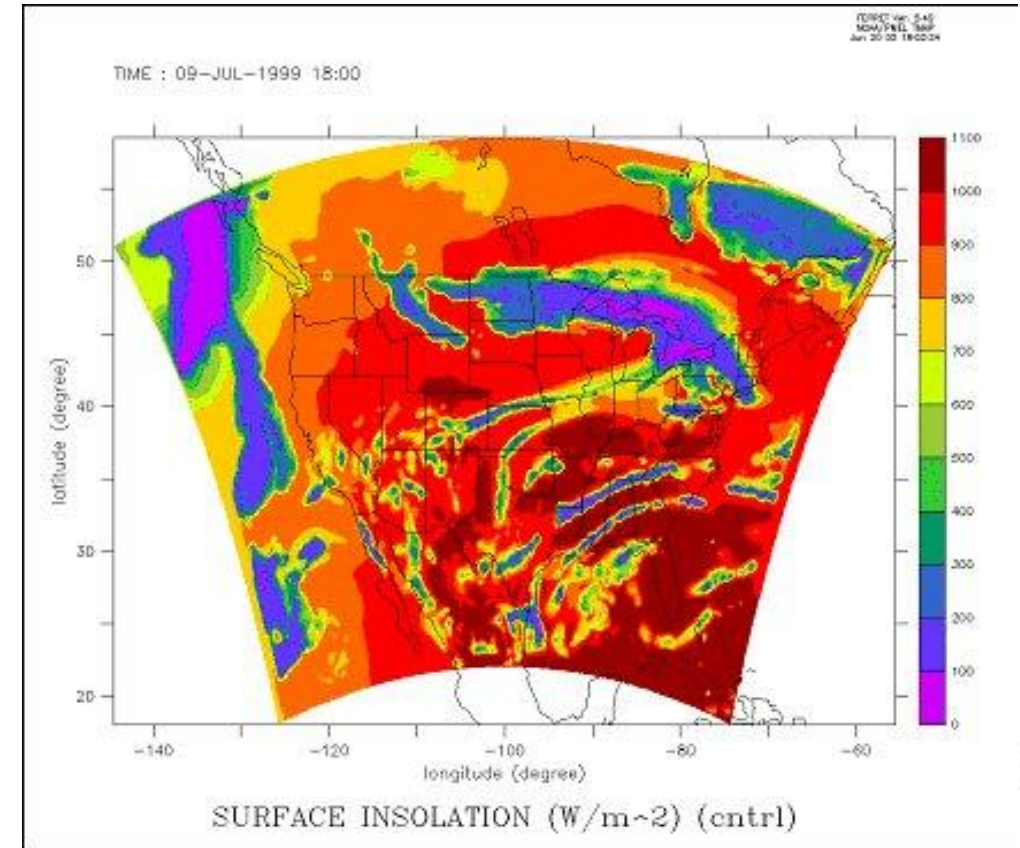
NO₂ Tier 2 and Tier 3 Screening Techniques

- Replace Ambient Ratio Method (ARM) Tier 2 option with revised ARM2 option
- Incorporate OLM and PVMRM as regulatory options in AERMOD as preferred Tier 3 screening methods for NO₂ modeling
 - Current PVMRM is old PVMRM2 Option – **this caused some confusion**
 - PVMRM best for isolated and elevated point sources
 - OLM best for groups of sources, area sources and near-surface releases (roadways)



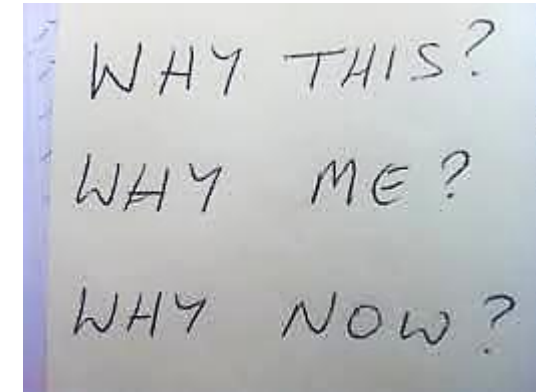
Meteorological Inputs

- Use of prognostic meteorological data in AERMOD where
 - No available National Weather Service (NWS) data
 - Not feasible to collect site-specific data
- Provides more flexibility and improves meteorological inputs used for regulatory modeling
- Most locations have representative NWS or on-site data



Single-Source Contribution to Ozone & PM_{2.5}

- EPA granted a petition from Sierra Club to establish models for ozone and PM_{2.5} for use in PSD permitting
- Primary PM and NO_x have historically been addressed in PSD permits, but secondary formation has become more important as NAAQS have become more stringent
- Advances in chemical transport modeling science make it possible to evaluate single-source contributions to secondary formation
- EPA issued separate guidance on single-source modeling



Single-Source Contribution to Ozone & PM_{2.5}

- Tier 1 – Existing technical information is available
 - Photochemical grid modeling
 - Published empirical estimates of source-specific impacts
 - Reduced-form models
- For Tier 1, data would be used in combination with other supportive information
- Tier 2 – Chemical transport models used to address single-source impacts



Figure 2. PM_{2.5} simulation result, annual average PM_{2.5} for 2002. Color scale is PM_{2.5} in µg m⁻³.

Wrap Up and Status

- Overall, AERMOD and AERMET revisions reflect the latest science and reduce conservancy of the modeling system
- In response to the President's "Regulatory Freeze Pending Review" memorandum (January 20, 2017), EPA issued a rule extending effective date to March 21, 2017
- Changes must be integrated into regulatory processes by January 17, 2018 (one year following *Federal Register* publication date)
- Not aware of additional revisions to Appendix W as a result of the federal regulatory review process

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