AERMOD Release v.21112

EPA RSL Workshop

U.S. EPA / OAQPS / Air Quality Modeling Group

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Clint Tillerson (US EPA)

AERMOD v.21112 – Release Summary

- Version 21112 (April 22, 2021) - AERMOD, AERMET, AERSCREEN
- Posted to SCRAM on Tuesday, May 11, 2021
  - https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod
- Release Webinar, Monday, May 24, 2021
  - https://gaftp.epa.gov/Air/aqmg/SCRAM/webinars/AERMOD_21112/AERMOD_21112_Release_Webinar.pdf
- Possibly the largest update to AERMOD with respect to volume of new code development and number of code developers
  - A&WMA PRIME2 Subcommittee – **alpha** options for building downwash (AWMAUTURBHX, AWMAENTRAIN)
  - AECOM – **alpha** NO2 conversion option - TTRM
  - CERC –**alpha** NO2 conversion option - GRSM
  - EPA ORD – 2-barrier **alpha** option for RLINEXT source type
  - EPA AQMG (via Wood) – Multiple buoyant line group
  - EPA AQMG – Turbulence options
  - EPA AQMG – Default deposition parameters (select pollutants)
- Bug Fixes - AERMOD, AERMET, AERSCREEN

AERMOD v.21112 – Interim Bug Resolutions

- Two confirmed coding bugs reported specific to AERMOD v.21112
  - NO2 Background (PVMRM Only)
    - NO_2 background values are added twice to generate final modeled concentrations
    - **Only affects Tier 3 NO_2 Plume Volume Molar Ratio Method (PVMRM) conversion option**
    - Does not affect other NO_2 options (e.g., ARM2, OLM, TTRM, GRSM)
    - Does not affect NO_X chemistry
    - **Interim Solution – enter one-half (1/2) of the actual NO_2 background value ONLY when using PVMRM**
  - Buoyant Lines (BUOYLINE)
    - AERMOD appears to run successfully when both BLPGROUP and BLPINPUT keywords are missing from the AERMOD input control file
    - Generates zero concentrations for BUOYLINE sources
    - **Interim Solution – include BLPINPUT and BLPGROUP keywords in the AERMOD input control file**

AERMOD v.21112 – Interim Bug Resolutions

- **Modeling NO2 Background Concentrations with PVMRM**

  A coding bug was discovered in AERMOD v21112 when providing background concentrations of NO_2 when using the Tier 3 Plume Volume Molar Ratio Method (PVMRM) for NO_2 conversion. In this case, the background concentrations of NO_2 provided via the AERMOD input control file are added to the intermediate modeled concentrations twice, resulting in final modeled concentrations that are too high. When using the PVMRM option to model NO_2 concentrations, users should input background concentrations of NO_2 that are one-half of the amount of the actual background concentration.

  Please note, this bug does not affect any of the other NO_2 conversion options (*i.e.*, ARM2, OLM, GRSM, or TTRM). Actual NO_2 background concentrations should be entered when using ARM2, OLM, GSRM, or TTRM.

- **Modeling BUOYLINE Source Types**

  A coding bug was discovered in AERMOD v21112 related to error handling which in some circumstances AERMOD will complete processing without an error but concentrations for BUOYLINE source types will not be generated or reported as zero. This can occur when one or more BUOYLINE sources are defined and the required BLPINPUT keyword is omitted, as well as the BLPGROUP keyword (not required in all circumstances). When all BUOYLINE source types defined in the input control file are considered part of a single BLPGROUP, the BLPGROUP keyword is not required, and the BLPGrpID is an optional parameter for the BLPINPUT keyword. However, the BLPINPUT keyword is required. If the BLPINPUT keyword is also omitted, AERMOD will appear to complete successfully, but concentrations will not be generated for the BUOYLINE source types since the BUOYLINE source characteristics have not been specified via the BLPINPUT keyword and parameters. When modeling BUOYLINE source types, EPA recommends that the user include the BLPGrpID with the BLPINPUT keyword even when all BUOYLINE source types are modeled as a single BLPGROUP and assign each BUOYLINE source type to a BLPGROUP via the BLPGrpID parameter with the BLPGROUP keyword.