FACT SHEET

REVISION TO THE *GUIDELINE ON AIR QUALITY MODELS*: ENHANCEMENTS TO THE AERMOD DISPERSION MODELING SYSTEM AND INCORPORATION OF APPROACHES TO ADDRESS OZONE AND FINE PARTICULATE MATTER

ACTION

- On December 20, 2016, the Environmental Protection Agency (EPA) finalized several additions and changes to its *Guideline on Air Quality Models* (*Guideline*). The *Guideline* is used by the EPA, states, tribes, and industry to prepare and review permits for new sources of air pollution. State and tribal air agencies also use the *Guideline* to revise their plans detailing strategies for reducing emissions and improving air quality known as State or Tribal Implementation Plans.

- The EPA is finalizing enhancements to the scientific formulation of the preferred near-field (up to 50km from an emission source) dispersion model, AERMOD, to address technical concerns expressed by the stakeholder community and improve model performance in its regulatory applications.

- This final action also will streamline resources necessary to conduct regulatory modeling with AERMOD by incorporating model algorithms from the Buoyant Line and Point Source (BLP) model and updating methods that address NO_2 chemistry.

- This action also replaces the model known as CALINE3 with AERMOD for refined mobile source applications including fine particle pollution ($PM_{2.5}$, PM_{10}), and carbon monoxide (CO) hot-spot analyses. The transition period for the use of AERMOD for these refined modeling applications was extended to 3 years and the use of CAL3QHC for CO screening analyses was retained.

- To provide more flexibility and improve the meteorological inputs used for regulatory modeling, the EPA is finalizing the use of projected meteorological data in AERMOD where there is no representative National Weather Service (NWS) station and it is prohibitive or not feasible to collect adequately representative site-specific data.

- The EPA is finalizing modeling techniques to address the secondary chemical formation of fine particle and ozone pollution from direct, single source emissions of sulfur dioxide, oxides of nitrogen for fine particle formation, and volatile organic compounds and oxides of nitrogen for ozone formation. These compounds can react in the atmosphere to form fine particle and ozone pollution.

- In conjunction with the final *Guideline*, the EPA is issuing guidance on single-source modeling, "Guidance on the Use of Models for Assessing the Impacts of Emissions from Single Sources on the Secondarily Formed Pollutants Ozone and $PM_{2.5}$."

- For long-range, beyond 50km from an emissions source, air quality assessments, the EPA is removing CALPUFF as a preferred model and now will consider it as a screening technique, along with other Lagrangian models, to be used in consultation with the appropriate reviewing authority.

- The EPA expects these model enhancements and *Guideline* revisions will increase the efficiency and accuracy of regulatory modeling demonstrations.

BACKGROUND

- The Clean Air Act requires the EPA to standardize air quality modeling procedures.

- EPA originally published the *Guideline on Air Quality Models* in 1978 and revised it several times since then. The latest revision occurred in November 2005.

- EPA developed the *Guideline* to help EPA, states, and industry prepare and review new source permits and "State or Tribal Implementation Plan" revisions. The *Guideline* is important because it specifies models for regulatory application and provides guidance for their use. The *Guideline* provides a common basis for estimating the air quality concentrations of criteria pollutants used in assessing control strategies and developing emissions limits.

- Based on other studies presented and discussed at the Tenth Modeling Conference in March 2012, and additional relevant research since 2010, the EPA and other researchers have conducted additional model evaluations and developed changes to the model formulation of the AERMOD Modeling System to improve model performance in its regulatory applications. The updates to the AERMOD Modeling System were to address a number of the technical concerns expressed by stakeholders.

- On January 4, 2012, the EPA granted a petition submitted on behalf of the Sierra Club on July 28, 2010, that requested the EPA to establish air quality models for ozone and $PM_{2.5}$ for use by all major sources applying for a pre-construction Prevention of Significant Deterioration permit. In granting that petition, the EPA committed to engage in rulemaking to evaluate whether updates to the *Guideline* are warranted and, as appropriate, incorporate new analytical techniques or models for ozone and secondarily formed $PM_{2.5}$. As a part of this commitment and in compliance with section 320 of the Clean Air Act, the EPA conducted the Tenth Conference on Air Quality Modeling in March 2012 where there were presentations of ongoing research of single-source plume chemistry and photochemical grid modeling techniques, as well as several public forums. The EPA subsequently received written comments pertaining to such modeling.

- The EPA initiated Phase 3 of the Interagency Workgroup on Air Quality Modeling process in June 2013 to inform the update to the *Guideline* to address chemically reactive pollutants for near field and long-range transport applications. Comments received from stakeholders at the Tenth Conference on Air Quality Modeling supported this collaborative effort to provide additional guidance for modeling single-source impacts of secondarily formed pollutants in

the near-field and for long-range transport. Stakeholder comments also supported the idea of this collaborative effort occurring in parallel with stakeholders' efforts to further model development and evaluation. The EPA's recommended revisions to the *Guideline* related to addressing single-source ozone and secondary $PM_{2.5}$ impacts are largely based on detailed review and assessment of this input.

FOR MORE INFORMATION

- Additional technical information, including a copy of the Guideline and a fact sheet, are available on EPA's regulatory atmospheric modeling website at https://www.epa.gov/scram.

- Information is also available through the Federal eRulemaking Portal at http://www.regulations.gov under the Docket identification number EPA-HQ-OAR-2015-0310.

- For further information about this action, contact George Bridgers of EPA's Office of Air Quality Planning and Standards at (919) 541-5563 or bridgers.george@epa.gov.