



At a Glance

Why We Did This Project

We conducted this audit to assess the effectiveness of the U.S. Environmental Protection Agency's (EPA's) process for reviewing and approving air quality dispersion models it recommends for use by state, local and tribal air pollution control agencies.

Air quality dispersion models predict the air quality impact of pollutants released into the atmosphere. The EPA's review and approval process for designating preferred models is outlined in Appendix W of 40 CFR Part 51. The goal of this process is to identify the best-performing model as the preferred model, and the appendix lists preferred models. Appendix W was originally promulgated in 1978 and most recently revised in 2017. The American Meteorological Society/EPA Regulatory Model (AERMOD) is the EPA preferred model for most regulatory uses listed in Appendix W. AERMOD predicts the air quality impact of pollutants from sources up to 50 kilometers downwind, and was first designated as a preferred model in the 2005 revision of Appendix W.

This report addresses the following:

- *Improving air quality.*

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EPA Can Strengthen Its Process for Revising Air Quality Dispersion Models that Predict Impact of Pollutant Emissions

What We Found

Although the agency has prepared guidance on the recommended procedures for reviewing the development and evaluation of new air quality dispersion models, similar guidance is not available for model revisions. The development of standard operating procedures (SOPs) and quality assurance project plans (QAPPs) or equivalent documents for model revisions could assure consistent application of quality assurance and quality control activities.

Air quality estimates derived from air quality dispersion models are used to make important decisions to protect public health, such as setting emissions limits.

From 2006 through 2016, the EPA issued 12 Model Change Bulletins revising AERMOD with enhancements, bug fixes and/or miscellaneous changes to improve the model. The 12th Model Change Bulletin was associated with the 2017 Appendix W revisions that included adding new regulatory uses to AERMOD. However, the quality assurance and control activities undertaken for these revisions were not as extensive as what EPA guidance recommends for new model development and evaluation. For example, the agency used peer-reviewed journal articles to satisfy peer-review requirements, while AERMOD received a panel peer review when it was developed. In one instance, the agency proposed a new regulatory option for AERMOD, which lacked peer-review literature and later needed additional evaluation. Development of SOPs, as well as QAPPs or equivalent documents, could assure that consistent and appropriate quality control and assurance activities are conducted when revising preferred models by helping assure that the predicted results are of sufficient quality. This is especially important because AERMOD is used by all 50 states, as well as tribes and territories, to predict air quality impacts for regulatory purposes under the Clean Air Act.

Recommendations and Planned Agency Corrective Actions

We made four recommendations to the Assistant Administrator for Air and Radiation. These recommendations involved developing SOPs to guide and document its process for reviewing and approving revisions to preferred air quality dispersion models, developing QAPPs or equivalent documents to describe results of systematic planning for air quality dispersion model revisions, updating the Office of Air Quality Planning and Standards' Quality Management Plan, and training staff. The agency agreed with our recommendations and provided acceptable corrective actions.