

US EPA ARCHIVE DOCUMENT

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Parts 51 and 52**

[AH-FRL-3820-7, Docket No. A-88-04]

RIN 2060-AC43

Requirements for Preparation, Adoption, and Submittal of Implementation Plans**AGENCY:** U.S. Environmental Protection Agency (EPA).**ACTION:** Notice of proposed rulemaking.

SUMMARY: The "Guideline on Air Quality Models (Revised)", EPA-450/2-78-027R (1986), and supplement A (1987), hereinafter referred to as the "Guideline", list air quality models for estimating ambient air concentrations due to sources of air pollutants. The Guideline is presently incorporated by reference into the prevention of significant deterioration (PSD) regulations under the Clean Air Act at 40 CFR 51.166 and 52.21. EPA here proposes to augment that Guideline with several new modeling techniques. The purpose is to provide models for situations where specific procedures were not previously available and to improve several previously adopted techniques. In addition, revisions are proposed that make the guidance and model requirements consistent with regulatory programs that have been formalized or changed since the last major Guideline revision in 1986 (51 FR 32176). EPA is proposing to establish these additions and changes as supplement B to the Guideline. EPA is also proposing to amend 40 CFR 51.166 and 52.21 to incorporate supplement B, and to amend 40 CFR 51.46, 51.63, 51.112, 51.117, 51.150, and 51.160 to codify the Guideline as the basis by which air quality models are to be used for demonstrations associated with SIP (State Implementation Plan) revisions, AQMA (Air Quality Maintenance Area) analyses, regional classifications for episode planning, and new source review¹ in general (not just PSD). The proposal, in part, is based on public comments received at the Fourth Conference on Air Quality Modeling, the purpose of which was to advise the public on these new techniques and to facilitate further technical review. Adoption of the new modeling techniques should significantly improve the technical basis for impact assessment of air pollution sources.

DATES: A public hearing on the proposed

changes will be held March 19, 1991 (Tuesday), from 9 a.m. to 5 p.m. As needed to allow for presentation of all verbal comments, the hearing may be extended to noon of the next day. The period for comment on these proposed changes closes May 6, 1991.

ADDRESSES: Comments: Written comments should be submitted (in duplicate if possible) to: Air Docket (LE-131), room M-1500, Waterside Mall, attention: Docket A-88-04, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460 (also see "Public Hearing").

Copies of supplement B (draft) to the "Guideline on Air Quality Models (Revised)" may be obtained by writing or calling Joseph A. Tikvart, Source Receptor Analysis Branch, MD-14, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, phone (919) 541-5561. Supplement B (draft) is also available to registered users of the Support Center for Regulatory Air Models Bulletin Board System by downloading the appropriate file. To register or access this electronic bulletin board, users with a personal computer should dial (919) 541-5742.

Public Hearing: GSA Auditorium, GSA National Capitol Region Building, 7th and D Streets SW., Washington, DC.

Docket: Copies of reports referenced herein, public statements and comments made in relation to the Fourth Conference on Air Quality Modeling, and public comments made on this Notice of proposed rulemaking are maintained at Docket A-88-04. The docket is available for public inspection and copying between 8 a.m. and 4 p.m., Monday through Friday, at the address above. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Joseph A. Tikvart, Chief, Source Receptor Analysis Branch, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency; Research Triangle Park, NC 27711; telephone (919) 541-5561 or (FTS) 629-5561.

SUPPLEMENTARY INFORMATION:**Background**

The "Guideline on Air Quality Models" ("Guideline") was originally published in April 1978. It was incorporated by reference in the regulations for the Prevention of Significant Deterioration of Air Quality in June 1978 (43 FR 26380). The purpose of the Guideline is to promote consistency in the use of modeling within the air management process. Such consistency is fostered by sections 110(a)(2), 165(e), 172 (a) and (b), 173,

301(a)(1) and 320 of the 1977 Clean Air Act Amendments,² 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) and (b), 7503, 7601(a)(1) and 7620, respectively. The Guideline provides model users with a common basis for estimating pollution concentrations, assessing control strategies and specifying emission limits.

In December 1984, EPA proposed revising the Guideline to incorporate knowledge concerning modeling analyses that had been developed since the original guidance was issued. Final revisions to the Guideline were promulgated in September 1986 (51 FR 32176) and, as a result of public comment, changes concerning four additional modeling techniques were simultaneously proposed. They were: (1) addition of a specific version of the Rough Terrain Diffusion Model (RTDM), (2) modification of the downwash algorithm in the Industrial Source Complex (ISC) model, (3) addition to the Offshore and Coastal Dispersion (OCD) model to EPA's list of preferred models, and (4) addition of the AVACTA II model as an alternative model in the Guideline. In January 1988, EPA promulgated the four techniques as Supplement A to the Guideline (53 FR 392). The "Guideline on Air Quality Models (Revised)" (1986) and supplement A (1987) have been incorporated by reference into the PSD regulations at 40 CFR 51.166 and 52.21.

Codification of the Guideline in 40 CFR parts 51 and 52 has heretofore been for purposes of compliance with PSD regulations. However, as stated in the Introduction, the Guideline describes "air quality modeling techniques that should be applied to State Implementation Plan (SIP) revisions for existing sources and to new source review * * *", and this has always been EPA policy. Use of air quality models for such purposes is required at 51.112 (Demonstration of Adequacy) and at 51.117 (Additional Provisions for Lead). Use of air quality models is also required: For Air Quality Maintenance Area (AQMA) analyses at 51.46 (Projection of Air Quality Concentrations); for classification of regions for episode plans at 51.150 (Prevention of Air Pollution Emergency Episodes); and for new source review at

² On November 15, 1990, the Clean Air Act Amendments of 1990 ("Amendments"), Public Law 101-549, were enacted. As amended, the Clean Air Act provides continued authority for the revisions to the Guideline and the Code of Federal Regulations contained in this proposal. That authority includes but is not limited to, the following provisions, some of which may have been modified by the Amendments: Clean Air Act sections 110(a)(2), 165(e), 172 (a) and (c), 173, 301(a), and 320.

¹ New source review includes that of modified sources.

51.160 (Review of New Sources and Modifications). EPA believes that its proposed incorporation by reference of the Guideline into these provisions is consistent with the authority granted by sections 110(a)(2), 165(e), 172 (a) and (b), 173, 301(a)(1) and 320 of the 1977 Clean Air Act Amendments (see footnote 2), 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) and (b), 7503, 7601(a)(1) and 7620, respectively.

To support the process of developing and revising the Guideline during the period 1977-1988, the First, Second and Third Conferences on Air Quality Modeling were held as required by section 320 of the Clean Air Act to help standardize modeling procedures. These modeling conferences provided EPA with comments on the Guideline and associated revisions, thereby facilitating introduction of improved modeling techniques into the regulatory process.

In October 1988, the Fourth Conference on Air Quality Modeling was held. Its purpose was to advise the public on new modeling techniques and to solicit comments to guide EPA's consideration of any rulemaking needed to further revise the Guideline. The new models provide techniques for situations where specific procedures had not previously been available, and also improve several previously adopted techniques. These new techniques and the guidance discussed at the modeling conference are:

- Complex Terrain Dispersion Model, Ozone precursor point source modeling,
- Mobile source modeling at signalized intersections,
- Emissions and dispersion modeling system for airports,
- Long-range transport models,
- Models for estimating visibility impact of specific sources,
- Model for shoreline dispersion,
- Valley stagnation,
- On-site meteorological program guidance,
- Method for evaluating models,
- General screening techniques,
- Regional scale models,
- Modeling techniques for air pathway analyses.

In general, EPA solicited comments on (1) whether the techniques are sound, (2) whether they should be adopted for regulatory application, and (3) whether limitations on use, including data base requirements, should be specified.

All comments presented at the fourth modeling conference and/or submitted to Docket A-88-04 are encompassed in Docket Items II-D, II-E, and II-G. Also, a verbatim transcript of the conference proceedings is available as Docket Item

II-G-3a and b. EPA has summarized these comments, developed responses, and drawn conclusions on appropriate actions for this Notice of Proposed Rulemaking in the document "Summary of Public Comments and EPA Responses on the Fourth Conference on Air Quality Modeling—October 1988" (Docket Item II-O-1).

The following are hereby proposed as models or analysis procedures recommended for inclusion in the Guideline: Complex Terrain Dispersion Model (refined model, accompanied by CTSCREEN and modifications in the use of other screening models); CAL3QHC (carbon monoxide estimates at signalized intersections); modeling for air pathway analysis of toxic/hazardous pollutants (consistent multimedia use of ISC and other models); EDMS (modeling system for airports); on-site meteorological program guidance (expansion of current guidance); general screening techniques and VISCREEN (updates and computerization of current screening techniques); method for evaluating models (enhancement of current guidance). For the most part, these models and analysis procedures are designed for operation on or to be compatible with a personal computer.

The following are being proposed for addition to Appendix B of the Guideline with an indication that they are available for application in the unique circumstances to which they apply on a case-by-case basis: Shoreline Dispersion Model (sea/lake breeze fumigation) and WYNDvalley (valley stagnation). Two models falling in a similar category that are already in appendix B are: MESOPUFF-II (long-range transport) and PLUVUE-II (visibility).

Besides adding new techniques, EPA is also proposing to clarify and update portions of the Guideline to make it consistent with current regulatory programs that have been established through other Agency activities.

Specified proposed actions on models, analysis procedures, and Guidelines modifications are discussed in the following section. Codes, user's guides, and other documents or guidance pertinent to specific modeling techniques are identified as individual Docket Items. These models and other changes will be adopted in the Guidelines on Air Quality Models (Revised) through supplement B (Draft) (Docket Item III-B-1); see the ADDRESSES Section of this notice for general availability. Of the techniques considered at the fourth modeling conference, only two are not being proposed for further action at this time; they are point source modeling for ozone precursors and regional scale models.

Proposed Action

A. Complex Terrain Models

1. Refined Model

The Complex Terrain Dispersion Model (CTDM) (Docket Item II-I-1b) is the result of a major development and evaluation effort. It should fill a significant void in the Guideline by providing a refined technique for determining pollutant concentrations due to plume impingement on the windward side of terrain features during stable and neutral atmospheric conditions. Public comments generally support EPA's view that the model is technically sound, represents the best theoretical approach, and should be adopted for regulatory application as a refined model.

One concern had been the ability to estimate concentrations during unstable conditions. Public comments discussed several ways of coping with this matter, but in the meantime, EPA has elected to deal directly with the problem by augmenting CTDM with a module for unstable conditions based on current scientific theory. The new model is known as CTDMPLUS and has undergone sensitivity analysis and evaluation (Docket Items II-I-30, II-I-31). The user's guide documenting the scientific assumptions, input and operating requirements, model options and defaults, and the code is available as EPA-600/8-89/041 (NTIS No. PB 89-181424).

Other concerns related to limitations of the model or its data base requirements. Based on those comments, EPA is limiting application of CTDMPLUS to the windward side of terrain features and makes no attempt at this time to recommend techniques for lee side effects or other complex terrain phenomena. However, CTDMPLUS is applicable to all terrain receptors above stack height; thus, for applications of this model the "intermediate-terrain" problem that has bothered many users of complex terrain models is eliminated. (Other regulatory models in the Guideline are currently recommended for receptors at or below stack height).

With regard to data base requirements, commenters would like these to be set forth as specifically as possible. However, due to the intense data requirements of the model (Docket Items II-I-10-d) and limited experience with its use for regulatory applications, these specifications must remain somewhat general in the Guideline. Meteorological inputs to CTDMPLUS should be based on multi-level wind speed and direction data obtained up to

representative plume height; SODAR data may be appropriate. Direct turbulence measurements and vertical potential temperature gradient should be obtained for at least three measurement levels with the topmost level as close to plume height as practical; generally, data up to 150m above stack base on an instrumented tower should be adequate. Elements of the on-site meteorological measurement program, and development of a receptor network, should be developed on a case-by-case basis with the concurrence of the EPA Regional Office.

2. Screening Techniques

EPA has also received varied comment on the advisability of establishing a screening technique derived from CTDM; such a model would have a better scientific basis than currently available screening techniques. Some commenters recognize the desirability of such a technique, while others express concerns about the actual need and difficulty of establishing a standard set of meteorological conditions for the screening technique. EPA has elected a screening technique entitled CTSCREEN, EPA-600/8-90/XXX (Docket Item II-J-7). This technique is essentially CTDMPLUS with a predetermined range of meteorological conditions that are thought to bracket the highest concentrations for most source-terrain configurations. The preparation of this technique is justified by the improved scientific basis derived from the CTDMPLUS code. It will be allowed as an alternate screening technique.

3. Sensitivity Analysis

Adoption of a new model can affect the design concentrations on which emission limits are based, thus, sensitivity analyses for CTDMPLUS as a refined model were conducted (Docket Item II-I-28a-1). These analyses compared design concentrations from CTDMPLUS to those from available complex terrain screening techniques for a variety of source-terrain configurations. The expectation was that the screening techniques would provide generally higher design concentrations than CTDMPLUS; by intent, the screening techniques should be more conservative than this refined technique which has also been established as the most accurate of all complex terrain techniques considered (Docket Item II-I-2 and II-I-3). This expectation was satisfied in most cases so that CTDMPLUS provides less stringent and more appropriate emission limitations than previously possible with the conservative screening techniques in

use. The degree of conservatism, though, among the screening models was not always consistent within the present hierarchical structure of such techniques. The addition of CTSCREEN further complicates the situation and, in combination with findings of the sensitivity analyses, places in doubt the merits of such a hierarchical structure. Thus, the structure will be dropped so that any acceptable screening technique may be used consistent with the needs, resources, and available data of the user.

In a few cases, the screening techniques (RTDM more so than other models) have the potential to provide less stringent design concentrations than does CTDMPLUS and may not be acting effectively as conservative screening techniques. However, for several reasons the limited findings cited here are not thought to be a significant enough matter to justify any further changes in the use of these models. For instance: (1) Recent evaluations with the current version of RTDM-default show the model to provide conservative estimates compared to measured data; (2) the experience with CTDMPLUS in relation to screening models is insufficient to draw conclusions with any confidence; (3) the extent to which RTDM might underestimate concentrations is not unequivocally delineated in the various analyses; (4) estimates lower than those of CTDMPLUS occasionally occur with other screening models, although rarely; and (5) since RTDM is the most refined of the screening models, it is expected to provide the most realistic of the conservative estimates and occasional crossover to lower estimates than those derived from CTDMPLUS might not indicate significant inaccuracy. Nevertheless, screening models should generally function as conservative estimators of ambient concentrations, and EPA seeks public comment on limited exceptions like those noted here. As additional information becomes available and experience with CTDMPLUS is gained over the next few years, it may be necessary to further consider this matter.

4. Conclusion

EPA is proposing to identify CTDMPLUS in chapter 5 of the Guideline as a recommended refined model for complex terrain with a minimum set of requirements for data used in the model. More detailed elements of the meteorological measurement program and the selection of receptor sites are to be developed on a case-by-case basis with concurrence of the EPA Regional Office. The model

will be included in appendix A of the Guideline. CTSCREEN will be added as an acceptable technique in chapter 5. The hierarchical structure of acceptable screening techniques is proposed to be dropped, allowing discretion of the user and the EPA Regional Office or reviewing authority as to which technique is most useful for a given application.

B. Mobile Source Modeling at Signalized Intersections

Public comment indicates concern that current guidance on modeling carbon monoxide concentrations for intersections (Worksheet 2 of the "Guideline for Air Quality Maintenance Planning and Analysis", Volume 9, EPA-450/4-75-001) is difficult to use, outdated, and cannot adequately model over-capacity situations. In response, EPA developed a program to review traffic and emissions components of intersection models and has consulted with the Federal Highway Administration (FHWA) on such analyses. A plan for conducting these analyses and developing an improved intersection model was presented at the fourth modeling conference. Public comments supported the need for an improved modeling technique and more specifically the program that EPA proposed.

As a result of this program, EPA has completed development of the CAL3QHC intersection model which has improved traffic and emissions components; it incorporates CALINE3 which is the recommended Guideline dispersion model for roadway sources. Documentation for the code and user's guide is available as Docket Item II-J-8. CAL3QHC and a related screening technique appear to be suitable to replace Worksheet 2 for refined analyses and the Hot Spot Guidelines for screening analyses in estimating CO concentrations. Since this is the first public view of the complete model, no restrictions on use were identified in the public comments other than restrictions to roadways at intersections. EPA has also prepared "Guideline for Modeling Carbon Monoxide from Roadway Intersections" (Docket Item II-J-9) and solicits comments regarding it.

Performance evaluation of CAL3QHC (Docket Item II-I-32) indicates that this is among the most accurate of several models tested for signalized intersections. A sensitivity analysis (Docket Item II-I-29) was also performed to determine the impact of CAL3QHC on design concentrations relative to the other available techniques. Contrary to expectations, it

was found that CAL3QHC produced higher estimates and the need for more stringent controls than did Worksheet 2 and some other techniques for the intersection scenarios considered. This indicates that EPA's existing guidance on modeling for roadway intersections up until this time may tend to lead to underestimates of highest ambient concentrations.

Conclusion: EPA is proposing to include CAL3QHC and a related screening technique as the recommended models for roadway intersections in Section 6.2 of the Guideline. They would replace Worksheet 2 for refined analyses and the Hot Spot Guidelines for screening analyses. CALINE3 remains the recommended dispersion model in appendix A for roadways.

C. Emissions and Dispersion Modeling System for Airports

The Federal Aviation Administration and the U.S. Air Force have jointly developed the Emissions and Dispersion Modeling System (EDMS) to provide an integrated assessment of pollution from multiple sources (e.g., aircraft, motor vehicles, and power plants) at airports and air bases. These agencies have requested that EPA adopt this modeling system to fill the void in the Guideline which does not contain any models or recommendations oriented specifically to these operations. While the emissions components of EDMS are a unique new application, the dispersion components are consistent with models already recommended in the Guideline and contained in appendix A. A user's guide and code for the EDMS model are contained in Docket Item II-I-8.

The public comments on this model were mixed and appeared to confuse the identified model with an earlier version. Nevertheless, given the apparent need for such a model and the fact that dispersion components are consistent with techniques already recommended in the Guideline, EPA believes that EDMS should be considered for inclusion in appendix A of the Guideline. However, it is appropriate to restrict the regulatory application of EDMS to those impact assessments which contain or have as a major focus changes in aircraft operations which will result in a significant change in emission and pollutant concentration patterns. For example, if a combustion unit at an airport requires a PSD permit by itself, independent of aircraft operations or mobile source peripheral to, but off airport property, then a model recommended in the Guideline for these specific applications should be used in such an analysis.

Conclusion: EPA is proposing to include EDMS as the recommended model for, but limited to, airport operations as identified in section 7.2.8 of the Guideline. The model will be included in appendix A of the Guideline.

D. Modeling for Air Pathway Analyses

At the fourth modeling conference, EPA sought comment on techniques for developing air pathway analyses of toxic and hazardous waste pollutants. Modeling for these pollutants is done across a number of the EPA offices with varying levels of detail in the analysis performed. While the public comments did not give as much attention to this matter as had been expected, there was general support for uniform modeling guidance and standardized models both through direct availability of models and through improved guidance in specific areas. The comments have already been satisfied in part, since ISC is the model that serves as the basis for most air pathway analyses of continuous pollutant emissions. In addition, the "Workbook of Screening Techniques for Assessing Impacts of Toxic Air Pollutants", EPA-450/4-88-009 (NTIS No. PB 89-134340) provides the basis for obtaining preliminary estimates of short-term concentrations due to a wide range of toxic/hazardous pollutant release scenarios. Also, DEGADIS 2.1 is available as a refined model for treating releases of heavier-than-air gases over time periods of limited duration, EPA-450/4-89-019 (NTIS No. PB 90-213893).

Conclusion: EPA proposes to amend sections of the Guideline appropriate to air toxics to discuss several items. For instance, the ISC model will be identified in section 7.2.7 and in appendix A as the recommended air quality model for analyses of toxics/hazardous pollutants, especially those that involve continuous releases. Screening techniques contained in the "Workbook of Screening Techniques for Assessing Impacts of Toxic Air Pollutants" will be identified as available for air toxics analyses. References in section 12 will be expanded to identify guidance developed by other EPA programs which, in general, heavily rely on the ISC model, and to provide more information on toxic chemical properties. In addition, DEGADIS 2.1 will be added to appendix B as a refined model for dense gases that may be used, as appropriate, on a case-by-case basis.

E. On-Site Meteorological Program Guidance

The use of on-site meteorological data to support air quality impact analyses has grown steadily over recent years.

EPA has published a document titled "On-site Meteorological Program Guidance for Regulatory Modeling Applications", EPA-450/4-87-013 (Docket Item II-I-17). The purpose of this document is to supplement the limited guidance on this subject currently in chapter 9 of the Guideline. It also consolidates into a single document specific guidance on the collection and use of on-site meteorological data for air quality modeling analyses. This document had undergone extensive external peer review by State agencies, meteorological instrument manufacturers, and other Federal agencies prior to the fourth modeling conference.

Also, in response to the need for consistency in the processing of on-site meteorological data, EPA has developed a Meteorological Processor for Regulatory Models (MPRM), EPA-600/3-88/043 (Docket Item II-I-18). This computer algorithm is designed to process on-site meteorological data following the procedures recommended in the on-site meteorological program guidance document, and produces output necessary to run the EPA regulatory dispersion models. It is designed to provide considerable flexibility to users in terms of input data formats, and may be easily expanded to accommodate the data requirements of future models.

Public comments generally supported the basis for and adoption of the on-site meteorological guidance document and MPRM in the Guideline. In addition, a variety of minor technical points were made about both. EPA has assessed these technical points individually and finds it unnecessary or inappropriate (as documented in the response to comments document) to act on most of them for this proposal. However, EPA agrees with comments suggesting a revised stability classification scheme. EPA developed a scheme and conducted a sensitivity analysis (Docket Item II-J-12). The scheme is included in an addendum (Docket Item II-J-14) to the guidance document, the Guideline and MPRM.

Conclusion: EPA proposes to reference the document "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" in section 9.3.3 as the primary source of supplementary guidance on the collection and use of on-site meteorological data. The hierarchy of stability classification schemes in that document will be changed to the preferred scheme that is based on solar radiation and temperature difference measurements, but the use of other

techniques prior to a year following promulgation will be exempt from this provision. As part of incorporation of the on-site guidance document, MPRM will be identified as the standard processor of on-site meteorological data input for regulatory model applications.

F. General Screening Techniques

The Guideline references Volume 10(R), EPA-450/4-77-001, as the basis of recommended screening techniques for stationary point sources. This document has been revised to incorporate additions to the technical approach and changes so that the techniques may easily be executed on a personal microcomputer. The revised document is "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources", EPA-450/4-88-010 (Docket Item II-I-20), including an addendum (Docket Item II-I-20a). The Guideline also references a visibility workbook, EPA-450/4-80-031. A revision of the document, "Workbook for Plume Visual Impact Screening and Analysis", EPA-450/4-88-015 (Docket Item II-I-13), has been prepared to reflect current technical information and experience. This revised document contains procedures and a visibility model that can be used for screening purposes to estimate visibility impairment from specific sources. Both of these revised documents were discussed at the fourth modeling conference.

Comments on the two sets of screening techniques were mixed, although EPA believes that these new personal computer based techniques are an improvement over the existing hand-calculation techniques. EPA has addressed a variety of criticisms and suggested changes in the response to comments document, where it is noted that many of these comments are either inappropriate or misinterpret the intent and basis of the guidance. Therefore, since there has been time for the public to gain additional experience with these techniques, their attributes will be more apparent and their basis relative to prior screening techniques better understood. These computerized techniques are not intended to be inherently different or more conservative, but are instead meant to better organize and ease the computational burden.

Conclusion: EPA proposes to identify "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources" with the SCREEN model as the recommended screening technique in section 4.2 of the Guideline. It also proposes to identify "Workbook for Plume Visual Impact Screening and Analysis" with the VISCREEN model as the recommended screening technique

for visibility assessments in section 7.2.4.

G. Method for Evaluating Models

The Guideline refers to "Interim Procedures for Evaluating Air Quality Models", EPA-450/4-84-023 as the basis for determining which of two or more models is most appropriate for a given application. However, EPA has recently refined these methods and advanced the statistical methodology for determining which model is better suited to a particular situation. With this newer methodology, it is feasible to combine results from different averaging periods and different data bases into a probabilistic framework. This methodology is described in an EPA report titled "Protocol for Determining the Best Performing Model" (Docket Item II-I-19) with an appendix that provides examples of a protocol comparing the performance of two rural air quality models. The method is now also documented in a user's guide (Docket Item II-I-33).

The public comments were cautious in their support of this improved methodology. Concerns primarily addressed flexibility of the techniques and limitations in experience with their use. Nevertheless, EPA believes that these techniques may be exercised with great flexibility: The example presented is not intended to be the only set of statistical comparisons. When used with this built-in flexibility, these techniques should enhance the ability to assess the relative merits of the available models for a given application.

Conclusion: EPA proposes to include the "Protocol for Determining the Best Performing Model" as an adjunct to the "Interim Procedures" when the use of an alternative model is being justified for a site specific application. This analysis procedure will be referenced in sections 3.2 and 10.1 of the Guideline.

H. Alternate Models in Appendix B

At the Fourth Conference on Air Quality Modeling, EPA identified four additional models that have unique applications for which there is currently no recommended model. Those models (and their applications) are: Shoreline Dispersion Model (SDM) (sea/lake breeze fumigation), WYNDvalley (valley stagnation), MESOPUFF-II (long-range transport), and PLUVUE-II (visibility). Actually no one long range transport model was specifically referenced, but from the limited statistical data available MESOPUFF-II appears to be the most accurate of the models identified in EPA's performance evaluation. MESOPUFF-II is also the

model for which EPA prepared an example protocol.

The public comments on these four models were mixed, but no fatal flaws were identified. However, there was general comment directed toward these models with which EPA basically agrees: that is, the performance evaluation of these models may be of limited utility due to sparse data bases. As a result, information on the performance of these models is either inadequate to justify recommending generic use or the evaluation has identified limitations which need to be further investigated before a recommendation may be issued. Information on the user's guides, codes and accuracy of these models beyond that information already in the Guideline follows:

SDM

User's Guide to SDM—A Shoreline Dispersion Model, EPA-450/4-88-017 (Docket Item II-I-15).

Analysis and Evaluation of Statistical Coastal Fumigation Models, EPA-450/4-87-002 (Docket Item II-I-14).

WYNDvalley

A User's Guide to WYNDvalley 3.11 (Docket Item II-I-16a-c).

MESOPUFF II

Evaluation of Short-Term, Long Range Transport Models, Volumes 1 and 2, EPA-450/4-86-016a and 016b (Docket Item II-I-9a and 9b).

Review of Short-Term Long Range Transport Models (Docket Item II-I-10).

A Modeling Protocol for Applying MESOPUFF-II to Long Range Transport Problems (Docket II-I-11).

Also see the Guideline.

PLUVUE II

See the Guideline.

Even with the limitations identified above and in the public comments, EPA finds that these models fill a unique void in available modeling applications and that they may be at least as accurate, under appropriate conditions, as other available techniques.

Conclusion: EPA is proposing to add SDM and WYNDvalley to appendix B of the Guideline. In addition, these models along with MESOPUFF-II and PLUVUE-II will be identified as models available for unique applications on a case-by-case basis in the following respective sections of the Guideline, sections 8.2.9, 8.2.10, 7.2.6, and 7.2.4.

I. Supplementary Changes

Besides the addition of new models, EPA is also proposing revisions to make

the Guideline consistent with regulatory programs that have been formalized or changed since the last major Guideline revision in 1986 (51 FR 32176).

In addition to minor wording changes, the following procedural changes/additions to the Guideline are worthy of note:

1. A recommendation for consultation with the Regional Office on complex issues concerning VOC/NO_x point source remodeling (section 6.2.1);
2. Clarification of modeling requirements applicable to prevention of significant deterioration for NO₂ (section 6.2.3);
3. Changing references to particulate matter, i.e., PM-10 replacing TSP (sections 7.2.2 and 11.2.3);
4. Clarification on the use of emissions data for NAAQS analyses associated with prevention of significant deterioration (PSD) compliance demonstrations (Table 9-2), in particular, estimating emissions in a manner which more closely reflects the allowable rather than the actual emissions for background sources³;
5. Deletion of the ERTAQ and MPSDM models from Appendix B at the request of the model developer since these models will no longer be supported and they have not been widely used;
6. Updates to the Offshore and Coastal Dispersion (OCD) model to reflect recent improvements prepared by the Minerals Management Service which has funded development of this model (appendix A);
7. Updates to the Urban Airshed Model and to EKMA (OZIP) to include the latest chemical mechanism (CB-4) and to reflect improved and updated guidance (section 6.2.1 and appendix A).

The CB-4 mechanism is being substituted because it is a clearly superior technique. It has been the subject of scientific and evaluation studies (Docket Item II-1-27) and the scientific community has generally found this chemical mechanism to be technically sound and to accurately represent detailed smog chamber findings (Docket Item II-1-26). Also, results from a study of St. Louis, where comparison between estimates and observations for CB-4 vs. CB-2 is possible, indicate more accurate ozone estimates and less underprediction with CB-4 (Docket Item II-1-34).

EPA has also reviewed the definition of model calibration in section 8.2.11 of

³ This clarification does not apply when calculating increment consumption under the PSD program, since the regulations applicable to that analysis require, as appropriate, actual (vs. allowable) emissions. See 40 CFR 52.21(b)(13)(ii); 45 FR 52717-52719, August 7, 1990.

the Guideline to determine if unacceptable practices are clearly and precisely identified and prohibited. This was done in response to a report by the General Accounting Office that addressed, in part, the consistent use of air quality models in regulatory decisions (Docket Item II-F-1). Upon review, EPA has found the Guideline to be clear and appropriately definitive; it states in part that "model calibration is unacceptable". Past experience has indicated that this guidance is unambiguous; further detail applied to prohibiting calibration of these complex mathematical tools could confuse and create the appearance of "loopholes". No further action on calibration or changes to section 8.2.11 are here proposed.

This Notice also proposes to amend 40 CFR part 51 to give regulatory status to long-standing EPA policy regarding the use of air quality models for purposes of control strategy development, AQMA analyses, classification of regions for episode plans, and new source review, thereby clarifying and codifying that the Guideline is applicable for those purposes. In addition to explicit reference to regulatory modeling in section 166 (as well as § 52.21), the introduction to the Guideline makes clear that its "air quality modeling techniques" * * * should be applied to State Implementation Plan (SIP) revisions for existing sources and to new source reviews * * *. Therefore, because use of air quality models is required in §§ 51.46 (Projection of Air Quality Concentrations) for projections associated with AQMA analyses, 51.112 (Demonstration of Adequacy) for SIP revisions, 51.117 (Additional Provisions for Lead) for analysis of lead concentrations, 51.150 (Prevention of Air Pollution Emergency Episodes) for classification of regions for episode planning, and 51.160 (Review of New Sources and Modifications) for new source review, this amendment to 40 CFR part 51 will serve to close a gap not addressed in previous rulemakings. Note that with respect to the proposed revision of 40 CFR 51.160, it is intended that the Guideline apply to the entire subpart, including but not limited to new and modified source review under §§ 51.165 (a) and (b) and 51.166(l).

J. Public Comments on Other Topics

At the Fourth Conference on Air Quality Modeling, EPA solicited comments on (1) the technical validity of a screening technique for point sources of ozone precursors and (2) the usefulness of regional scale models to regulatory programs. Public comments on the screening technique found them

inappropriate, too conservative, and requiring further research and testing. Based on these comments, EPA does not intend to propose these screening techniques for inclusion in the Guideline at this time.

With regard to regional scale models, commenters supported the need for and use of these models. However, it was felt that they are too computationally complex and costly in terms of computer and human resources to include in the Guideline at this time. EPA agrees that further testing and experience with these models is needed for regulatory application, and no recommendations on their use are being made at this time.

In addition, a variety of public comments were provided on subjects for which EPA did not seek input; most prominent were the variable emissions for SO₂ and the Industrial Source Complex (ISC) model. Commenters urged use of the expected exceedances method for estimating SO₂ concentrations and an expanded use of the multi-point rollback method (46 FR 58101, November 30, 1981). However, EPA does not intend to modify general provisions of the Guideline to include these methods. With the current deterministic form of the SO₂ NAAQS, the expected exceedances method would provide no assurance that the NAAQS would be attained and maintained. Also, EPA does not generally endorse multi-point rollback and has limited its use to a few cases for a single source type. Also, comments on ISC identified operating problems and concerns about limitations of the model. EPA has corrected the problems and is actively working to keep the model current. There is an ancillary ongoing program to upgrade the model to make it easier to use and maintain.

Other comments considered: (1) Issues which have been addressed elsewhere in EPA policy memoranda outside the scope of the Guideline; (2) issues that were previously resolved in prior Guideline revisions subjected to public comment; (3) narrow technical issues which are premature to address; and (4) issues upon which EPA has already acted, e.g., implementation of an electronic bulletin board. For obvious reasons, EPA plans no further action on these matters, as discussed in the response to comments document.

E.O. 12291

Under Executive Order 12291, EPA must decide whether a rule is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. The Administrator finds this proposed rule not major because it will not have an

annual effect on the economy of \$100 million or more; it will not result in a major increase in costs or prices; and there will be no significant adverse effects on competition, employment, investment, productivity, innovation or on the ability of U.S.-based enterprises to compete with foreign-based enterprises in domestic or export markets. This regulation will result in no significant environmental or energy impacts. Thus, no Regulatory Impact Analysis was conducted.

Regulatory Flexibility Act

Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that the attached proposed rule will not have a significant impact on a substantial number of small entities. This rule merely updates existing technical requirements for air quality modeling analyses required by other Clean Air Act programs (e.g., prevention of significant deterioration, new source review, SIP revisions) and imposes no new regulatory burdens.

Economic Impact Assessment

The requirement for performing an economic impact assessment in section 317 of the Act, 42 U.S.C. 7617, does not apply to this proposed action since the revisions included do not constitute a substantial change in the regulatory burden imposed by the regulation.

Paperwork Reduction Act

This proposed rule does not contain any information collection requirements subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980, U.S.C. 3501 *et seq.* EPA has submitted this regulation to the OMB for review under Executive Order 12291 and their written comments on the revisions and any EPA responses have been placed in the docket for this proceeding.

List of Subjects

40 CFR Part 51

Administrative practice and procedure, Air pollution control, Carbon monoxide, Hydrocarbons, Intergovernmental relations, Lead, Nitrogen dioxide, Ozone, Particulate matter, Reporting and recordkeeping requirements, Sulfur oxides.

40 CFR Part 52

Air pollution control, Lead, Nitrogen dioxide, Ozone, Sulfur oxides.

Authority: This Notice of Proposed Rulemaking is issued under the authority granted by sections 110(a)(2), 165(e), 172 (a) & (b), 173, 301(a)(1) and 320 of the 1977 Clean Air Act Amendments, 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) & (b), 7503, 7601(a)(1) and

7620, respectively (see Footnote 2 under "SUPPLEMENTARY INFORMATION").

Dated: February 5, 1991.

William K. Reilly,
Administrator.

It is proposed to amend part 51, chapter I, title 40 of the Code of Federal Regulations as follows:

PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

1. The authority citation for part 51 is revised to read as follows:

Authority: 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) and (b), 7503, 7601(a)(1) and 7620.

2. Section 51.46 is amended by revising paragraph (b) and removing paragraph (c) to read as follows:

§ 51.46 AQMA analysis: Projection of air quality concentrations.

* * * * *

Such concentrations shall be projected using techniques consistent with the requirements in § 51.112(a).

§ 51.63 [Amended]

3. In § 51.63, paragraph (a) is amended by removing "51.46,".

4. In § 51.112, paragraph (a) is amended by removing the second sentence and adding paragraphs (a)(1) and (a)(2) to read as follows:

§ 51.112 Demonstration of adequacy.

(a) * * *

(1) The adequacy of a control strategy shall be demonstrated by means of applicable air quality models, data bases, and other requirements specified in the "Guideline on Air Quality Models (Revised)" (1986), supplement A (1987) and supplement B (1990), which are incorporated by reference. The Guideline and its Supplements (EPA Publication No. 450/2-78-027R) are for sale from the U.S. Department of Commerce, National Technical Information Service, 5825 Port Royal Road, Springfield, VA 22161. They are also available for inspection at the Office of the Federal Register, room 8301, 1100 L Street NW., Washington, DC. These materials are incorporated as they exist on the date of approval and a notice of any change will be published in the *Federal Register*.

(2) Where an air quality model specified in the "Guideline on Air Quality Models (Revised)" (1986), supplement A (1987) and supplement B (1990) is inappropriate, the model may be modified or another model substituted. Such a modification or substitution of a model may be made on a case-by-case basis or, where

appropriate, on a generic basis for a specific state program. Written approval of the Administrator must be obtained for any modification or substitution. In addition, use of a modified or substituted model must be subject to notice and opportunity for public comment under procedures and set forth in § 51.102.

§ 51.117 [Amended]

5. In § 51.117, paragraph (c)(1) is amended by adding the phrase ", consistent with requirements contained in § 51.112(a)" immediately after "* * * if desired". Paragraph (c)(2) is amended by adding the phrase ", consistent with requirements contained in § 51.112(a)" immediately after "* * * for demonstration of attainment". Paragraph (c)(3) is amended by adding the phrase ", consistent with requirements contained in § 51.112(a)" immediately after "* * * for the demonstration of attainment".

§ 51.150 [Amended]

6. In § 51.150, paragraph (e) is amended by adding the phrase ", consistent with the requirements contained in § 51.112(a)" immediately after "* * * of this section" in the first sentence, and by removing the second sentence.

7. In § 51.160, is amended by adding paragraphs (f)(1) and (f)(2) to read as follows:

§ 51.160 Legally enforceable procedures.

* * * * *

(f) * * *

(1) All applications of air quality modeling involved in this subpart shall be based on the applicable models, data bases, and other requirements specified in the "Guideline on Air Quality Models (Revised)" (1986), supplement A (1987) and supplement B (1990), which are incorporated by reference. The Guideline and its Supplements (EPA Publication No. 450/2-78-027R) are for sale from the U.S. Department of Commerce, National Technical Information Service, 5825 Port Royal Road, Springfield, VA, 22161. They are also available for inspection at the Office of the *Federal Register*, room 8301, 1100 L Street, NW., Washington, DC. These materials are incorporated as they exist on the date of approval and a notice of any change will be published in the *Federal Register*.

(2) Where an air quality model specified in the "Guideline on Air Quality Models (Revised)" (1986),

supplement A (1987) and supplement B (1990) is inappropriate, the model may be modified or another model substituted. Such a modification or substitution of a model may be made on a case-by-case basis or, where appropriate, on a generic basis for a specific state program. Written approval of the Administrator must be obtained for any modification or substitution. In addition, use of a modified or substituted model must be subject to notice and opportunity for public comment under procedures set forth in § 51.102.

§ 51.166 [Amended]

8. In § 51.166, paragraph (l)(1) and (l)(2) are amended by removing "and supplement A (1987)" and by adding ", supplement A (1987) and supplement B (1990)".

It is proposed to amend part 52, chapter I of title 40 of the Code of Federal Regulations as follows:

PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS

1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401-7642.

§ 52.21 [Amended]

2. In § 52.21, paragraph (l)(1) and (l)(2) are amended by removing "and supplement A (1987)" and by adding ", supplement A (1987) and supplement B (1990)".

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