Ray Wenker
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cc: ACB 1/27/92

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

26 DEC 1991

MEMORANDUM

SUBJECT: Information Copy of El Paso-Juarez PM-10 Modeling Scoping Study

FROM: William G. Laxton, Director
Technical Support Division (MD-14)

for John Calcagni, Director
Air Quality Management Division (MD-15)

TO: A. Stanley Meiburg, Director
Air, Pesticides & Toxics Division, Region VI (6T)

This is in response to your memorandum of November 27, 1991. The Model Clearinghouse has completed its review of the subject PM-10 Modeling Scoping Study and has the following comments.

We agree with the contractor's (Systems Applications International, SAI) recommendations on selection of models for use in PM-10 SIP development in this airshed. The rationale provided supports the selection of the Urban Airshed Model (UAM) for episode modeling, the Diagnostic Windfield Model (DWM) for preparing windfield data for use in UAM, and the Chemical Mass Balance (CMB) model for receptor modeling.

The report is generally well written and professional. However, the success of the SAI proposal is dependent on a number of assumptions/conclusions not all of which can be evaluated from the information available at this time. For example, one of the critical references, which is cited several times in the SAI report, is a personal communication (Enfield and Church, 1991); alternative references to written documentation should be provided for these citations. An assessment of the need for "hot spot" modeling should be included, especially since hot spot modeling is not possible with UAM. A better description of the intended receptor model/dispersion model reconciliation process, based on EPA guidance, is needed and should be included in the modeling protocol. Finally, a performance evaluation of the reconciled dispersion model using an independent data set is appropriate and should also be included in the modeling protocol. More detailed comments on these and other issues are being sent directly to Jim Yarbrough.

If you have questions or need additional information, please contact Desmond Bailey at FTS 629-5248 or me.

Attachments

cc: G. Blais
T. Coulter
D. Wilson
J. Yarbrough

Model Clearinghouse Comments on
Modeling Program for PM-10 State Implementation Plan Development
for the El Paso/Ciudad Juarez Airshed

Issue Conclusion or Assumption	Comment
Secondary particulate formation is not significant and, thus, PM-10 fractions of sulfate and nitrate can be attributed to their sources by a linear rollback calculation based on SO_2 and NO_x emissions. (pp. 6, 33)	The conclusion is based, in part, on analysis of denuder samples from one site for the December 1990 episode. Other than the lack of other supporting material there is no reason to doubt the validity of the conclusion.
Vehicular, biomass combustion, unpaved roads and smelters are the primary emission sources contributing to the PM-10 problem (Einfield and Church, 1991). (p. 10)	This citation refers to a personal communication which should be documented.
High PM-10 episodes in wintertime bias annual average PM-10 concentrations. Thus, control strategies to attain the short-term NAAQS will also ensure attainment of the annual standard. (pp. 10, 33)	If this is not the case then alternative strategies will be needed to assess attainment of the annual standard. UAM is not suited for long-term (annual average) analyses.
Source apportionment based on analysis of short-term samples will be representative of the higher PM-10 concentration events that influence the annual average. (p. 33)	As stated (p.33), if CMB results do not confirm this assumption, then it may be necessary to employ a long-term dispersion model ... The resources required ... however, would be considerable.

ATTACHMENT

UAM will be modified to accept more than one aerosol species and thus allow determination of source contributions without multiple simulations. (pp. 19, 33)	This should not be a problem.
Point, area and mobile source emission inventories, particularly for Juarez, will be developed and will be of a quality demanded by highly detailed, gridded dispersion models. (pp. 36-37)	This is probably the most uncertain element in the proposal. Detailed procedures should be prepared to ensure an accurate and complete inventory. This is especially critical, given the problems encountered in the past (i.e., by Alliance Technologies).
Maximum advantage can be taken of the ongoing UAM applications to the El Paso ozone problem. (pp. 32, 34)	Early on coordination with the UAM ozone application will be necessary to ensure maximum use of information and intermediate products (e.g., grids) for both applications.
The ongoing assessments of meteorological data quality will show that data are sufficient and acceptable for use in episode and long-term modeling, as necessary. (pp. 30, 38)	Quality meteorological data is critical. As stated (p. 38), if data quality is poor ... then another intensive field study may be necessary.
DWM performance for the El Paso region will be improved through full use or better selection of input parameters (Douglas, 1991). (p. 37)	Experience gained from the ozone application should be useful in this task.

Receptor Modeling/Sampling Issues

1. Source profile data acquisition

On p. 23, last paragraph, it is stated that "each source class is tested to determine a representative chemical species profile ..." On p. 36, 3rd paragraph, it states that "it is recommended that region-specific source profiles be developed for El Paso ..." On p. 37, 1st paragraph, it is stated that "EPA and SEDUE are considering joint stack testing of major sources in the airshed to supply additional CMB ... information." However, on p. 24, 2nd paragraph, there is the implication that existing source profile libraries will be used in CMB analysis. The importance of site specific source fingerprints cannot be overemphasized. Library profiles, available through EPA's Speciation Data System (SPECIATE) or otherwise, are usually dated, non-site specific, and may be of poor or questionable quality. To the extent possible, all significant sources or PM-10, especially fugitive and area sources, should be carefully speciated in order for CMB to apportion properly. The intention to do this should be detailed in Task 8 (p. 43).

2. Ambient sampling

On the top of p. 33, reference is made to "both the fine and coarse PM_{10} fractions." The cutpoints for these fractions, however, is not specified in the report. Presumably, the cutpoints will be at 2.5 and 10μm. Extreme care should be taken to assure that accurate and consistent flow rates are maintained in the dichotomous samplers to attain the desired cutpoint. This dichotomous sampling should be useful in assessing the importance of dry deposition in the El Paso airshed; particles in the 2.5 - 10μm range settle 20-40 times as fast as those in the 0 - 2.5μm range.

On p. 34, 1st full paragraph, it is suggested to modify UAM to output 12-hour averages. Obviously, this would only be appropriate if ambient samples are 12-hour. In most SLAMS/NAMS systems, PM-10 is sampled for 24-hour periods. This apparent discrepancy should be clarified.

If secondary particle formation **is** considered to be important, great care must be taken in sampling; 80% of NO_3^{-1} is typically volatilized in conventional sampling processes.

3. Dispersion model/receptor model reconciliation

As discussed on p. 35, reconciliation should be part of the overall performance evaluation process. Indeed, this is stipulated in

EPA's PM-10 SIP Development Guideline (June 1987; EPA-450/2-86-001). A reconciliation protocol should be established and detailed as a task following #9: CMB Application (p. 43). Guidance for such a reconciliation effort may be found in EPA's Protocol for Reconciling Differences among Receptor and Dispersion Models (March 1987; EPA-450/4-87-008).

4. Quality control/quality assurance

To add emphasis to the discussion on p. 39-40, great care should be taken to assure consistent quality control in the sampling and analyses performed for CMB calculations. In particular, the same analytical methods used for assaying elements in the ambient samples should be used for those in the source profiles.

5. Miscellaneous

On p. 36, 4th paragraph, it is unclear how CMB is to be used to "demonstrate attainment of the ... standard." Such application connotes a predictive capability of the model. CMB is not a predictive model in the sense of dispersion models; it is classically used to attribute emissions to particular sources (or source categories)[1] and as such is useful for refining the emission inventory used in a dispersion modeling analysis.

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[1]Actually, it is stated on p. 23 that "... receptor models infer the contributions of sources ..."

FY-92 MODEL CLEARINGHOUSE MEMORANDA

Date	Region	Subject
10/16/91	IV	Dade County, Florida, Stack Height Increase
11/7/91	VI	Phelps Dodge--Hidalgo Modeling Protocol
11/15/91	VIII	ASARCO E. Helena Lead State Implementation Plan (SIP)
12/04/91	I	Proposal to Use a Non-Guideline Model to Satisfy Intermediate Terrain Policy in New Source Permitting (Pine State Power; Jay, Maine)
12/18/91	VI	Information Copy of El Paso-Juarez PM-10 Modeling