UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: 16 NOV 1987

SUBJECT: Meteorological Preprocessor Program

Michael Koerber

FROM: Michael Koerber
Regional Meteorologist

TO: Joseph Tikvart, Chief
Source Receptor Analysis Branch

The purpose of this memo is to provide for your information a meteorological preprocessor program developed by the Indiana Department of Environmental Management for on-site meteorological data. Although I believe that the Atmospheric Sciences Research Laboratory has been working on such a preprocessor program (i.e., MPDA-1), we cannot wait until this program is available. The State of Indiana is under a time constraint to develop and submit revised sulfur dioxide emission limitations for 15 counties. The modeling being performed by the State to develop emission limits uses on-site meteorological data for many of these counties, per the recommendation of Region V. The State created a meteorological preprocessor program to organize the available data into the necessary model-ready format. Region V is accepting the use of this preprocessor for current modeling analyses in the State.

Attachment #1 is a copy of a recent request from the State of Indiana for guidance on preprocessing on-site meteorological data. The attachment includes the computer code for their program. Additional information concerning the program is contained in Attachment #2. In developing this program, consistency with the "Guideline on Air Quality Models (Revised)", July 1986, the CRSTER meteorological preprocessor, and USEPA's "On-Site Meteorological Program Guidance for Regulatory Modeling Applications", June 1987, was attempted.

In my review of the Indiana program, several general questions concerning the preprocessing of on-site data have arisen that I would appreciate your comments to:

1. For calculating the mixing height, where should the surface temperature value be obtained? (The derived mixing heights used as input to Indiana's program were based on the temperature values from the nearest National Weather Service station. In addition to this approach, two other approaches have used in Region V (i.e., use of surface temperature from the upper air station, and use of surface temperature from the surface (primary) station). I believe that a consistent national approach is necessary.)

2. If the primary site measures a valid calm hour, then should the hour be discarded via the calms treatment in CALMPRO or should the wind direction and wind speed from another site be substituted? (The Indiana program uses the substitution approach.)

3. Can surface roughness be varied on a directional basis? (Note, if 30^{o} wind direction sectors are assumed, then 12 surface roughness values must be input. As currently written, Indiana's program would use the wind direction from the primary site (typically, 60m level) to select the appropriate roughness value for a given hour. Stability classifications, however, should be based on 10m wind data. Because the wind direction at 60m may fall within a different 30^{o} sector than the wind direction at 10m, it would appear to be necessary to modify the program to save and apply the 10m wind direction for that hour. Your comments on this program change would be appreciated.)

Please call me if you wish to discuss this memo further.

Attachments

cc: Barry Smith
Indiana Department of Environmental Management