Copy to Brenda Johnson

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

Received 1/13/91

December 31, 1991

Mr. Douglas Neeley, Chief
Air Programs Branch
Air, Pesticides and Toxics
Management Division
U.S. Environmental Protection
Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Neeley:

Enclosed you will find a copy of Florida's proposed Empirical Kinetic Modeling Approach (EKMA) protocol. The modeling protocol follows the suggested approach described in "Procedures for Applying City-Specific EKMA" (EPA-450/4-89-012). If you have any questions regarding the protocol please contact Tom Rogers at 904/488-1344.

For your information, in our comments on the Title I General Preamble we have suggested that an alternative method be allowed for making an attainment demonstration. This method would not require the use of the EKMA model but would be based on the actual monitored ozone concentrations. It should be noted that if Florida were to use the EKMA model in accordance with the procedures guideline noted above, the most recent three years of data would show a design value less than the ambient standard. Therefore, no further emissions reductions would be required.

Sincerely,

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources Management

SS:jr
enclosure

cc: Isidore Goldman, S.E. District
Patrick Wong, Dade County
Al Linero, Broward County
Jim Stormer, Palm Beach County

State of Florida EKMA Modeling Protocol - 12/31/91

1. Region to be modeled:

Southeast Florida (Dade, Broward, and Palm Beach Counties).

2. Selection of Modeling Cases:

The five highest daily, maximum ozone concentrations at each site will be selected for modeling. The five highest values will be chosen from the most recent three years during which measurements were made at the sites (1989-1991).

3. Model Inputs:

a. Sunlight Intensity:
 1. Latitude of City (26 deg N)
 2. Longitude of City (80.5 deg W)
 3. Time Zone = 4.0 (Eastern Daylight Time)
 4. Days of the Year - To be selected based on highest ozone days.

b. Dilution:
 1. City-Specific Estimate of 0800 LCT Mixing Height. Appendix B of procedures document will be followed (Minimum of 250m).
 2. City-Specific Maximum Afternoon Mixing Height. Appendix B of procedures document will be followed.
 3. Time that the Mixing Height Rise Begins.
 4. Time that the Maximum Mixing Height is Attained.

c. Post-0800 Emissions:
 1. Emissions will be entered as emission densities (kg/km2).
 2. Large NOx sources may require a review of effective stack height to determine if the NOx emissions are within the mixed surface layer.
 3. Emission densities will be calculated for
  a. NMOC
  b. NOx
  c. CO
 4. Initial NO2/NOx ratio will be the default value Of 0.25.

d. Ozone Transport:
 1. Present ozone transport at the surface will be set to zero for each day modeled.
 2. Present transport of ozone aloft will be estimated by the 1000-1200 LCT average ozone concentration recorded at an upwind monitor.

3. Future transport of ozone will be calculated from the following formulas:
   a. For areas with large nonattainment area upwind:
      O3(future) = 0.7 * (O3(present) - 0.04) + 0.04
   b. For isolated areas:
      O3(future) = 0.9 * (O3(present) - 0.04) + 0.04

e. Precursor Transport:
   1. Surface Layer Transport Concentrations
      a. NOx = 0
      b. NMOC = 0
   2. Aloft Transport Concentrations
      a. NOx = 20ppb
      b. NMOC = 30ppbC
      c. CO = 0.5 ppm

f. Reactivity:
   1. Surface NMOC
      Carbon-fractions will be derived from analyses of ambient air samples by gas chromatography. The data for these analyses were obtained from West Palm Beach and Ft. Lauderdale, Florida during the summer of 1991.
   2. NMOC Aloft (Recommended Default Values)
      a. PAR = .498
      b. ETH = .034
      c. OLE = .020
      d. ALD2 = .037
      e. FORM = .070
      f. TOL = .042
      g. XYL = .026
      h. ISOP = 0
      i. NR = .273

g. Temperature:
   Hourly meteorological observations will be used.

h. Water Vapor:
   Hourly meteorological observations will be used.

i. Biogenic Emissions:
   PC-BEIS will be used for each day that is modeled.

j. Special Meteorological Considerations
   Based on previous data, it is apparent that the meteorological conditions that result in

elevated levels of ozone also result in light large scale winds. This lack of a large scale circulation allows for the development of the land/sea breeze circulation pattern over the coastal areas of Southeastern Florida. During the early morning hours the general flow is offshore, with an onshore breeze developing in the late morning or early afternoon. This circulation pattern does not follow the straight line flow pattern that is assumed in the model. Consequently, modifications to some input parameters will have to be made to adequately represent this flow pattern. For example, surface emissions of VOC and NOx will be set to zero (or near zero) during transport over the Atlantic ocean so that the recirculatiing pattern will be reflected in the emissions to the column.

4. Predicting Peak Ozone:

   The method described in "Procedures for Applying: City-Specific EKMA" (EPA-450/4-89-012) will be followed.

5. Computing VOC Emission Reductions:

   The method described in "Procedures for Applying City-Specific EKMA" (EPA-450/4-89-012) will be followed

6. Selection of the VOC Emission Reduction Target:

   The method described in "Procedures for Applying City-Specific EKMA" (EPA-450/4-89-012) will be followed.