NaviKnow

Dispersion Modeling Training Series

3 Ways to Increase Productivity in Dispersion Modeling

Procedure for Generic Modeling Screening Mode

I. **Model Input File Settings**
   a. Unit emission rate (1 lb/hr or 1 g/sec) for each source
   b. Source group for each source with only the one source
   c. Use any averaging time, but 1-HOUR is recommended
   d. Select the PLOTFILE output option
   e. Write all of the results to one PLOTFILE
   f. Use the NOHEADER option (recommended)

II. **Creating Data Table With Emission Rates**
   a. Create a data table with fields for the Source ID (source group), contaminant name, scenario name (optional), and the emission rate. Keeping with best practices, have all fields as text. Be sure to document the units of the emission rates.
   b. Enter each Source ID and the associated emission rate

III. **Importing PLOTFILE Results**
   a. Import PLOTFILE results into database table. If you did not use the NOHEADER option, you may run into problems during the import. If no problems arise, you will need to delete the records that contain the header entries.
   b. Since the PLOTFILE is a fixed length record, you will need to specify each position of the data fields. For the PLOTFILE reporting only concentration, the field positions are listed below:
      - X 1-14
      - Y 15-28
      - CONC 29-42
      - Z 43-51
      - Zhill 52-60
      - Zflag 61-69
      - AVG_TIME 70-78
      - GRP_NAME 79-87
      - RANK 88-97
      - YR 110-111
      - MO 112-113
      - DY 114-115
      - HR 116-117

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IV. Calculating Contaminant Specific Results

a. Create query using emission rate data table and PLOTFILE results data table.
b. First, create a subquery from the PLOTFILE results data table returning the following fields:
    i. Source group
    ii. The Maximum concentration value (CONC)
    iii. Averaging time
    iv. Rank
c. The maximum concentration value is based on the following field grouping:
    i. Source group
    ii. Averaging time
    iii. Rank
d. Join (Inner Join) the subquery result with emission rate data table on source group name
e. The query should return the following fields:
    i. Air contaminant name
    ii. Scenario name
    iii. The sum of the product of the emission rate and unitized concentration of each source group
f. The sum of the products is based on the following field grouping:
    i. Air contaminant
    ii. Scenario name
    iii. Averaging time
    iv. Rank
g. The final result is the maximum ground-level concentration (GLCmax) for each air contaminant independent of location or time.

NB. The results showing the maximum concentration at each receptor independent of time, involves a subquery nested within a subquery.

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Procedure for Generic Modeling Refined Mode

I. Model Input File Settings

a. Unit emission rate (1 lb/hr or 1 g/sec) for each source
b. Source group for each source with only the one source
c. Use any averaging time, but 1-HOUR is recommended
d. Select the MAXIFILE output option
e. Set the threshold value to 0.0001
f. Write all of the results to one MAXIFILE
g. Use the NOHEADER option (recommended)
h. The file size will be big

II. Creating Data Table With Emission Rates

a. Create a data table with fields for the Source ID (source group), contaminant name, scenario name (optional), and the emission rate. Keeping with best practices, have all fields as text. Be sure to document the units of the emission rates.
b. Enter each Source ID and the associated emission rate

III. Importing MAXIFILE Results

a. Import MAXIFILE results into database table. If you did not use the NOHEADER option, you may run into problems during the import. If no problems arise, you will need to delete the records that contain the header entries.
b. Since the MAXIFILE is a fixed length record, you will need to specify each position of the data fields. For the MAXIFILE reporting only concentration, the field positions are listed below:

- AVG_TIME 1-4
- GRP_NAME 6-13
- YR 15-16
- MO 17-18
- DY 19-20
- HR 21-22
- X 24-36
- Y 38-50
- Z 52-58
- Zhill 60-66
- Zflag 68-74
- CONC 76-89

NB. The results showing the maximum concentration at each receptor, involves multiple nested subqueries. Basically, the calculation of the sum of the products of the emission rates and unitized concentrations takes place at each receptor for each hour. You would then find the maximum concentration at each receptor, then the maximum concentration overall.

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