Cleco, Brame Energy Center
BRETON WILDERNESS AREA CALPOST 2001
VISIBILITY METHOD 8

---------- Run title (3 lines) ----------

CALPOST MODEL CONTROL FILE
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INPUT GROUP: 0 -- Input and Output File Names
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Input Files
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| File | Default File Name | |
|---|---|---|
| Conc/Dep Flux File | MODEL.DAT | ! MODDAT =PU_CLECO_01.FLX ! |
| Relative Humidity File | VISB.DAT | * VISDAT = * |
| Background Data File | BACK.DAT | * BACKDAT = * |
| Transmissometer or | VSRN.DAT | * VSRDAT = * |
| Nephelometer Data File or | | |
| DATSAV Weather Data File or | | |
| Prognostic Weather File | | |

Single-point Met File SURFACE.DAT * MET1DAT = *
(Used ONLY to identify CALM hours for plume model
output averaging when MCALMPRO option is used)

Output Files
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| File | Default File Name | |
|---|---|---|
| List File | CALPOST.LST | ! PSTLST =CT_CLECO_01_BRET.LST ! |

Pathname for Timeseries Files (blank) * TSPATH = *
(activate with exclamation points only if
providing NON-BLANK character string)

Pathname for Plot Files (blank) * PLPATH = *
(activate with exclamation points only if
providing NON-BLANK character string)

User Character String (U) to augment default filenames
(activate with exclamation points only if
providing NON-BLANK character string)

Timeseries TSERIES_ASPEC_ttHR_CONC_TSUNAM.DAT
Peak Value PEAKVAL_ASPEC_ttHR_CONC_TSUNAM.DAT

* TSUNAM = *

```
Top Nth Rank Plot   RANK(ALL)_ASPEC_ttHR_CONC_TUNAM.DAT
            or  RANK(ii)_ASPEC_ttHR_CONC_TUNAM.GRD

                                  * TUNAM =   *

Exceedance Plot      EXCEED_ASPEC_ttHR_CONC_XUNAM.DAT
            or  EXCEED_ASPEC_ttHR_CONC_XUNAM.GRD

                                  * XUNAM =   *

Echo Plot
(Specific Days)
        yyyy_Mmm_Ddd_hhmm(UTCszzzz)_L00_ASPEC_ttHR_CONC.DAT
    or    yyyy_Mmm_Ddd_hhmm(UTCszzzz)_L00_ASPEC_ttHR_CONC.GRD


Visibility Plot      DAILY_VISIB_VUNAM.DAT   ! VUNAM =VTEST   !
(Daily Peak Summary)


Auxiliary Output Files
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File                    Default File Name
----                   -----------------
Visibility Change        DELVIS.DAT        * DVISDAT =   *

-------------------------------------------------------------------------------
All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
       T = lower case              ! LCFILES = T !
       F = UPPER CASE
NOTE: (1) file/path names can be up to 132 characters in length
NOTE: (2) Filenames for ALL PLOT and TIMESERIES FILES are constructed
        using a template that includes a pathname, user-supplied
        character(s), and context-specific strings, where
          ASPEC = Species Name
           CONC = CONC Or WFLX Or DFLX Or TFLX
             tt = Averaging Period (e.g. 03)
             ii = Rank (e.g. 02)
             hh = Hour(ending) in LST
          szzzz = LST time zone shift (EST is -0500)
           yyyy = Year(LST)
             mm = Month(LST)
             dd = day of month (LST)
        are determined internally based on selections made below.
        If a path or user-supplied character(s) are supplied, each
        must contain at least 1 non-blank character.

!END!
-------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
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```

```
Option to run all periods found
in the met. file(s)  (METRUN)       Default: 0   ! METRUN =   1  !

   METRUN = 0 - Run period explicitly defined below
   METRUN = 1 - Run all periods in CALPUFF data file(s)

Starting date:   Year   (ISYR)  --   No default   ! ISYR  =  2001  !
                 Month  (ISMO)  --   No default   ! ISMO  =  1  !
                 Day    (ISDY)  --   No default   ! ISDY  =  1  !
Starting time:   Hour   (ISHR)  --   No default   ! ISHR  =  0  !
                 Minute (ISMIN) --   No default   ! ISMIN =  0  !
                 Second (ISSEC) --   No default   ! ISSEC =  0  !

Ending date:     Year   (IEYR)  --   No default   ! IEYR  =  2001  !
                 Month  (IEMO)  --   No default   ! IEMO  =  12  !
                 Day    (IEDY)  --   No default   ! IEDY  =  31  !
Ending time:     Hour   (IEHR)  --   No default   ! IEHR  =  0  !
                 Minute (IEMIN) --   No default   ! IEMIN =  0  !
                 Second (IESEC) --   No default   ! IESEC =  0  !

(These are only used if METRUN = 0)

All times are in the base time zone of the CALPUFF simulation.
CALPUFF Dataset Version 2.1 contains the zone, but earlier versions
do not, and the zone must be specified here.  The zone is the
number of hours that must be ADDED to the time to obtain UTC (or GMT).
Identify the Base Time Zone for the CALPUFF simulation
                    (BTZONE) -- No default   ! BTZONE = 0.0 !

Process every period of data?
                     (NREP) -- Default: 1   ! NREP  =  1  !
 (1 = every period processed,
  2 = every 2nd period processed,
  5 = every 5th period processed, etc.)

Species & Concentration/Deposition Information
----------------------------------------------

  Species to process (ASPEC)      -- No default   ! ASPEC = VISIB  !
  (ASPEC = VISIB for visibility processing)

  Layer/deposition code (ILAYER)   -- Default: 1   ! ILAYER =  1  !
   '1'  for CALPUFF concentrations,
   '-1' for dry deposition fluxes,
   '-2' for wet deposition fluxes,
   '-3' for wet+dry deposition fluxes.

  Scaling factors of the form:     -- Defaults:    ! A =  0.0    !
      X(new) = X(old) * A + B        A = 0.0    ! B =  0.0    !
   (NOT applied if A = B = 0.0)       B = 0.0

  Add Hourly Background Concentrations/Fluxes?
                    (LBACK)  -- Default: F   ! LBACK =  F !


  Source of NO2 when ASPEC=NO2 (above) or LVNO2=T (Group 2) may be
```

from CALPUFF NO2 concentrations OR from a fraction of CALPUFF NOx concentrations. Specify the fraction of NOx that is treated as NO2 either as a constant or as a table of fractions that depend on the magnitude of the NOx concentration:

(NO2CALC) -- Default: 1 ! NO2CALC = 1 !

0 = Use NO2 directly (NO2 must be in file)
1 = Specify a single NO2/NOx ratio (RNO2NOX)
2 = Specify a table NO2/NOx ratios (TNO2NOX)
(NOTE: Scaling Factors must NOT be used with NO2CALC=2)

Single NO2/NOx ratio (0.0 to 1.0) for treating some or all NOx as NO2, where [NO2] = [NOX] * RNO2NOX (used only if NO2CALC = 1)

(RNO2NOX) -- Default: 1.0 ! RNO2NOX = 1.0 !

Table of NO2/NOx ratios that vary with NOx concentration. Provide 14 NOx concentrations (ug/m**3) and the corresponding NO2/NOx ratio, with NOx increasing in magnitude. The ratio used for a particular NOx concentration is interpolated from the values provided in the table. The ratio for the smallest tabulated NOx concentration (the first) is used for all NOx concentrations less than the smallest tabulated value, and the ratio for the largest tabulated NOx concentration (the last) is used for all NOx concentrations greater than the largest tabulated value. (used only if NO2CALC = 2)

NOx concentration(ug / m3)

(CNOX) -- No default

! CNOX = 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0,
8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0 !

NO2/NOx ratio for each NOx concentration:

(TNO2NOX) -- No default

! TNO2NOX = 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0,
1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0 !

Source information
---

Option to process source contributions:

0 = Process only total reported contributions
1 = Sum all individual source contributions and process
2 = Run in TRACEBACK mode to identify source contributions at a SINGLE receptor

(MSOURCE) -- Default: 0 ! MSOURCE = 0 !

Plume Model Output Processing Options
---

Output from models other than CALPUFF and CALGRID can be written in the CONC.DAT format and processed by CALPOST. Plume models such as AERMOD typically do not treat CALM hours, and do not include such hours in multiple-hour averages, with specific rules about how many calm hours can be removed from an average. This treatment is known as CALM

```
  PROCESSING.  Calm periods are identified from wind speeds in the
  meteorological data file for the application, which must be identified
  in Input Group 0 as the single-point meteorological data file MET1DAT.
        0 =  Option is not used for CALPUFF/CALGRID output files
        1 =  Apply CALM processing procedures to multiple-hour averages
                    (MCALMPRO) -- Default: 0   ! MCALMPRO =  0  !

  Format of Single-point Met File
        1 =  AERMOD/AERMET SURFACE file
                    (MET1FMT) -- Default: 1   ! MET1FMT =  1  !


Receptor information
--------------------

  Gridded receptors processed?    (LG) -- Default: F   ! LG  = F  !
  Discrete receptors processed?   (LD) -- Default: F   ! LD  = T  !
  CTSG Complex terrain receptors processed?
                              (LCT) -- Default: F   ! LCT = F  !

--Report results by DISCRETE receptor RING?
  (only used when LD = T)     (LDRING) -- Default: F   ! LDRING = F  !

--Select range of DISCRETE receptors (only used when LD = T):

  Select ALL DISCRETE receptors by setting NDRECP flag to -1;
                            OR
  Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each
    0 = discrete receptor not processed
    1 = discrete receptor processed
  using repeated value notation to select blocks of receptors:
    23*1, 15*0, 12*1
  Flag for all receptors after the last one assigned is set to 0
  (NDRECP) -- Default: -1
                                   ! NDRECP = 80*0, 40*1!


--Select range of GRIDDED receptors (only used when LG = T):

      X index of LL corner (IBGRID) -- Default: -1     ! IBGRID = -1  !
         (-1 OR 1 <= IBGRID <= NX)

      Y index of LL corner (JBGRID) -- Default: -1     ! JBGRID = -1  !
         (-1 OR 1 <= JBGRID <= NY)

      X index of UR corner (IEGRID) -- Default: -1     ! IEGRID = -1  !
         (-1 OR 1 <= IEGRID <= NX)

      Y index of UR corner (JEGRID) -- Default: -1     ! JEGRID = -1  !
         (-1 OR 1 <= JEGRID <= NY)

  Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1


--Specific gridded receptors can also be excluded from CALPOST
  processing by filling a processing grid array with 0s and 1s.  If the
```

processing flag for receptor index (i,j) is 1 (ON), that receptor will be processed if it lies within the range delineated by IBGRID, JBGRID,IEGRID,JEGRID and if LG=T. If it is 0 (OFF), it will not be processed in the run. By default, all array values are set to 1 (ON).

Number of gridded receptor rows provided in Subgroup (1a) to identify specific gridded receptors to process
(NGONOFF) -- Default: 0 ! NGONOFF = 0 !

!END!

---
Subgroup (1a) -- Specific gridded receptors included/excluded
---

Specific gridded receptors are excluded from CALPOST processing by filling a processing grid array with 0s and 1s. A total of NGONOFF lines are read here. Each line corresponds to one 'row' in the sampling grid, starting with the NORTHERNMOST row that contains receptors that you wish to exclude, and finishing with row 1 to the SOUTH (no intervening rows may be skipped). Within a row, each receptor position is assigned either a 0 or 1, starting with the westernmost receptor.
0 = gridded receptor not processed
1 = gridded receptor processed

Repeated value notation may be used to select blocks of receptors:
23*1, 15*0, 12*1

Because all values are initially set to 1, any receptors north of the first row entered, or east of the last value provided in a row, remain ON.

(NGXRECP) -- Default: 1

---

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)
---

Test visibility options specified to see if they conform to FLAG 2008 configuration?
(MVISCHECK) -- Default: 1 ! MVISCHECK = 1 !
0 = NO checks are made
1 = Technical options must conform to FLAG 2008 visibility guidance
ASPEC = VISIB
LVNO2 = T
NO2CALC = 1
RNO2NOX = 1.0
MVISBK = 8
M8_MODE = 5

Some of the data entered for use with the FLAG 2008 configuration are specific to the Class I area being evaluated. These values can

be checked within the CALPOST user interface when the name of the
Class I area is provided.

Name of Class I Area (used for QA purposes only)
(AREANAME) -- Default: User ! AREANAME = BRET !

Particle growth curve f(RH) for hygroscopic species
(MFRH) -- Default: 4 ! MFRH = 4 !

1 = IWAQM (1998) f(RH) curve (originally used with MVISBK=1)
2 = FLAG (2000) f(RH) tabulation
3 = EPA (2003) f(RH) tabulation
4 = IMPROVE (2006) f(RH) tabulations for sea salt, and for small and large SULFATE and NITRATE particles;
Used in Visibility Method 8 (MVISBK = 8 with M8_MODE = 1, 2, or 3)

Maximum relative humidity (%) used in particle growth curve
(RHMAX) -- Default: 98 ! RHMAX = 95 !

Modeled species to be included in computing the light extinction
Include SULFATE? (LVSO4) -- Default: T ! LVSO4 = T !
Include NITRATE? (LVNO3) -- Default: T ! LVNO3 = T !
Include ORGANIC CARBON? (LVOC) -- Default: T ! LVOC = T !
Include COARSE PARTICLES? (LVPMC) -- Default: T ! LVPMC = T !
Include FINE PARTICLES? (LVPMF) -- Default: T ! LVPMF = T !
Include ELEMENTAL CARBON? (LVEC) -- Default: T ! LVEC = T !
Include NO2 absorption? (LVNO2) -- Default: F ! LVNO2 = T !
With Visibility Method 8 -- Default: T
FLAG (2008)

And, when ranking for TOP-N, TOP-50, and Exceedance tables,
Include BACKGROUND? (LVBK) -- Default: T ! LVBK = T !

Species name used for particulates in MODEL.DAT file
COARSE (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
FINE (SPECPMF) -- Default: PMF ! SPECPMF = PMF !

Extinction Efficiency (1/Mm per ug/m**3)
---
MODELED particulate species:
PM COARSE (EEPMC) -- Default: 0.6 ! EEPMC = 0.6 !
PM FINE (EEPMF) -- Default: 1.0 ! EEPMF = 1 !
BACKGROUND particulate species:
PM COARSE (EEPMCBK) -- Default: 0.6 ! EEPMCBK = 0.6 !
Other species:
AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4 = 3 !
AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3 = 3 !
ORGANIC CARBON (EEOC) -- Default: 4.0 ! EEOC = 4 !
SOIL (EESOIL)-- Default: 1.0 ! EESOIL = 1 !
ELEMENTAL CARBON (EEEC) -- Default: 10. ! EEEC = 10 !
NO2 GAS (EENO2) -- Default: .1755 ! EENO2 = 0.1755 !
Visibility Method 8:
AMMONIUM SULFATE (EESO4S) Set Internally (small)
AMMONIUM SULFATE (EESO4L) Set Internally (large)
AMMONIUM NITRATE (EENO3S) Set Internally (small)
AMMONIUM NITRATE (EENO3L) Set Internally (large)

ORGANIC CARBON (EEOCS) Set Internally (small)
ORGANIC CARBON (EEOCL) Set Internally (large)
SEA SALT (EESALT) Set Internally

Background Extinction Computation
---

Method used for the 24h-average of percent change of light extinction:
Hourly ratio of source light extinction / background light extinction
is averaged? (LAVER) -- Default: F ! LAVER = F !

Method used for background light extinction
(MVISBK) -- Default: 8 ! MVISBK = 8 !
FLAG (2008)

1 = Supply single light extinction and hygroscopic fraction
- Hourly F(RH) adjustment applied to hygroscopic background and modeled sulfate and nitrate

2 = Background extinction from speciated PM concentrations (A)
- Hourly F(RH) adjustment applied to observed and modeled sulfate and nitrate
- F(RH) factor is capped at F(RHMAX)

3 = Background extinction from speciated PM concentrations (B)
- Hourly F(RH) adjustment applied to observed and modeled sulfate and nitrate
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-hours

4 = Read hourly transmissometer background extinction measurements
- Hourly F(RH) adjustment applied to modeled sulfate and nitrate
- Hour excluded if measurement invalid (missing, interference, or large RH)
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-hours

5 = Read hourly nephelometer background extinction measurements
- Rayleigh extinction value (BEXTRAY) added to measurement
- Hourly F(RH) adjustment applied to modeled sulfate and nitrate
- Hour excluded if measurement invalid (missing, interference, or large RH)
- Receptor-hour excluded if RH>RHMAX
- Receptor-day excluded if fewer than 6 valid receptor-hours

6 = Background extinction from speciated PM concentrations
- FLAG (2000) monthly RH adjustment factor applied to observed and and modeled sulfate and nitrate

7 = Use observed weather or prognostic weather information for background extinction during weather events; otherwise, use Method 2
- Hourly F(RH) adjustment applied to modeled sulfate and nitrate
- F(RH) factor is capped at F(RHMAX)
- During observed weather events, compute Bext from visual range if using an observed weather data file, or
- During prognostic weather events, use Bext from the prognostic weather file
- Use Method 2 for hours without a weather event

8 = Background extinction from speciated PM concentrations using the IMPROVE (2006) variable extinction efficiency formulation (MFRH must be set to 4)

- Split between small and large particle concentrations of SULFATES, NITRATES, and ORGANICS is a function of concentration and different extinction efficiencies are used for each
- Source-induced change in visibility includes the increase in extinction of the background aerosol due to the change in the extinction efficiency that now depends on total concentration.
- Fsmall(RH) and Flarge(RH) adjustments for small and large particles are applied to observed and modeled sulfate and nitrate concentrations
- Fsalt(RH) adjustment for sea salt is applied to background sea salt concentrations
- F(RH) factors are capped at F(RHMAX)
- RH for Fsmall(RH), Flarge(RH), and Fsalt(RH) may be obtained from hourly data as in Method 2 or from the FLAG monthly RH adjustment factor used for Method 6 where EPA F(RH) tabulation is used to infer RH, or monthly Fsmall, Flarge, and Fsalt RH adjustment factors can be directly entered.
  Furthermore, a monthly RH factor may be applied to either hourly concentrations or daily concentrations to obtain the 24-hour extinction.
  These choices are made using the M8_MODE selection.

Additional inputs used for MVISBK = 1:
---
Background light extinction (1/Mm)
(BEXTBK) -- No default ! BEXTBK = 12 !
Percentage of particles affected by relative humidity
(RHFRAC) -- No default ! RHFRAC = 10 !

Additional inputs used for MVISBK = 6,8:
---
Extinction coefficients for hygroscopic species (modeled and background) are computed using a monthly RH adjustment factor in place of an hourly RH factor (VISB.DAT file is NOT needed). Enter the 12 monthly factors here (RHFAC). Month 1 is January.

(RHFAC) -- No default ! RHFAC = 3.5, 3.3, 3.3, 3.3,
3.4, 3.6, 3.8, 3.8,
3.6, 3.4, 3.4, 3.5 !

Additional inputs used for MVISBK = 7:
---
The weather data file (DATSAV abbreviated space-delimited) that is identified as VSRN.DAT may contain data for more than one station. Identify the stations that are needed in the order in which they will be used to obtain valid weather and visual range. The first station that contains valid data for an hour will be used. Enter up to MXWSTA (set in PARAMS file) integer station IDs of up to 6 digits each as variable IDWSTA, and enter the corresponding time zone for each, as variable TZONE (= UTC-LST).

A prognostic weather data file with Bext for weather events may be used in place of the observed weather file. Identify this as the VSRN.DAT file and use a station ID of IDWSTA = 999999, and TZONE = 0.

NOTE: TZONE identifies the time zone used in the dataset. The

DATSAV abbreviated space-delimited data usually are prepared
with UTC time rather than local time, so TZONE is typically
set to zero.

```
(IDWSTA)   -- No default   * IDWSTA = 000000 *
(TZONE)    -- No default   * TZONE =      0. *
```

Additional inputs used for MVISBK = 2,3,6,7,8:
---
Background extinction coefficients are computed from monthly
CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3),
coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and
elemental carbon (BKEC). Month 1 is January.
(ug/m**3)

```
(BKSO4)  -- No default     ! BKSO4 = 0.23, 0.23, 0.23, 0.23,
                           0.23, 0.23, 0.23, 0.23,
                           0.23, 0.23, 0.23, 0.23 !
(BKNO3)  -- No default     ! BKNO3 = 0.10, 0.10, 0.10, 0.10,
                           0.10, 0.10, 0.10, 0.10,
                           0.10, 0.10, 0.10, 0.10 !
(BKPMC)  -- No default     ! BKPMC = 3.01, 3.01, 3.01, 3.01,
                           3.01, 3.01, 3.01, 3.01,
                           3.01, 3.01, 3.01, 3.01 !
(BKOC)   -- No default     ! BKOC  = 1.78, 1.78, 1.78, 1.78,
                           1.78, 1.78, 1.78, 1.78,
                           1.78, 1.78, 1.78, 1.78 !
(BKSOIL) -- No default     ! BKSOIL= 0.48, 0.48, 0.48, 0.48,
                           0.48, 0.48, 0.48, 0.48,
                           0.48, 0.48, 0.48, 0.48 !
(BKEC)   -- No default     ! BKEC  = 0.02, 0.02, 0.02, 0.02,
                           0.02, 0.02, 0.02, 0.02,
                           0.02, 0.02, 0.02, 0.02 !
```

Additional inputs used for MVISBK = 8:
---
Extinction coefficients for hygroscopic species (modeled and
background) may be computed using hourly RH values and hourly
modeled concentrations, or using monthly RH values inferred from
the RHFAC adjustment factors and either hourly or daily modeled
concentrations, or using monthly RHFSML, RHFLRG, and RHFSEA adjustment
factors and either hourly or daily modeled concentrations.

```
(M8_MODE) -- Default: 5     ! M8_MODE=  5   !
          FLAG (2008)
```

1 = Use hourly RH values from VISB.DAT file with hourly
modeled and monthly background concentrations.
2 = Use monthly RH from monthly RHFAC and EPA (2003) f(RH) tabulation
with hourly modeled and monthly background concentrations.
(VISB.DAT file is NOT needed).
3 = Use monthly RH from monthly RHFAC with EPA (2003) f(RH) tabulation
with daily modeled and monthly background concentrations.
(VISB.DAT file is NOT needed).
4 = Use monthly RHFSML, RHFLRG, and RHFSEA with hourly modeled
and monthly background concentrations.

(VISB.DAT file is NOT needed).
5 = Use monthly RHFSML, RHFLRG, and RHFSEA with daily modeled
and monthly background concentrations.
(VISB.DAT file is NOT needed).

Background extinction coefficients are computed from monthly
CONCENTRATIONS of sea salt (BKSALT). Month 1 is January.
(ug/m**3)

(BKSALT) -- No default ! BKSALT= 0.19, 0.19, 0.19, 0.19,
0.19, 0.19, 0.19, 0.19,
0.19, 0.19, 0.19, 0.19 !

Extinction coefficients for hygroscopic species (modeled and
background) can be computed using monthly RH adjustment factors
in place of an hourly RH factor (VISB.DAT file is NOT needed).
Enter the 12 monthly factors here (RHFSML,RHFLRG,RHFSEA).
Month 1 is January. (Used if M8_MODE = 4 or 5)

Small ammonium sulfate and ammonium nitrate particle sizes
(RHFSML) -- No default ! RHFSML= 4.08, 3.82, 3.79, 3.74,
3.94, 4.12, 4.41, 4.37,
4.18, 3.92, 3.93, 4.06 !

Large ammonium sulfate and ammonium nitrate particle sizes
(RHFLRG) -- No default ! RHFLRG= 2.91, 2.76, 2.74, 2.72,
2.83, 2.94, 3.10, 3.07,
2.97, 2.82, 2.83, 2.90 !

Sea salt particles
(RHFSEA) -- No default ! RHFSEA= 4.10, 3.89, 3.87, 3.85,
4.02, 4.21, 4.44, 4.38,
4.23, 3.99, 4.01, 4.11 !

Additional inputs used for MVISBK = 2,3,5,6,7,8:
---
Extinction due to Rayleigh scattering is added (1/Mm)
(BEXTRAY) -- Default: 10.0 ! BEXTRAY = 11 !

!END!
---

INPUT GROUP: 3 -- Output options
---

Documentation
---

Documentation records contained in the header of the
CALPUFF output file may be written to the list file.
Print documentation image?
(LDOC) -- Default: F ! LDOC = F !

Output Units
---

```
Units for All Output       (IPRTU) -- Default: 1   ! IPRTU =  3   !
                for            for
          Concentration    Deposition
  1 =        g/m**3         g/m**2/s
  2 =       mg/m**3        mg/m**2/s
  3 =       ug/m**3        ug/m**2/s
  4 =       ng/m**3        ng/m**2/s
  5 =      Odour Units

Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)


Averaging time(s) reported
--------------------------

  1-pd averages          (L1PD) -- Default: T   !   L1PD = F  !
  (pd = averaging period of model output)

  1-hr averages          (L1HR) -- Default: T   !   L1HR = F  !

  3-hr averages          (L3HR) -- Default: T   !   L3HR = F  !

  24-hr averages         (L24HR) -- Default: T   !  L24HR = T  !

  Run-length averages    (LRUNL) -- Default: T   !  LRUNL = F  !

  User-specified averaging time in hours, minutes, seconds
  - results for this averaging time are reported if it is not zero

                    (NAVGH) -- Default: 0   !   NAVGH =  0  !
                    (NAVGM) -- Default: 0   !   NAVGM =  0  !
                    (NAVGS) -- Default: 0   !   NAVGS =  0  !


Types of tabulations reported
-----------------------------

  1) Visibility: daily visibility tabulations are always reported
             for the selected receptors when ASPEC = VISIB.
             In addition, any of the other tabulations listed
             below may be chosen to characterize the light
             extinction coefficients.
             [List file or Plot/Analysis File]


  2) Top 50 table for each averaging time selected
    [List file only]
                    (LT50) -- Default: T   !   LT50 = F  !

  3) Top 'N' table for each averaging time selected
    [List file or Plot file]
                    (LTOPN) -- Default: F   !  LTOPN = F  !

     -- Number of 'Top-N' values at each receptor
       selected (NTOP must be <= 4)
                    (NTOP) -- Default: 4   ! NTOP =  4   !
```

-- Specific ranks of 'Top-N' values reported
(NTOP values must be entered)
(ITOP(4) array) -- Default: ! ITOP = 1,2,3,4 !
1,2,3,4

4) Threshold exceedance counts for each receptor and each averaging time selected
[List file or Plot file]
(LEXCD) -- Default: F ! LEXCD = F !

-- Identify the threshold for each averaging time by assigning a non-negative value (output units).

-- Default: -1.0
Threshold for 1-hr averages (THRESH1) ! THRESH1 = -1.0 !
Threshold for 3-hr averages (THRESH3) ! THRESH3 = -1.0 !
Threshold for 24-hr averages (THRESH24) ! THRESH24 = -1.0 !
Threshold for NAVG-hr averages (THRESHN) ! THRESHN = -1.0 !

-- Counts for the shortest averaging period selected can be tallied daily, and receptors that experience more than NCOUNT counts over any NDAY period will be reported. This type of exceedance violation output is triggered only if NDAY > 0.

Accumulation period(Days)
(NDAY) -- Default: 0 ! NDAY = 0 !
Number of exceedances allowed
(NCOUNT) -- Default: 1 ! NCOUNT = 1 !

5) Selected day table(s)

Echo Option -- Many records are written each averaging period selected and output is grouped by day
[List file or Plot file]
(LECHO) -- Default: F ! LECHO = F !

Timeseries Option -- Averages at all selected receptors for each selected averaging period are written to timeseries files. Each file contains one averaging period, and all receptors are written to a single record each averaging time.
[TSERIES_ASPEC_ttHR_CONC_TSUNAM.DAT files]
(LTIME) -- Default: F ! LTIME = F !

Peak Value Option -- Averages at all selected receptors for each selected averaging period are screened and the peak value each period is written to timeseries files.
Each file contains one averaging period.
[PEAKVAL_ASPEC_ttHR_CONC_TSUNAM.DAT files]
(LPEAK) -- Default: F ! LPEAK = F !

-- Days selected for output
(IECHO(366)) -- Default: 366*0

! IECHO = 366*0 !
(366 values must be entered)

Plot output options
---

Plot files can be created for the Top-N, Exceedance, and Echo tables selected above. Two formats for these files are available, DATA and GRID. In the DATA format, results at all receptors are listed along with the receptor location [x,y,val1,val2,...].
In the GRID format, results at only gridded receptors are written, using a compact representation. The gridded values are written in rows (x varies), starting with the most southern row of the grid.
The GRID format is given the .GRD extension, and includes headers compatible with the SURFER(R) plotting software.

A plotting and analysis file can also be created for the daily peak visibility summary output, in DATA format only.

Generate Plot file output in addition to writing tables to List file?
(LPLT) -- Default: F ! LPLT = F !

Use GRID format rather than DATA format, when available?
(LGRD) -- Default: F ! LGRD = F !

Auxiliary Output Files (for subsequent analyses)
---

Visibility

A separate output file may be requested that contains the change in visibility at each selected receptor when ASPEC = VISIB. This file can be processed to construct visibility measures that are not available in CALPOST.

Output file with the visibility change at each receptor?
(MDVIS) -- Default: 0 ! MDVIS = 1 !

0 = Do Not create file
1 = Create file of DAILY (24 hour) Delta-Deciview
2 = Create file of DAILY (24 hour) Extinction Change (%)
3 = Create file of HOURLY Delta-Deciview
4 = Create file of HOURLY Extinction Change (%)

Additional Debug Output
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Output selected information to List file for debugging?
(LDEBUG) -- Default: F ! LDEBUG = F !

Output hourly extinction information to REPORT.HRV?

(Visibility Method 7)
(LVEXTHR) -- Default: F  ! LVEXTHR = F !

!END!