Sources

How can I model multiple sources?

Stacks that emit the same pollutant with similar exit parameters and which are within about 100m of each other may be analyzed by treating all of the emissions as coming from a single representative stack. To determine the appropriate parameters to use for the "representative" stack, calculate the parameter M for each stack :

M = (Hs V Ts) / Q

where:

- M = merged stack parameter which accounts for the relative influence of stack height, plume rise , and emission rate on concentrations Hs = stack height [m]
- V = (pi/4) Ds^2 v = stack gas volumetric flow rate (m^3/s)
- Ds = inside stack diameter [m]
- v = stack gas exit velocity [m/s]
- Ts = stack gas exit temperature [K]
- Q = pollutant emission rate [g/s]

The stack that has the lowest value of M is used as a "representative" stack. The "representative" stack will have the following parameters :

- emission rate [g/s] -> Q= Q1 + Q2 + ... + Qn (sum of the emissions from all stacks)
- stack height [m] -> hs1 (stack height of the "representative" source)
- stack gas volumetric flow rate [m3/s] -> V1 (stack gas volumetric flow rate from "representative" source)
- stack gas exit temperature [K] -> Ts1 (stack gas exit temperature from "representative" source)

The above guidance is taken from "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised" (EPA -454/R-92-019, October 1992).

The parameters from dissimilar stacks should be merged with caution. Stacks should be located no more than 100m apart, and stack parameters should differ by no more than about 20%.

If stacks are not suitable candidates to be merged, they can be run individually in Screen and the resulting concentrations added together.

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