$$V\frac{d[C]}{dt} = Le + Li - VK[C]$$

where

V = the volume of water in the compartment (L)

$[C]$ = the total chemical concentration of V (mg/L)

Le = the total external loading on the compartment (mg/h)

Li = the total internal loading on the compartment resulting from contaminated flows among system compartments (mg/h)

K = overall pseudo-first-order chemical concentration loss constant on the combined effect of transport and transformation processes (h^{-1})