

## **DNAPL Calculation for Trichloroethylene**

$$C_{nap} = (S/2Pb)(Kd * Pb + THETA_w + H_{prime} * THETA_a)$$

$C_{nap}$  = concentrations of an organic substance which it may be present in non-aqueous phase form

$$C_{nap} = \mathbf{388,267 \text{ mg/kg}}$$

S = Constituent Solubility (mg/L)

$$S = 1000$$

Pb = Bulk Density (kg/L)

$$Pb = 1.5$$

Kd = soil-water partition coefficient or  $K_{oc} * f_{oc}$

$$Kd \text{ (calculated)} = 0.6$$

$K_{oc}$  = soil organic carbon-water partition coefficient

$$K_{oc} = 100$$

$f_{oc}$  = fraction organic carbon of soil

$$f_{oc} = 0.006$$

$THETA_w$  = water filled soil porosity ( $L_{water}/L_{soil}$ )

$$THETA_w = 0.15$$

$THETA_a$  = air filled soil porosity ( $L_{air}/L_{soil}$ )

$$THETA_a = 0.28$$

$H_{prime}$  = dimensionless Henry's Law Constant

$$H_{prime} = 0.41$$

H = Henry's Law Constant (atm-m<sup>3</sup>/mol)

$$H = 0.01$$

Volatile organic parameters are identified at USEPA website

## DNAPL Calculation for (cis) 1,2-Dichloroethylene

$$C_{nap} = (S/2Pb)(Kd * Pb + THETA_w + H_{prime} * THETA_a)$$

$C_{nap}$  = concentrations of an organic substance which it may be present in non-aqueous phase form

$$C_{nap} = \mathbf{598,136 \text{ mg/kg}}$$

S = Constituent Solubility (mg/L)

$$S = 3500$$

Pb = Bulk Density (kg/L)

$$Pb = 1.5$$

Kd = soil-water partition coefficient or  $K_{oc} * f_{oc}$

$$Kd \text{ (calculated)} = 0.216$$

Koc = soil organic carbon-water partition coefficient

$$K_{oc} = 36$$

foc = fraction organic carbon of soil

$$f_{oc} = 0.006$$

THETA<sub>w</sub> = water filled soil porosity (L<sub>water</sub>/L<sub>soil</sub>)

$$THETA_w = 0.15$$

THETA<sub>a</sub> = air filled soil porosity (L<sub>air</sub>/L<sub>soil</sub>)

$$THETA_a = 0.28$$

H<sub>prime</sub> = dimensionless Henry's Law Constant

$$H_{prime} = 0.13817$$

H = Henry's Law Constant (atm-m<sup>3</sup>/mol)

$$H = 0.00337$$

Volatile organic parameters are identified at USEPA website

## DNAPL Calculation for (trans) 1,2-Dichloroethylene

$$C_{nap} = (S/2Pb)(Kd * Pb + THETA_w + H_{prime} * THETA_a)$$

$C_{nap}$  = concentrations of an organic substance which it may be present in non-aqueous phase form

$$C_{nap} = \mathbf{1,076,644 \text{ mg/kg}}$$

S = Constituent Solubility (mg/L)

$$S = 6300$$

Pb = Bulk Density (kg/L)

$$Pb = 1.5$$

Kd = soil-water partition coefficient or  $K_{oc} * f_{oc}$

$$Kd \text{ (calculated)} = 0.216$$

Koc = soil organic carbon-water partition coefficient

$$K_{oc} = 36$$

foc = fraction organic carbon of soil

$$f_{oc} = 0.006$$

THETA<sub>w</sub> = water filled soil porosity (L<sub>water</sub>/L<sub>soil</sub>)

$$THETA_w = 0.15$$

THETA<sub>a</sub> = air filled soil porosity (L<sub>air</sub>/L<sub>soil</sub>)

$$THETA_a = 0.28$$

H<sub>prime</sub> = dimensionless Henry's Law Constant

$$H_{prime} = 0.13817$$

H = Henry's Law Constant (atm-m<sup>3</sup>/mol)

$$H = 0.00337$$

Volatile organic parameters are identified at USEPA website

**DNAPL Calculation for Vinyl Chloride**

$$C_{nap} = (S/2P_b)(K_d * P_b + \theta_{Aw} + H' * \theta_{Aa})$$

$C_{nap}$  = concentrations of an organic substance which it may be present in non-aqueous phase form

**$C_{nap} = 1,167,192 \text{ mg/kg}$**

S = Constituent Solubility (mg/L)

S = 2700

$P_b$  = Bulk Density (kg/L)

$P_b = 1.5$

$K_d$  = soil-water partition coefficient or  $K_{oc} * f_{oc}$

$K_d$  (calculated) = 0.336

$K_{oc}$  = soil organic carbon-water partition coefficient

$K_{oc} = 56$

$f_{oc}$  = fraction organic carbon of soil

$f_{oc} = 0.006$

$\theta_{Aw}$  = water filled soil porosity ( $L_{water}/L_{soil}$ )

$\theta_{Aw} = 0.15$

$\theta_{As}$  = air filled soil porosity ( $L_{air}/L_{soil}$ )

$\theta_{As} = 0.28$

$H'$  = dimensionless Henry's Law Constant

$H' = 2.296$

H = Henry's Law Constant (atm-m<sup>3</sup>/mol)

H = 0.056

Volatile organic parameters are identified at USEPA website