

DATA ENTRY SHEET

SG-ADV  
Version 3.1; 02/04

Reset to  
Defaults

Soil Gas Concentration Data

<b>ENTER</b> Chemical CAS No. (numbers only, no dashes)	<b>ENTER</b> Soil gas conc., $C_g$ ( $mg/m^3$ )	<b>OR</b>	<b>ENTER</b> Soil gas conc., $C_g$ (ppmv)	<b>ENTER</b> Chemical (numbers only, no dashes)
67663	2.00E+00			Chloroform 71432

**MORE**  
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<b>ENTER</b> Depth below grade to bottom of enclosed space floor, $L_F$ (cm)	<b>ENTER</b> Soil gas sampling depth below grade, $L_S$ (cm)	<b>ENTER</b> Average soil temperature, $T_S$ (°C)	<b>ENTER</b> Totals must add up to value of $L_S$ (cell F24)			<b>ENTER</b> Soil stratum A SCS soil type (used to estimate soil vapor permeability)	<b>ENTER</b> User-defined stratum A soil vapor permeability, $k_v$ ( $cm^2$ )
			<b>ENTER</b> Thickness of soil stratum A, $h_A$ (cm)	<b>ENTER</b> Thickness of soil stratum B, (Enter value or 0) $h_B$ (cm)	<b>ENTER</b> Thickness of soil stratum C, (Enter value or 0) $h_C$ (cm)	<b>OR</b>	
15	30	11	30			SL	

**MORE**  
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<b>ENTER</b> Stratum A SCS soil type Lookup Soil Parameters	<b>ENTER</b> Stratum A soil dry bulk density, $r_b^A$ ( $g/cm^3$ )	<b>ENTER</b> Stratum A soil porosity, $n^A$ (unitless)	<b>ENTER</b> Stratum A soil water-filled porosity, $q_w^A$ ( $cm^3/cm^3$ )	<b>ENTER</b> Stratum B SCS soil type Lookup Soil Parameters	<b>ENTER</b> Stratum B soil total bulk density, $r_b^B$ ( $g/cm^3$ )	<b>ENTER</b> Stratum B soil total porosity, $n^B$ (unitless)	<b>ENTER</b> Stratum B soil water-filled porosity, $q_w^B$ ( $cm^3/cm^3$ )	<b>ENTER</b> Stratum C SCS soil type Lookup Soil Parameters	<b>ENTER</b> Stratum C soil dry bulk density, $r_b^C$ ( $g/cm^3$ )	<b>ENTER</b> Stratum C soil total porosity, $n^C$ (unitless)	<b>ENTER</b> Stratum C soil water-filled porosity, $q_w^C$ ( $cm^3/cm^3$ )
SL	1.8315666	0.3036	0.15447168								

**MORE**  
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<b>ENTER</b> Enclosed space floor thickness, $L_{crack}$ (cm)	<b>ENTER</b> Soil-bldg. pressure differential, DP ( $g/cm-s^2$ )	<b>ENTER</b> Enclosed space floor length, $L_B$ (cm)	<b>ENTER</b> Enclosed space floor width, $W_B$ (cm)	<b>ENTER</b> Enclosed space height, $H_B$ (cm)	<b>ENTER</b> Floor-wall seam crack width, w (cm)	<b>ENTER</b> Indoor air exchange rate, ER (1/h)	<b>ENTER</b> Average vapor flow rate into bldg. OR Leave blank to calculate $Q_{soil}$ (L/m)
10	40	1000	1000	304.8	0.1	1	

<b>ENTER</b> Averaging time for carcinogens, $AT_C$ (yrs)	<b>ENTER</b> Averaging time for noncarcinogens, $AT_{NC}$ (yrs)	<b>ENTER</b> Exposure duration, ED (yrs)	<b>ENTER</b> Exposure frequency, EF (days/yr)
70	25	25	250

**END**

CHEMICAL PROPERTIES SHEET

Diffusivity in air, $D_a$ ( $\text{cm}^2/\text{s}$ )	Diffusivity in water, $D_w$ ( $\text{cm}^2/\text{s}$ )	Henry's law constant at reference temperature, H ( $\text{atm}\cdot\text{m}^3/\text{mol}$ )	Henry's law constant reference temperature, $T_R$ ( $^\circ\text{C}$ )	Enthalpy of vaporization at the normal boiling point, $DH_{v,b}$ ( $\text{cal}/\text{mol}$ )	Normal boiling point, $T_B$ ( $^\circ\text{K}$ )	Critical temperature, $T_C$ ( $^\circ\text{K}$ )	Molecular weight, MW ( $\text{g}/\text{mol}$ )	Unit risk factor, URF ( $\text{ng}/\text{m}^3$ ) <sup>-1</sup>	Reference conc., RfC ( $\text{mg}/\text{m}^3$ )
1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	119.38	2.3E-05	0.0E+00

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, t (sec)	Source-building separation, L <sub>T</sub> (cm)	Stratum A soil air-filled porosity, q <sub>a</sub> <sup>A</sup> (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum B soil air-filled porosity, q <sub>a</sub> <sup>B</sup> (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum C soil air-filled porosity, q <sub>a</sub> <sup>C</sup> (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum A effective total fluid saturation, S <sub>te</sub> (cm <sup>3</sup> /cm <sup>3</sup> )	Stratum A soil intrinsic permeability, k <sub>i</sub> (cm <sup>2</sup> )	Stratum A soil relative air permeability, k <sub>rg</sub> (cm <sup>2</sup> )	Stratum A soil effective vapor permeability, k <sub>v</sub> (cm <sup>2</sup> )	Floor-wall seam perimeter, X <sub>crack</sub> (cm)	Soil gas conc. (mg/m <sup>3</sup> )	Bldg. ventilation rate, Q <sub>building</sub> (cm <sup>3</sup> /s)
7.88E+08	15	0.149	ERROR	ERROR	0.436	5.94E-09	0.718	4.27E-09	4,000	2.00E+00	8.47E+04

Area of enclosed space below grade, A <sub>B</sub> (cm <sup>2</sup> )	Crack-to-total area ratio, h (unitless)	Crack depth below grade, Z <sub>crack</sub> (cm)	Enthalpy of vaporization at ave. soil temperature, DH <sub>v,TS</sub> (cal/mol)	Henry's law constant at ave. soil temperature, H <sub>TS</sub> (atm·m <sup>3</sup> /mol)	Henry's law constant at ave. soil temperature, H' <sub>TS</sub> (unitless)	Vapor viscosity at ave. soil temperature, η <sub>s</sub> (g/cm-s)	Stratum A effective diffusion coefficient, D <sup>eff</sup> <sub>A</sub> (cm <sup>2</sup> /s)	Stratum B effective diffusion coefficient, D <sup>eff</sup> <sub>B</sub> (cm <sup>2</sup> /s)	Stratum C effective diffusion coefficient, D <sup>eff</sup> <sub>C</sub> (cm <sup>2</sup> /s)	Total overall effective diffusion coefficient, D <sup>eff</sup> <sub>T</sub> (cm <sup>2</sup> /s)	Diffusion path length, L <sub>d</sub> (cm)
1.06E+06	3.77E-04	15	7,544	1.95E-03	8.38E-02	1.76E-04	2.00E-03	0.00E+00	0.00E+00	2.00E-03	15

Convection path length, L <sub>p</sub> (cm)	Source vapor conc., C <sub>source</sub> (mg/m <sup>3</sup> )	Crack radius, r <sub>crack</sub> (cm)	Average vapor flow rate into bldg., Q <sub>soil</sub> (cm <sup>3</sup> /s)	Crack effective diffusion coefficient, D <sup>crack</sup> (cm <sup>2</sup> /s)	Area of crack, A <sub>crack</sub> (cm <sup>2</sup> )	Exponent of equivalent foundation Peclet number, exp(Pe <sup>f</sup> ) (unitless)	Infinite source indoor attenuation coefficient, a (unitless)	Infinite source bldg. conc., C <sub>building</sub> (mg/m <sup>3</sup> )	Unit risk factor, URF (mg/m <sup>3</sup> ) <sup>-1</sup>	Reference conc., RfC (mg/m <sup>3</sup> )
15	2.00E+00	0.10	4.28E+00	2.00E-03	4.00E+02	1.72E+23	4.91E-05	9.81E-05	2.3E-05	NA

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
5.5E-10	NA

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

SCROLL  
DOWN  
TO "END"

END