

DATA ENTRY SHEET

SG-ADV
Version 3.1; 02/04

Reset to
Defaults

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g (mg/m^3)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical	ENTER Chemical CAS No. (numbers only, no dashes)
71432	1.00E+02			Benzene	71432

MORE
↓

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

MORE
↓

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

MORE
↓

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

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

END

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/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, $DH_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Molecular weight, MW (g/mol)	Unit risk factor, URF (ng/m^3) ⁻¹	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	78.11	7.8E-06	3.0E-02

INTERMEDIATE CALCULATIONS SHEET

Exposure duration, t (sec)	Source-building separation, L _T (cm)	Stratum A soil air-filled porosity, q _a ^A (cm ³ /cm ³)	Stratum B soil air-filled porosity, q _a ^B (cm ³ /cm ³)	Stratum C soil air-filled porosity, q _a ^C (cm ³ /cm ³)	Stratum A effective total fluid saturation, S _{te} (cm ³ /cm ³)	Stratum A soil intrinsic permeability, k _i (cm ²)	Stratum A soil relative air permeability, k _{rg} (cm ²)	Stratum A soil effective vapor permeability, k _v (cm ²)	Floor-wall seam perimeter, X _{crack} (cm)	Soil gas conc. (mg/m ³)	Bldg. ventilation rate, Q _{building} (cm ³ /s)
7.88E+08	15	0.149	ERROR	ERROR	0.436	5.94E-09	0.718	4.27E-09	4,000	1.00E+02	8.47E+04

Area of enclosed space below grade, A _B (cm ²)	Crack-to-total area ratio, h (unitless)	Crack depth below grade, Z _{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, DH _{v,TS} (cal/mol)	Henry's law constant at ave. soil temperature, H _{TS} (atm·m ³ /mol)	Henry's law constant at ave. soil temperature, H' _{TS} (unitless)	Vapor viscosity at ave. soil temperature, η _s (g/cm-s)	Stratum A effective diffusion coefficient, D ^{eff} _A (cm ² /s)	Stratum B effective diffusion coefficient, D ^{eff} _B (cm ² /s)	Stratum C effective diffusion coefficient, D ^{eff} _C (cm ² /s)	Total overall effective diffusion coefficient, D ^{eff} _T (cm ² /s)	Diffusion path length, L _d (cm)
1.06E+06	3.77E-04	15	8,112	2.82E-03	1.21E-01	1.76E-04	1.69E-03	0.00E+00	0.00E+00	1.69E-03	15

Convection path length, L _p (cm)	Source vapor conc., C _{source} (mg/m ³)	Crack radius, r _{crack} (cm)	Average vapor flow rate into bldg., Q _{soil} (cm ³ /s)	Crack effective diffusion coefficient, D ^{crack} (cm ² /s)	Area of crack, A _{crack} (cm ²)	Exponent of equivalent foundation Peclet number, exp(Pe ^f) (unitless)	Infinite source indoor attenuation coefficient, a (unitless)	Infinite source bldg. conc., C _{building} (mg/m ³)	Unit risk factor, URF (mg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
15	1.00E+02	0.10	4.28E+00	1.69E-03	4.00E+02	2.93E+27	4.88E-05	4.88E-03	7.8E-06	3.0E-02

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)
9.3E-09	1.1E-04

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

SCROLL
DOWN
TO "END"

END