Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
ture Adult Recreational Scenario - CT
ithwest Prperties, Wells G&H Superfund Site, Operable Unit 2
erjona Auto Parts

		RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:					INCREMENTAL RISK CALCULATIONS:	
		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
71556	1,1,1-Trichloroethane	NA	NA	NA	1.33E+06	NA	NA	NA
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	1.70E+05	NA	NA	NA
79005	1,1,2-Trichloroethane	NA	NA	NA	4.42E+06	NA	NA	NA
75343	1,1-Dichloroethane	NA	NA	NA	5.06E+06	NA	NA	NA
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	6.0E-09
120821	1,2,4-Trichlorobenzene	NA	NA	NA	3.00E+05	NA	NA	NA
95501	1,2-Dichlorobenzene	NA	NA	NA	2.77E+07	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	6.88E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	3.9E-10
78933	Butanone, 2- (MEK)	NA	NA	NA	2.23E+08	NA	NA	NA
67641	Acetone	NA	NA	NA	1.00E+09	NA	NA	NA
71432	Benzene	NA	NA	NA	1.75E+06	NA	4.2E-13	1.8E-08
74839	Bromomethane	NA	NA	NA	1.52E+07	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	2.67E+06	NA	NA	NA
108907	Chlorobenzene	NA	NA	NA	4.72E+05	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	5.32E+06	NA	NA	NA
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	5.2E-08
110827	Cyclohexane	NA	NA	NA	5.50E+04	NA	NA	NA
100414	Ethylbenzene	NA	NA	NA	1.69E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	5.60E+04	NA	NA	NA
108872	Methyl cyclohexane	NA	NA	NA	1.40E+04	NA	NA	NA
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	5.10E+07	NA	NA	5.6E-10
75092	Methylene chloride	NA	NA	NA	1.30E+07	NA	NA	NA
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	1.4E-12	NA
108883	Toluene	NA	NA	NA	5.26E+05	NA	NA	NA
156605	trans-1,2-Dichloroethylene	NA	NA	NA	6.30E+06	NA	NA	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	3.0E-10	6.8E-07
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	2.6E-12	2.9E-08
1330207	Xylenes	NA	NA	NA	2.20E+05	NA	NA	NA
98862	Acetophenone	NA	NA	NA	6.13E+06	NA	NA	NA
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	5.0E-08
91576	Methylnaphthalene, 2-	NA	NA	NA	2.46E+04	NA	NA	NA
92524	Biphenyl, 1,1'-	NA	NA	NA	6.94E+03	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.93E+03	NA	NA	NA
83329	Acenaphthene	NA	NA	NA	4.24E+03	NA	NA	NA
86737	Fluorene	NA	NA	NA	1.90E+03	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	5.8E-08
120127	Anthracene	NA	NA	NA	4.34E+01	NA	NA	NA
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.00E+04	NA	NA	NA
C11-C22	C11-C22 Aromatics	NA	NA	NA	5.80E+06	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	1.10E+07	NA	NA	NA
C9-C10	C9-C10 Aromatics	NA	NA	NA	5.10E+07	NA	NA	NA
C9-C12	C9-C12 Aliphatics	NA	NA	NA	7.00E+04	NA	NA	NA

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	3E-10	9E-07

[ ] = Cancer risk > 1E-05 or HQ/HI>1E+00

END

Appendix C 4
Johnson & Ettinger Model - Data Entry Screen
Intrusion of Volatiles from Groundwater
Current Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberdene Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_w (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Coversion factor CF (hr/yr)
75354	1,1-Dichloroethylene	1.66E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
106467	1,4-Dichlorobenzene	4.84E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
71432	Benzene	2.82E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
67663	Chloroform		15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
156592	cis-1,2-Dichloroethylene	2.56E+01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
1634044	Methyl-Tertiary-Butyl Ether	1.26E+01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
127184	Tetrachloroethylene	4.18E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
79016	Trichloroethylene	2.50E+01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
75014	Vinyl chloride	2.32E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
91203	Naphthalene	2.70E+00	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
83329	Acenaphthene		15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760
85018	Phenanthrene	2.19E+00	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	25	25	250	8	8760

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1,324	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	12,155	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_e (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{ra} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,w}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)
75354	1,1-Dichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	6,392	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	11,249	8.89E-04	3.83E-02
71432	Benzene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	8,122	2.69E-03	1.16E-01
67663	Chloroform	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	7,554	1.86E-03	8.02E-02
156592	cis-1,2-Dichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	7,704	2.04E-03	8.77E-02
1634044	Methyl-Tertiary-Butyl Ether	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	1,447	5.16E-04	2.22E-02
127184	Tetrachloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	9,553	7.83E-03	3.37E-01
79016	Trichloroethylene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	8,557	4.78E-03	2.06E-01
75014	Vinyl chloride	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	5,000	1.73E-02	7.46E-01
91203	Naphthalene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	12,913	1.52E-04	6.55E-03
83329	Acenaphthene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	16,123	3.67E-05	1.58E-03
85018	Phenanthrene	67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.00E+06	3.77E-04	15	1,479	1.14E-04	4.90E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Oper
Aberjona Auto Parts

		Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_{v} (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_{T} (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_v (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	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, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.37E-04	67.6	15	1.07E+02	0.09	6.30E+00	5.47E-04	3.77E+02	7.77E+198	1.38E-04	1.48E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.31E-04	67.6	15	1.85E+01	0.09	6.30E+00	4.38E-04	3.77E+02	1.46E+248	1.25E-04	2.31E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.32E-04	67.6	15	3.26E+01	0.09	6.30E+00	5.42E-04	3.77E+02	7.60E+200	1.38E-04	4.49E-03	7.8E-06	3.0E-02
67663	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.31E-04	67.6	15	N/A	0.09	6.30E+00	6.43E-04	3.77E+02	2.16E+168	1.48E-04	N/A	2.3E-05	3.0E-02
156592	cis-1,2-Dichloroethylene	1.75E-04	4.59E-04	4.30E-04	4.50E-04	67.6	15	2.26E+03	0.09	6.30E+00	4.59E-04	3.77E+02	1.59E+237	1.27E-04	2.89E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1.75E-04	6.67E-04	6.26E-04	6.56E-04	67.6	15	2.77E+02	0.09	6.30E+00	6.67E-04	3.77E+02	1.31E+163	1.50E-04	4.17E-02	N/A	3.0E+00
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.31E-04	67.6	15	1.41E+02	0.09	6.30E+00	4.39E-04	3.77E+02	9.76E+247	1.25E-04	1.76E-02	5.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.74E-04	67.6	15	5.18E+03	0.09	6.30E+00	4.83E-04	3.77E+02	1.64E+225	1.31E-04	6.74E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.32E-04	67.6	15	1.73E+02	0.09	6.30E+00	6.44E-04	3.77E+02	8.74E+168	1.48E-04	2.57E-02	8.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.64E-04	67.6	15	1.77E+01	0.09	6.30E+00	4.70E-04	3.77E+02	3.45E+231	1.29E-04	2.29E-03	N/A	3.0E-03
83329	Acenaphthene	1.75E-04	7.33E-04	7.31E-04	7.33E-04	67.6	15	N/A	0.09	6.30E+00	7.33E-04	3.77E+02	2.23E+148	1.57E-04	N/A	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.47E-04	67.6	15	1.03E+01	0.09	6.30E+00	3.50E-04	3.77E+02	#NUM!	1.11E-04	1.15E-03	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:					INCREMENTAL RISK CALCULATIONS:	
		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	1.7E-05
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	6.6E-07
71432	Benzene	NA	NA	NA	1.75E+06	NA	2.9E-09	3.4E-05
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	3.3E-04
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	5.10E+07	NA	NA	3.2E-06
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	8.4E-09	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	6.0E-06	3.8E-03
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	1.8E-08	5.9E-05
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	1.7E-04
83329	Acenaphthene	NA	NA	NA	4.24E+03	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	8.7E-05

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	6E-06	5E-03

[ ] = Cancer risk > 1E-05 or HQ/HI>1E+00

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberdons Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_w (ug/L)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Coversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	7.85E-02	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
106467	1,4-Dichlorobenzene	4.00E-02	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
71432	Benzene	4.00E-02	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
67663	Chloroform		15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
156592	cis-1,2-Dichloroethylene	5.00E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
1634044	Methyl-Tertiary-Butyl Ether	5.00E+00	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
127184	Tetrachloroethylene	4.18E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
79016	Trichloroethylene	5.00E-01	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
75014	Vinyl chloride	4.00E-02	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
91203	Naphthalene	1.32E+00	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
83329	Acenaphthene		15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760
85018	Phenanthrene	2.10E+00	15	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	9	9	219	8	8760

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1,324	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	12,155	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Screen

ınd Site, Operable Unit 2

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15
67.6	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.06E+06	3.77E-04	15

C.4
& Ettinger Model - Calculations Screen
of Volatiles from Groundwater
ommercial Scenario - CT
:t Prperties, Wells G&H Superfund Site, Ope
Auto Parts

	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_{V} (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_{T} (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	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, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)
roethylene	1.75E-04	5.47E-04	5.12E-04	5.37E-04	67.6	15	4.98E+01	0.10	6.36E+00	5.47E-04	4.00E+02	3.54E+189	1.43E-04	7.10E-03
robenzene	1.75E-04	4.38E-04	4.12E-04	4.31E-04	67.6	15	1.53E+00	0.10	6.36E+00	4.38E-04	4.00E+02	3.22E+236	1.29E-04	1.97E-04
n	1.75E-04	5.42E-04	5.07E-04	5.32E-04	67.6	15	4.63E+00	0.10	6.36E+00	5.42E-04	4.00E+02	2.79E+191	1.42E-04	6.58E-04
chloroethylene	1.75E-04	6.43E-04	6.02E-04	6.31E-04	67.6	15	N/A	0.10	6.36E+00	6.43E-04	4.00E+02	2.41E+161	1.52E-04	N/A
rtiary-Butyl Ether	1.75E-04	4.59E-04	4.30E-04	4.50E-04	67.6	15	4.39E+01	0.10	6.36E+00	4.59E-04	4.00E+02	1.15E+226	1.32E-04	5.78E-03
oethylene	1.75E-04	6.67E-04	6.28E-04	6.56E-04	67.6	15	1.11E+02	0.10	6.36E+00	6.67E-04	4.00E+02	2.87E+155	1.55E-04	1.72E-02
thylene	1.75E-04	4.39E-04	4.11E-04	4.31E-04	67.6	15	1.41E+02	0.10	6.36E+00	4.39E-04	4.00E+02	2.20E+236	1.29E-04	1.82E-02
ride	1.75E-04	4.83E-04	4.52E-04	4.74E-04	67.6	15	1.03E+02	0.10	6.36E+00	4.83E-04	4.00E+02	4.34E+214	1.35E-04	1.39E-02
ne	1.75E-04	6.44E-04	6.02E-04	6.32E-04	67.6	15	2.98E+01	0.10	6.36E+00	6.44E-04	4.00E+02	1.02E+161	1.53E-04	4.55E-03
hene	1.75E-04	4.70E-04	4.50E-04	4.64E-04	67.6	15	8.64E+00	0.10	6.36E+00	4.70E-04	4.00E+02	4.60E+220	1.34E-04	1.15E-03
rene	1.75E-04	7.33E-04	7.31E-04	7.33E-04	67.6	15	N/A	0.10	6.36E+00	7.33E-04	4.00E+02	2.40E+141	1.61E-04	N/A
	1.75E-04	3.50E-04	3.41E-04	3.47E-04	67.6	15	1.03E+01	0.10	6.36E+00	3.50E-04	4.00E+02	4.27E+296	1.15E-04	1.19E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Commercial Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

	Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354 1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	7.1E-06
106467 1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	4.9E-08
71432 Benzene	NA	NA	NA	1.75E+06	NA	1.3E-10	4.4E-06
67663 Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592 cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	5.8E-06
1634044 Methyl-Tertiary-Butyl Ether	NA	NA	NA	5.10E+07	NA	NA	1.1E-06
127184 Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	2.8E-09	NA
79016 Trichloroethylene	NA	NA	NA	1.10E+06	NA	3.9E-08	7.0E-05
75014 Vinyl chloride	NA	NA	NA	2.76E+06	NA	1.0E-09	9.1E-06
91203 Naphthalene	NA	NA	NA	3.10E+04	NA	NA	7.7E-05
83329 Acenaphthene	NA	NA	NA	4.24E+03	NA	NA	NA
85018 Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	7.9E-05

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	4E-08	3E-04

= Cancer risk > 1E-05 or HQ/HI>1E+00

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_w (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil groundwater temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	1.94E-01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
106467	1,4-Dichlorobenzene	4.84E-01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
71432	Benzene	1.00E-01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
67663	Chloroform		52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
156592	cis-1,2-Dichloroethylene	8.00E+00	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
127184	Tetrachloroethylene	4.15E-01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
79016	Trichloroethylene	2.50E+01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
75014	Vinyl chloride	2.40E-01	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
91203	Naphthalene	2.70E+00	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760
85018	Phenanthrene	2.10E+00	52.12	82.6	LS	10	LS	1		1.5	0.43	0.3	1.0E-06	1	70	6	6	350	16	8760

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,968	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79018	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^* (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a\,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w\,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v\,Tg}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{Tg} (atm-m^3/mol)	Henry's law constant at ve. groundwat temperature, H'_{Ts} (unitless)
75354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	6,392	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	11,243	8.89E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	8,122	2.63E-03	1.16E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	7,554	1.86E-03	8.02E-02
156592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	7,734	2.04E-03	8.77E-02
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	9,553	7.83E-03	3.37E-01
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	8,557	4.79E-03	2.06E-01
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	5,000	1.73E-02	7.46E-01
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	12,913	1.52E-04	6.55E-03
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.60E+06	2.22E-04	52.12	1,479	1.14E-04	4.90E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Vapor viscosity at ave. soil temperature, μ_{ms} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_v (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	1.23E+02	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+155	1.76E-04	2.16E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.85E+01	0.10	5.22E+00	4.38E-04	4.00E+02	1.36E+194	1.70E-04	3.15E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	1.16E+01	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+157	1.76E-04	2.03E-03	7.8E-06	3.0E-02
67663	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	9.8E-02
156592	cis-1,2-Dichloroethylene	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.39E-04	4.00E+02	9.83E+193	1.70E-04	2.39E-02	5.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.82E-04	4.52E-04	4.64E-04	30.48	52.12	5.16E+03	0.10	5.22E+00	4.82E-04	4.00E+02	1.52E+176	1.73E-04	8.90E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.79E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	3.22E-02	8.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.57E-04	30.48	52.12	1.77E+01	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	3.05E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.06E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	6.9E-05
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	2.5E-06
71432	Benzene	NA	NA	NA	1.75E+06	NA	8.7E-10	4.3E-05
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	3.8E-04
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	7.7E-09	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	5.4E-06	1.4E-02
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	1.6E-08	2.1E-04
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	6.5E-04
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	5E-06	2E-02

= Cancer risk > 1E-05 or HQ/HI>1E+00

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Intrusion of Volatiles from Groundwater
Current Child Residential Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberions Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_w (ug/L)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Coversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	1.17E-01	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
106467	1,4-Dichlorobenzene	4.30E-01	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
71432	Benzene	7.80E-02	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
67663	Chloroform		52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
156592	cis-1,2-Dichloroethylene	6.00E+00	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
127184	Tetrachloroethylene	4.15E-01	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
79016	Trichloroethylene	2.16E+01	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
75014	Vinyl chloride	1.97E-01	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
91203	Naphthalene	1.36E+00	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760
85018	Phenanthrene	2.10E+00	52.12	82.6	LS	10	LS		1		1.5	0.43	0.3	1.0E-06	1	70	2	2	350	16	8760

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_{ws}), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Child Resedential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberdare Auto Parts

		Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,w}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TW} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TW} (unitless)
75354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6,392	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	11,243	8.68E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8,122	2.69E-03	1.16E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7,554	1.86E-03	8.02E-02
156592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7,734	2.04E-03	8.77E-02
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	9,553	7.83E-03	3.37E-01
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8,557	4.79E-03	2.06E-01
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	5,000	1.73E-02	7.46E-01
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	12,913	1.52E-04	6.55E-03
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	1,479	1.14E-04	4.90E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Child Residential Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Abarjona Auto Parts

		Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_{v} (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_{T} (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	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, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	7.42E+01	0.10	5.22E+00	5.47E-04	4.00E+02	3.67E+155	1.76E-04	1.31E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.64E+01	0.10	5.22E+00	4.38E-04	4.00E+02	1.36E+194	1.70E-04	2.79E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	6.66E+00	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+157	1.76E-04	1.53E-03	7.8E-06	3.0E-02
67663	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	1.75E-04	4.96E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.39E-04	4.00E+02	8.93E+193	1.70E-04	2.39E-02	5.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	4.43E+03	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	7.66E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.47E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	2.64E-02	8.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.67E-04	30.48	52.12	8.86E+00	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+161	1.72E-04	1.53E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Child Resedential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:					INCREMENTAL RISK CALCULATIONS:	
		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	4.2E-05
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	2.2E-06
71432	Benzene	NA	NA	NA	1.75E+06	NA	2.2E-10	3.2E-05
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	3.8E-04
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	2.6E-09	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	1.5E-06	1.2E-02
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	4.2E-09	1.7E-04
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	3.3E-04
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-06	1E-02

[ ] = Cancer risk > 1E-05 or HQ/HI>1E+00

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Intrusion of Volatiles from Groundwater
Current Adult Residential Scenario - RME
Southwest Pioneer, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_w (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, LF (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	1.94E-01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
106467	1,4-Dichlorobenzene	4.84E-01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
71432	Benzene	1.00E-01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
67663	Chloroform		52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
156592	cis-1,2-Dichloroethylene	8.00E+00	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
127184	Tetrachloroethylene	4.15E-01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
79016	Trichloroethylene	2.50E+01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
75014	Vinyl chloride	2.40E-01	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
91203	Naphthalene	2.70E+00	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760
85018	Phenanthrene	2.10E+00	52.12	82.6	LS	10	LS	1		1.6	0.43	0.3	1.0E-06	1	70	24	24	350	16	8760

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberlona Auto Parts

		Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a\,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w\,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ve. groundwat temperature, H'_{TS} (unitless)
75354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	6,392	1.47E-02	6.34E-01
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	11,243	8.89E-04	3.83E-02
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8,122	2.69E-03	1.16E-01
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7,554	1.86E-03	8.02E-02
156592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	7,734	2.04E-03	8.77E-02
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	9,553	7.83E-03	3.37E-01
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	8,557	4.79E-03	2.06E-01
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	5,000	1.73E-02	7.46E-01
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	12,913	1.52E-04	6.55E-03
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04	1.80E+06	2.22E-04	52.12	1,479	1.14E-04	4.90E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_{v} (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_{T} (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	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) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	1.23E+02	0.10	5.22E+00	5.47E-04	4.00E+02	3.87E+155	1.76E-04	2.16E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.85E+01	0.10	5.22E+00	4.39E-04	4.00E+02	1.36E+194	1.70E-04	3.15E-03	N/A	8.0E-01
71432	Benzene	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	1.16E+01	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+157	1.75E-04	2.03E-03	7.8E-06	3.0E-02
67663	Chloroform	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	N/A	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	9.8E-02
156592	cis-1,2-Dichloroethylene	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+165	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02	0.10	5.22E+00	4.39E-04	4.00E+02	9.93E+193	1.70E-04	2.39E-02	5.9E-06	N/A
79016	Trichloroethylene	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	5.16E+03	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	8.90E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.79E+02	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	3.22E-02	8.8E-06	1.0E-01
91203	Naphthalene	1.75E-04	4.70E-04	4.50E-04	4.57E-04	30.48	52.12	1.77E+01	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	3.03E-03	N/A	3.0E-03
85018	Phenanthrene	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	6.9E-05
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	2.5E-06
71432	Benzene	NA	NA	NA	1.75E+06	NA	3.5E-09	4.3E-05
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	3.8E-04
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	3.1E-08	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	2.1E-05	1.4E-02
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	6.2E-08	2.1E-04
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	6.5E-04
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-05	2E-02

[ ] = Cancer risk > 1E-05 or HQ/HI>1E+00

END

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	ENTER 95% UCL groundwater conc., C_W (µg/L)	ENTER Depth below grade to bottom of enclosed space floor, LF (15 or 200 cm)	ENTER Depth below grade to water table, LWT (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)
75354	1,1-Dichloroethylene	1.17E-01	52.12	82.6	LS	10	LS	1		1.5	0.43
106467	1,4-Dichlorobenzene	4.30E-01	52.12	82.6	LS	10	LS	1		1.5	0.43
71432	Benzene	7.50E-02	52.12	82.6	LS	10	LS	1		1.5	0.43
67663	Chloroform		52.12	82.6	LS	10	LS	1		1.5	0.43
156592	cis-1,2-Dichloroethylene	8.00E+00	52.12	82.6	LS	10	LS	1		1.5	0.43
127184	Tetrachloroethylene	4.18E-01	52.12	82.6	LS	10	LS	1		1.5	0.43
79016	Trichloroethylene	2.15E+01	52.12	82.6	LS	10	LS	1		1.5	0.43
75014	Vinyl chloride	1.97E-01	52.12	82.6	LS	10	LS	1		1.5	0.43
91203	Naphthalene	1.35E+00	52.12	82.6	LS	10	LS	1		1.5	0.43
85018	Phenanthrene	2.10E+00	52.12	82.6	LS	10	LS	1		1.5	0.43

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), an

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

ENTER Chemical CAS No. (numbers only, no dashes)	Enter X in appro Chemical	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	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)	ENTER Exposure time ET (hrs/day)	ENTER Coversion factor CF (hrs/yr)
75354	1,1-Dichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
106467	1,4-Dichlorobenzene	0.3	1.0E-06	1	70	7	7	350	16	8760
71432	Benzene	0.3	1.0E-06	1	70	7	7	350	16	8760
67663	Chloroform	0.3	1.0E-06	1	70	7	7	350	16	8760
156592	cis-1,2-Dichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
127184	Tetrachloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
79016	Trichloroethylene	0.3	1.0E-06	1	70	7	7	350	16	8760
75014	Vinyl chloride	0.3	1.0E-06	1	70	7	7	350	16	8760
91203	Naphthalene	0.3	1.0E-06	1	70	7	7	350	16	8760
85018	Phenanthrene	0.3	1.0E-06	1	70	7	7	350	16	8760

1 soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Chemical Properties Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

Chemical CAS No.	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9,271	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02
67663	Chloroform	1.04E-01	1.00E-05	3.66E-03	25	6,988	334.32	536.40	3.98E+01	7.92E+03	2.3E-05	5.0E-02
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8,288	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	10,373	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1,057	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, Xcrack (cm)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
75354	1,1-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
106467	1,4-Dichlorobenzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
71432	Benzene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
67663	Chloroform	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
156592	cis-1,2-Dichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
127184	Tetrachloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
79016	Trichloroethylene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
75014	Vinyl chloride	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
91203	Naphthalene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04
85018	Phenanthrene	30.48	0.130	0.659	1.62E-08	0.390	6.33E-09	18.75	0.43	0.127	0.303	4.00E+03	2.54E+04

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ve. groundwat temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)
75354	1,1-Dichloroethylene	1.80E+06	2.22E-04	52.12	6,392	1.47E-02	6.34E-01	1.75E-04	5.47E-04	5.12E-04	5.25E-04	30.48	52.12	7.42E+01
106467	1,4-Dichlorobenzene	1.80E+06	2.22E-04	52.12	11,243	8.89E-04	3.83E-02	1.75E-04	4.38E-04	4.12E-04	4.22E-04	30.48	52.12	1.64E+01
71432	Benzene	1.80E+06	2.22E-04	52.12	8,122	2.69E-03	1.16E-01	1.75E-04	5.42E-04	5.07E-04	5.20E-04	30.48	52.12	8.68E+00
67663	Chloroform	1.80E+06	2.22E-04	52.12	7,554	1.86E-03	8.02E-02	1.75E-04	6.43E-04	6.02E-04	6.17E-04	30.48	52.12	
156592	cis-1,2-Dichloroethylene	1.80E+06	2.22E-04	52.12	7,734	2.04E-03	8.77E-02	1.75E-04	4.59E-04	4.30E-04	4.41E-04	30.48	52.12	7.02E+02
127184	Tetrachloroethylene	1.80E+06	2.22E-04	52.12	9,553	7.83E-03	3.37E-01	1.75E-04	4.39E-04	4.11E-04	4.21E-04	30.48	52.12	1.41E+02
79016	Trichloroethylene	1.80E+06	2.22E-04	52.12	8,657	4.79E-03	2.06E-01	1.75E-04	4.83E-04	4.52E-04	4.64E-04	30.48	52.12	4.43E+03
75014	Vinyl chloride	1.80E+06	2.22E-04	52.12	5,000	1.73E-02	7.46E-01	1.75E-04	6.44E-04	6.02E-04	6.18E-04	30.48	52.12	1.47E+02
91203	Naphthalene	1.80E+06	2.22E-04	52.12	12,913	1.52E-04	6.55E-03	1.75E-04	4.70E-04	4.50E-04	4.57E-04	30.48	52.12	8.86E+00
85018	Phenanthrene	1.80E+06	2.22E-04	52.12	1,479	1.14E-04	4.90E-03	1.75E-04	3.50E-04	3.41E-04	3.44E-04	30.48	52.12	1.03E+01

Appendix C.4
Johnson & Ettinger Model - Calculations Screen
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		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, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
75354	1,1-Dichloroethylene	0.10	5.22E+00	6.47E-04	4.00E+02	3.87E+155	1.76E-04	1.31E-02	N/A	2.0E-01
106467	1,4-Dichlorobenzene	0.10	5.22E+00	4.38E-04	4.00E+02	1.36E+194	1.70E-04	2.79E-03	N/A	8.0E-01
71432	Benzene	0.10	5.22E+00	5.42E-04	4.00E+02	1.40E+157	1.76E-04	1.53E-03	7.8E-06	3.0E-02
67663	Chloroform	0.10	5.22E+00	6.43E-04	4.00E+02	2.93E+132	1.80E-04	N/A	2.3E-05	9.8E-02
156592	cis-1,2-Dichloroethylene	0.10	5.22E+00	4.59E-04	4.00E+02	3.62E+185	1.71E-04	1.20E-01	N/A	2.0E-01
127184	Tetrachloroethylene	0.10	5.22E+00	4.39E-04	4.00E+02	9.93E+193	1.70E-04	2.39E-02	5.9E-06	N/A
79016	Trichloroethylene	0.10	5.22E+00	4.83E-04	4.00E+02	1.52E+176	1.73E-04	7.66E-01	1.1E-04	4.0E-02
75014	Vinyl chloride	0.10	5.22E+00	6.44E-04	4.00E+02	1.44E+132	1.80E-04	2.64E-02	8.8E-06	1.0E-01
91203	Naphthalene	0.10	5.22E+00	4.70E-04	4.00E+02	1.34E+181	1.72E-04	1.53E-03	N/A	3.0E-03
85018	Phenanthrene	0.10	5.22E+00	3.50E-04	4.00E+02	3.05E+243	1.64E-04	1.68E-03	N/A	3.0E-03

Appendix C.4
Johnson & Ettinger Model - Results
Inhalation of Volatiles from Groundwater
Current Adult Residential Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Aberjona Auto Parts

		RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:					INCREMENTAL RISK CALCULATIONS:	
		Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final Indoor exposure groundwater conc., (µg/L)	Incremental risk from vapor intrusion to Indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
75354	1,1-Dichloroethylene	NA	NA	NA	2.25E+06	NA	NA	4.2E-05
106467	1,4-Dichlorobenzene	NA	NA	NA	7.38E+04	NA	NA	2.2E-06
71432	Benzene	NA	NA	NA	1.75E+06	NA	7.6E-10	3.2E-05
67663	Chloroform	NA	NA	NA	7.92E+06	NA	NA	NA
156592	cis-1,2-Dichloroethylene	NA	NA	NA	3.50E+06	NA	NA	3.8E-04
127184	Tetrachloroethylene	NA	NA	NA	2.00E+05	NA	9.0E-09	NA
79016	Trichloroethylene	NA	NA	NA	1.10E+06	NA	5.4E-06	1.2E-02
75014	Vinyl chloride	NA	NA	NA	2.76E+06	NA	1.5E-08	1.7E-04
91203	Naphthalene	NA	NA	NA	3.10E+04	NA	NA	3.3E-04
85018	Phenanthrene	NA	NA	NA	1.28E+03	NA	NA	3.6E-04

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	5E-06	1E-02

[ ] = Cancer risk > 1E-05 or HQ/HI>1E+00

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box) — SL-SCREEN Version 2.3; 03/01

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration. ENTER Mean soil conc., C_R (µg/kg)	ENTER Depth below grade to bottom of enclosed space floor, L_F (1.5 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm²)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm³)	ENTER Vadose zone soil total porosity, n^A (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^A (cm³/cm³)	ENTER Vadose zone soil organic carbon fraction, f_oc^A (unitless)	ENTER Averaging time for carcinogens, ATC (yrs)	ENTER Averaging time for noncarcinogens, ATNC (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time, ET (hrs/day)	ENTER Cancer slope factor, CSF (mg/kg-day)⁻¹	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
95636	Trimethylbenzene, 1,2,4-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
540590	Dichloroethylene, 1,2- (total)		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
108678	Trimethylbenzene, 1,3,5-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
104518	n-Butylbenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
91203	Naphthalene	2.74E+03	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
99878	Isopropyltoluene, 4-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
135988	Butylbenzene, sec-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
74873	Chloromethane	2.49E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75014	Vinyl chloride	2.81E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
74839	Bromomethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75003	Ethyl Chloride	8.80E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75354	1,1-Dichloroethylene	1.20E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
67641	Acetone	3.24E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75150	Carbon Disulfide		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
79209	Methyl Acetate		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75092	Methylene chloride	7.27E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
156605	trans-1,2-Dichloroethylene	7.73E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
1634044	Methyl-Tertiary-Butyl Ether	5.75E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
75343	1,1-Dichloroethane	5.56E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
156592	cis-1,2-Dichloroethylene	1.80E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
78933	Butanone, 2- (MEK)		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
71556	1,1,1-Trichloroethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
110827	Cyclohexane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
71432	Benzene	2.10E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
79016	Trichloroethylene	2.91E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
1566672	Methyl cyclohexane	4.45E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
108883	Toluene	5.65E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
127184	Tetrachloroethylene	1.47E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
108907	Chlorobenzene	3.11E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
100414	Ethylbenzene	1.84E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
1330207	Xylenes		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
100425	Styrene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
98828	Isopropylbenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
79345	1,1,2,2-Tetrachloroethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
541731	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
106467	1,4-Dichlorobenzene	2.50E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
95501	1,2-Dichlorobenzene	5.10E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
120821	1,2,4-Trichlorobenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
100527	Benzaldehyde		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
91576	Methylnaphthalene, 2-	8.41E+03	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
92524	Biphenyl, 1,1'-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
208968	Acenaphthylene	4.00E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
83329	Acenaphthene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
132649	Dibenzofuran	1.79E+03	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
86737	Fluorene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
85018	Phenanthrene	3.66E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
120127	Anthracene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
C5-C8	C5-C8 Aliphatics	9.83E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
C9-C12	C9-C12 Aliphatics	8.11E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
C9-C10	C9-C10 Aromatics	4.31E+06	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
C9-C18	C9-C18 Aliphatics	6.04E+06	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1
C11-C22	C11-C22 Aromatics	4.10E+06	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	25	25	250	8	8760	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.76E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, Xcrack (cm)	Initial soil concentration used, CR (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (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, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)
95636	Trimethylbenzene, 1,2,4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.62E+06	9.50E+06	1.30E-04	15	1.55E+03	4.98E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.62E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.62E+06	9.50E+06	1.30E-04	15	1.55E+03	6.60E-03	2.93E-01	1.75E-04	3.96E-04
104518	n-Butylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.63E+03	2.62E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.62E+06	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.62E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.62E+06	9.50E+06	1.30E-04	15	1.53E+03	1.46E-02	6.27E-01	1.75E-04	4.86E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.62E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.66E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.62E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.69E+06	2.62E+06	9.50E+06	1.30E-04	15	5.39E+03	3.64E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.60E+01	2.62E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.66E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.20E+02	2.62E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	6.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.62E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.62E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.62E+06	9.50E+06	1.30E-04	15	6.68E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.62E+06	9.50E+06	1.30E-04	15	1.50E+03	9.86E-05	4.25E-03	1.75E-04	6.61E-04
75092	Methylene chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.62E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	6.35E-04
156605	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.62E+06	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.62E+06	9.50E+06	1.30E-04	15	1.45E+03	5.16E-04	2.22E-02	1.75E-04	6.67E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.62E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.56E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.62E+06	9.50E+06	1.30E-04	15	7.79E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.63E+07	2.62E+06	9.50E+06	1.30E-04	15	1.48E+03	5.49E-05	2.11E-03	1.75E-04	9.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.01E+05	2.62E+06	9.50E+06	1.30E-04	15	7.86E+03	8.50E-03	3.66E-01	1.75E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.62E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E+01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.10E+02	2.62E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.62E+06	9.50E+06	1.30E-04	15	8.58E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.62E+06	9.50E+06	1.30E-04	15	9.15E+03	2.92E-03	1.26E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.62E+06	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.62E+06	9.50E+06	1.30E-04	15	9.80E+03	1.54E-03	6.65E-02	1.75E-04	4.56E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.62E+06	9.50E+06	1.30E-04	15	1.02E+04	3.16E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.50E+05	2.62E+06	9.50E+06	1.30E-04	15	1.54E+03	5.86E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.62E+06	9.50E+06	1.30E-04	15	1.05E+04	1.06E-03	4.67E-02	1.75E-04	4.47E-04
98828	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.62E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.95E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.16E+06	2.62E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.85E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.62E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.56E-04
106467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.62E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.38E-04
95501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.62E+06	9.50E+06	1.30E-04	15	1.21E+04	6.51E-07	2.37E-05	1.75E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.62E+06	9.50E+06	1.30E-04	15	1.32E+04	4.36E-04	1.87E-02	1.75E-04	2.25E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.62E+06	9.50E+06	1.30E-04	15	1.53E+03	2.29E-05	9.84E-04	1.75E-04	1.35E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.41E+03	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	8.86E-04	3.81E-02	1.75E-04	3.13E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.62E+06	9.50E+06	1.30E-04	15	1.47E+03	2.66E-04	1.14E-02	1.75E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.62E+06	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83329	Acenaphthene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.62E+06	9.50E+06	1.30E-04	15	1.81E+04	3.67E-05	1.58E-03	1.75E-04	7.33E-04
132649	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.62E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	1.66E-04
86737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.97E+04	2.62E+06	9.50E+06	1.30E-04	15	1.62E+04	2.20E-06	9.48E-05	1.75E-04	8.16E-01
85018	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.62E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.62E+06	9.50E+06	1.30E-04	15	1.84E+04	1.26E-05	5.43E-04	1.75E-04	1.60E-03
C5-C8	C5-C8 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.83E+04	2.62E+06	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.64E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.62E+06	9.50E+06	1.30E-04	15	NA	7.80E-01	3.36E+01	1.75E-04	3.64E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.62E+06	9.50E+06	1.30E-04	15	NA	3.96E-03	1.70E-01	1.75E-04	3.69E-04
C9-C18	C9-C18 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.04E+06	2.62E+06	9.50E+06	1.30E-04	15	NA	8.28E-01	3.56E+01	1.75E-04	3.64E-04
C11-C22	C11-C22 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.10E+06	2.62E+06	9.50E+06	1.30E-04	15	NA	3.60E-04	1.55E-02	1.75E-04	4.27E-04

Appendix C 4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	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(Pef) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+303	1.08E-05	N/A	N/A	6.0E-03
540590	Dichloroethylene, 1,2- (total)	1	15	2.67E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.96E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-05	4.61E-02	N/A	3.0E-03
99876	Isopropyltoluene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.86E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.86E-02	3.24E+06	0.10	2.74E+01	7.86E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+06	0.10	2.74E+01	8.44E-04	1.23E+03	5.27E+224	1.08E-05	6.99E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.86E-02	N/A	0.10	2.74E+01	4.46E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.86E-02	1.12E+06	0.10	2.74E+01	7.86E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	2.04E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+284	1.08E-05	2.21E+00	N/A	2.0E-01
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67641	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.08E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-05	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	15	6.64E-03	N/A	0.10	2.74E+01	6.61E-04	1.23E+03	1.17E+168	1.08E-05	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	8.35E-04	1.23E+03	8.55E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
156605	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.58E+03	0.10	2.74E+01	6.67E-04	1.23E+03	9.48E+216	1.08E-05	4.96E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.62E+06	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
156592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.66E+04	0.10	2.74E+01	4.59E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.66E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.16E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+298	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.81E+267	1.08E-05	8.02E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+06	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	6.30E-01	3.35E+06	0.10	2.74E+01	5.98E-04	1.23E+03	1.50E+242	1.08E-05	3.62E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+06	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.82E-01	5.9E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.56E-04	1.23E+03	#NUM!	1.08E-05	3.46E-01	N/A	6.0E-02
100414	Ethylbenzene	1	15	7.28E-01	2.68E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.76E-03	1.23E+03	4.03E+35	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.98E+256	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.66E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.84E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.09E-05	4.25E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.56E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100527	Benzaldehyde	1	15	6.54E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.60E+107	1.08E-05	N/A	#N/A	#N/A
91576	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1-	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208968	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.64E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+187	1.08E-05	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.63E+01	1.84E+04	0.10	2.74E+01	1.66E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.16E-01	1.23E+03	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
85018	Phenanthrene	1	15	2.63E+01	6.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	6.76E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+90	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.63E+00	3.84E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.76E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.29E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.56E+00	1.95E+07	0.10	2.74E+01	3.69E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.39E+03	1.68E+08	0.10	2.74E+01	3.54E-04	1.23E+03	#NUM!	1.08E-05	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	8.23E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	6.72E+01	N/A	5.0E-02

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.38E+05	NA	NA	NA
540590	Dichloroethylene, 1,2- (total)	NA	NA	NA	5.96E+02	NA	NA	NA
108678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA	NA	NA
104518	n-Butylbenzene	NA	NA	NA	6.53E+03	NA	NA	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	3.5E-03
99876	Isopropyltoluene, 4-	NA	NA	NA	7.31E+05	NA	NA	NA
135988	Butylbenzene, sec-	NA	NA	NA	1.10E+06	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+06	NA	NA	8.9E-03
75014	Vinyl chloride	NA	NA	NA	8.33E+05	NA	5.0E-06	1.6E-02
74839	Bromomethane	NA	NA	NA	3.89E+05	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	2.8E-05
75354	1,1-Dichloroethylene	NA	NA	NA	6.39E+05	NA	NA	2.5E-03
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67641	Acetone	NA	NA	NA	2.01E+06	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	6.78E+05	NA	NA	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75092	Methylene chloride	NA	NA	NA	2.96E+06	NA	5.6E-06	1.3E-04
156605	trans-1,2-Dichloroethylene	NA	NA	NA	2.12E+06	NA	NA	1.0E-03
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	3.8E-06
75343	1,1-Dichloroethane	NA	NA	NA	1.38E+06	NA	NA	8.0E-04
156592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA	NA	7.0E-04
78933	Butanone, 2- (MEK)	NA	NA	NA	4.63E+07	NA	NA	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	6.01E+05	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.88E+05	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	5.1E-07	6.1E-03
79016	Trichloroethylene	NA	NA	NA	6.05E+05	NA	1.1E-05	6.7E-03
108872	Methyl cyclohexane	NA	NA	NA	2.96E+04	NA	NA	2.8E-03
108883	Toluene	NA	NA	NA	3.02E+05	NA	NA	7.9E-04
127184	Tetrachloroethylene	NA	NA	NA	1.08E+05	NA	4.8E-07	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	1.3E-03
100414	Ethylbenzene	NA	NA	NA	1.58E+05	NA	NA	9.8E-05
1330207	Xylenes	NA	NA	NA	1.50E+05	NA	NA	NA
100425	Styrene	NA	NA	NA	5.44E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	1.06E+06	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.62E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.06E+05	NA	NA	2.1E-03
95501	1,2-Dichlorobenzene	NA	NA	NA	8.50E+05	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+06	NA	NA	NA
91576	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	9.8E-03
92524	Biphenyl, 1,1'-	NA	NA	NA	8.81E+04	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.84E+04	NA	NA	3.5E-04
83329	Acenaphthene	NA	NA	NA	6.09E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.85E+05	NA	NA	NA
86737	Fluorene	NA	NA	NA	2.97E+04	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	3.84E+04	NA	NA	5.1E-03
120127	Anthracene	NA	NA	NA	2.37E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.86E+07	NA	NA	4.7E+00
C9-C12	C9-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	8.3E-02
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.92E+06	NA	NA	9.6E-01
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.35E+07	NA	NA	1.9E+00
C11-C22	C11-C22 Aromatics	NA	NA	NA	6.82E+07	NA	NA	3.1E-01

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-05	8.1E+00

= Cancer risk > 1E-05 or HQ/HI>1E+00

Trimethylbenzene, 1,2,4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Dichloroethylene, 1,2- (total)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Trimethylbenzene, 1,3,5-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
n-Butylbenzene	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Naphthalene	
Isopropyltoluene, 4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Butylbenzene, sec-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Chloromethane	
Vinyl chloride	
Bromomethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Ethyl Chloride	
1,1-Dichloroethylene	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Acetone	
Carbon Disulfide	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methyl Acetate	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methylene chloride	
trans-1,2-Dichloroethylene	
Methyl-Tertiary-Butyl Ether	
1,1-Dichloroethane	
cis-1,2-Dichloroethylene	
Butanone, 2- (MEK)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
1,1,1-Trichloroethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Cyclohexane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Benzene	
Trichloroethylene	

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

SL-SCREEN
Version 2.3; 03/01

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES X

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration. ENTER Mean soil conc. C_R (µg/kg)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_1 (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm²)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm³)	ENTER Vadose zone soil total porosity, n^A (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^A (cm³/cm³)	ENTER Vadose zone soil organic carbon fraction, f_oc^A (unitless)	ENTER Averaging time for carcinogens, ATC (yrs)	ENTER Averaging time for noncarcinogens, ATNC (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (l/g-yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
95636	Trimethylbenzene, 1,2,4-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
540590	Dichloroethylene, 1,2- (total)		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
108678	Trimethylbenzene, 1,3,5-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
104518	n-Butylbenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
91203	Naphthalene	2.74E+03	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
99876	Isopropyltoluene, 4-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
135988	Butylbenzene, sec-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
74873	Chloromethane	2.49E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75014	Vinyl chloride	2.61E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
74839	Bromomethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75003	Ethyl Chloride	8.60E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75354	1,1-Dichloroethylene	8.34E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
67641	Acetone	3.24E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75150	Carbon Disulfide		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
79209	Methyl Acetate		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75092	Methylene chloride	7.27E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
156605	trans-1,2-Dichloroethylene	7.73E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
1634044	Methyl-Tertiary-Butyl Ether	8.73E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
75343	1,1-Dichloroethane	3.58E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
156592	cis-1,2-Dichloroethylene	1.80E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
78933	Butanone, 2- (MEK)		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
71556	1,1,1-Trichloroethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
110827	Cyclohexane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
71432	Benzene	8.08E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
79016	Trichloroethylene	2.91E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
108872	Methyl cyclohexane	4.45E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
108883	Toluene	3.85E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
127184	Tetrachloroethylene	1.47E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
108907	Chlorobenzene	3.11E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
100414	Ethylbenzene	1.84E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
1330207	Xylenes		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
100425	Styrene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
98828	Isopropylbenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
79345	1,1,2,2-Tetrachloroethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
541731	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
106467	1,4-Dichlorobenzene	2.50E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
95501	1,2-Dichlorobenzene	5.10E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
120821	1,2,4-Trichlorobenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
100527	Benzaldehyde		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
91576	Methylnaphthalene, 2-	5.41E+05	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
92524	Biphenyl, 1,1'-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
208968	Acenaphthylene	4.00E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
83329	Acenaphthene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
132649	Dibenzofuran	1.79E+03	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
86737	Fluorene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
85018	Phenanthrene	3.66E+04	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
120127	Anthracene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
C5-C8	C5-C8 Aliphatics	8.85E+04	15	15	10	LS	1		1.6	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
C9-C12	C9-C12 Aliphatics	6.11E+04	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
C9-C10	C9-C10 Aromatics	4.31E+05	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
C9-C18	C9-C18 Aliphatics	9.25E+05	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1
C11-C22	C11-C22 Aromatics	9.24E+05	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	9	9	219	8	6760	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	6.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	6.00E-02	6.00E-06	1.87E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluouroethane, 1,1,2-	2.68E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.65	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	1.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.86E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-08	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.60E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, Xcrack (cm)	Initial soil concentration used, GR (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,Ts}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)
95636	Trimethylbenzene, 1,2,4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	4.96E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.52E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	6.80E-03	2.93E-01	1.75E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.63E+03	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+06	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.52E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.46E-02	6.27E-01	1.75E-04	4.86E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.66E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.52E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.89E+06	2.52E+06	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.80E+01	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.66E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.34E+01	2.52E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.78E+05	2.52E+06	9.50E+06	1.30E-04	15	6.65E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	9.88E-05	4.25E-03	1.75E-04	8.61E-04
75092	Methylene chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	8.35E-04
156605	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+06	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+06	9.50E+06	1.30E-04	15	1.45E+03	5.16E-04	2.22E-02	1.75E-04	8.67E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.52E+06	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.83E+07	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	9.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.01E+05	2.52E+06	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.66E-01	1.75E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E+01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.08E+01	2.52E+06	9.50E+06	1.30E-04	15	8.12E+03	2.68E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.52E+06	9.50E+06	1.30E-04	15	8.66E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+06	9.50E+06	1.30E-04	15	9.15E+03	2.92E-03	1.26E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+06	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+06	9.50E+06	1.30E-04	15	8.80E+03	1.54E-03	6.65E-02	1.75E-04	4.56E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+06	9.50E+06	1.30E-04	15	1.02E+04	3.15E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.50E+05	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	5.86E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.08E-03	4.67E-02	1.75E-04	4.47E-04
98828	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.52E+06	9.50E+06	1.30E-04	15	1.64E+03	1.28E-02	5.51E-01	1.75E-04	3.96E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.18E+06	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.65E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.58E-04
106467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.60E+02	2.52E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.36E-04
95501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+06	9.50E+06	1.30E-04	15	1.21E+04	6.51E-07	2.37E-05	1.75E-04	3.84E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.26E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+06	9.50E+06	1.30E-04	15	1.63E+03	2.29E-05	9.84E-04	1.75E-04	1.35E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.41E+03	2.52E+06	9.50E+06	1.30E-04	15	1.61E+03	8.85E-04	3.81E-02	1.75E-04	3.13E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	2.65E-04	1.14E-02	1.75E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.61E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83329	Acenaphthene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+06	9.50E+06	1.30E-04	15	1.61E+04	3.67E-05	1.58E-03	1.75E-04	7.33E-04
132649	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	1.66E-04
86737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.97E+04	2.52E+06	9.50E+06	1.30E-04	15	1.52E+04	2.20E-06	9.46E-05	1.75E-04	8.16E-01
85018	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.52E+06	9.50E+06	1.30E-04	15	1.84E+04	1.28E-05	5.43E-04	1.75E-04	1.80E-03
C5-C8	C5-C8 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.83E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.84E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	7.80E-01	3.36E+01	1.75E-04	3.84E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.95E-03	1.70E-01	1.75E-04	3.69E-04
C9-C18	C9-C18 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.25E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	8.25E-01	3.55E+01	1.75E-04	3.84E-04
C11-C22	C11-C22 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.24E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.80E-04	1.65E-02	1.75E-04	4.27E-04

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	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(Pef) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+309	1.08E-05	N/A	N/A	6.0E-03
540590	Dichloroethylene, 1,2- (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-05	4.61E-02	N/A	3.0E-03
99876	Isopropyltoluene, 4-	1	15	3.16E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.86E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.88E-02	3.24E+06	0.10	2.74E+01	7.86E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.46E+06	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-05	8.99E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.88E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.88E-02	1.12E+05	0.10	2.74E+01	7.86E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	1.08E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+264	1.08E-05	1.17E+00	N/A	2.0E-01
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67641	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.09E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-05	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	15	6.64E-03	N/A	0.10	2.74E+01	8.51E-04	1.23E+03	1.17E+168	1.08E-05	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
156605	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.58E+03	0.10	2.74E+01	6.67E-04	1.23E+03	9.48E+216	1.08E-05	4.98E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.62E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
156592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.68E+04	0.10	2.74E+01	4.59E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.68E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+298	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	2.55E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+267	1.08E-05	3.08E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.93E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.35E+06	0.10	2.74E+01	5.95E-04	1.23E+03	1.60E+242	1.08E-05	3.62E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.92E-01	5.8E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.55E-04	1.23E+03	#NUM!	1.08E-05	3.46E-01	N/A	6.0E-02
100414	Ethylbenzene	1	15	7.26E-01	2.68E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.86E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.98E+255	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.56E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.94E+00	0.10	2.74E+01	3.94E-02	1.23E+09	4.74E+09	1.09E-05	4.28E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.59E+00	N/A	0.10	2.74E+01	2.26E-04	1.23E+09	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100527	Benzaldehyde	1	15	8.64E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+09	2.60E+107	1.08E-05	N/A	#N/A	#N/A
91576	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1'-	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+09	#NUM!	1.08E-05	N/A	N/A	N/A
208968	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.84E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.63E+01	1.64E+04	0.10	2.74E+01	1.66E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.16E-01	1.23E+09	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
85018	Phenanthrene	1	15	2.69E+01	6.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	6.76E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.60E-03	1.23E+09	5.16E+90	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+06	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.78E+06	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	7.29E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.55E+00	1.95E+07	0.10	2.74E+01	3.69E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.38E+03	2.42E+07	0.10	2.74E+01	3.64E-04	1.23E+09	#NUM!	1.08E-05	2.61E+02	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	1.40E+06	0.10	2.74E+01	4.27E-04	1.23E+09	#NUM!	1.08E-05	1.51E+01	N/A	5.0E-02

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Commercial Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.26E+05	NA	NA	NA
540590	Dichloroethylene, 1,2- (total)	NA	NA	NA	5.98E+02	NA	NA	NA
108678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA	NA	NA
104518	n-Butylbenzene	NA	NA	NA	6.63E+03	NA	NA	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	3.1E-03
99876	Isopropyltoluene, 4-	NA	NA	NA	7.31E+05	NA	NA	NA
135988	Butylbenzene, sec-	NA	NA	NA	1.10E+06	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+06	NA	NA	7.8E-03
75014	Vinyl chloride	NA	NA	NA	8.23E+05	NA	1.6E-06	1.4E-02
74839	Bromomethane	NA	NA	NA	3.69E+06	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	2.4E-05
75354	1,1-Dichloroethylene	NA	NA	NA	5.39E+05	NA	NA	1.2E-03
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67641	Acetone	NA	NA	NA	2.51E+08	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	8.78E+05	NA	NA	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75092	Methylene chloride	NA	NA	NA	2.98E+06	NA	2.1E-06	1.2E-04
156605	trans-1,2-Dichloroethylene	NA	NA	NA	2.12E+06	NA	NA	6.8E-04
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	3.3E-06
75343	1,1-Dichloroethane	NA	NA	NA	1.39E+06	NA	NA	7.0E-04
156592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA	NA	6.1E-04
78933	Butanone, 2- (MEK)	NA	NA	NA	4.63E+07	NA	NA	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	8.01E+05	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.88E+05	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	6.2E-06	2.1E-03
79016	Trichloroethylene	NA	NA	NA	6.05E+05	NA	3.3E-06	5.9E-03
108872	Methyl cyclohexane	NA	NA	NA	3.86E+04	NA	NA	2.4E-03
108883	Toluene	NA	NA	NA	3.02E+05	NA	NA	6.9E-04
127184	Tetrachloroethylene	NA	NA	NA	1.06E+05	NA	1.5E-07	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	1.2E-03
100414	Ethylbenzene	NA	NA	NA	1.56E+05	NA	NA	5.8E-05
1330207	Xylenes	NA	NA	NA	1.50E+05	NA	NA	NA
100425	Styrene	NA	NA	NA	5.44E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	1.06E+06	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.82E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.06E+05	NA	NA	1.6E-05
95501	1,2-Dichlorobenzene	NA	NA	NA	5.50E+05	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+06	NA	NA	NA
91576	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	8.6E-03
92524	Biphenyl, 1,1'-	NA	NA	NA	8.81E+04	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.94E+04	NA	NA	3.1E-04
83329	Acenaphthene	NA	NA	NA	6.09E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.63E+05	NA	NA	NA
86737	Fluorene	NA	NA	NA	3.97E+04	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	3.64E+04	NA	NA	4.5E-03
120127	Anthracene	NA	NA	NA	2.57E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.06E+07	NA	NA	4.1E+00
C9-C12	C9-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	7.3E-02
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.92E+06	NA	NA	6.4E-01
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.36E+07	NA	NA	2.6E-01
C11-C22	C11-C22 Aromatics	NA	NA	NA	3.92E+07	NA	NA	6.1E-02

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	5E-06	5.4E+00

= Cancer risk > 1E-05 or HQ/HI>1E+00

Trimethylbenzene, 1,2,4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Dichloroethylene, 1,2- (total)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Trimethylbenzene, 1,3,5-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
n-Butylbenzene	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Naphthalene	
Isopropyltoluene, 4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Butylbenzene, sec-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Chloromethane	
Vinyl chloride	
Bromomethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Ethyl Chloride	
1,1-Dichloroethylene	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Acetone	
Carbon Disulfide	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methyl Acetate	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methylene chloride	
trans-1,2-Dichloroethylene	
Methyl-Tertiary-Butyl Ether	
1,1-Dichloroethane	
cis-1,2-Dichloroethylene	
Butanone, 2- (MEK)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
1,1,1-Trichloroethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Cyclohexane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Benzene	
Trichloroethylene	

Appendix C 4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

SL-SCREEN Version 2.3; 03/01

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration. ENTER Mean soil conc., CR (ug/kg)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, Lt (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)	ENTER Averaging time for carcinogens, ATC (yrs)	ENTER Averaging time for noncarcinogens, ATNC (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time, ET (hrs/day)	ENTER Conversion factor, CF (hrs/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
95636	Trimethylbenzene, 1,2,4-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
540590	Dichloroethylene, 1,2- (total)		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
108678	Trimethylbenzene, 1,3,5-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
104518	n-Butylbenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
91203	Naphthalene	2.74E+03	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
99876	Isopropyltoluene, 4-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
135988	Butylbenzene, sec-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
74873	Chloromethane	2.49E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75014	Vinyl chloride	2.61E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
74839	Bromomethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75003	Ethyl Chloride	6.60E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75354	1,1-Dichloroethylene	1.20E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
67641	Acetone	3.24E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75150	Carbon Disulfide		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
79209	Methyl Acetate		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75092	Methylene chloride	7.27E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
156605	trans-1,2-Dichloroethylene	7.73E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
1634044	Methyl-Tertiary-Butyl Ether	6.75E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
75343	1,1-Dichloroethane	3.56E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
156592	cis-1,2-Dichloroethylene	1.80E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
78933	Butanone, 2- (MEK)		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
71556	1,1,1-Trichloroethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
110827	Cyclohexane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
71432	Benzene	2.10E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
79016	Trichloroethylene	2.81E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
108872	Methyl cyclohexane	4.45E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
108883	Toluene	6.85E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
127184	Tetrachloroethylene	1.47E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
108907	Chlorobenzene	3.11E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
100414	Ethylbenzene	1.84E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
1330207	Xylenes		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
100425	Styrene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
98828	Isopropylbenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
79345	1,1,2,2-Tetrachloroethane		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
541731	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
106467	1,4-Dichlorobenzene	2.50E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
95501	1,2-Dichlorobenzene	6.10E+01	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
120821	1,2,4-Trichlorobenzene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
100527	Benzaldehyde		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
91576	Methylnaphthalene, 2-	5.41E+03	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
92524	Biphenyl, 1,1'-		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
208968	Acenaphthylene	4.00E+02	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
83329	Acenaphthene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
132649	Dibenzofuran	1.79E+03	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
86737	Fluorene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
85018	Phenanthrene	3.66E+04	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
120127	Anthracene		15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
C5-C8	C5-C8 Aliphatics	9.83E+04	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
C9-C12	C9-C12 Aliphatics	6.11E+04	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
C9-C10	C9-C10 Aromatics	4.31E+06	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
C9-C18	C9-C18 Aliphatics	6.04E+06	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1
C11-C22	C11-C22 Aromatics	4.10E+06	15	15	10	LS	1		1.5	0.43	0.3	0.002	70	6	6	78	2.5	8760	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.68E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-06	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.80E+03	N/A	5.0E-02	S

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, Xcrack (cm)	Initial soil concentration used, CR (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)
95636	Trimethylbenzene, 1,2,4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	4.96E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.52E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	6.80E-03	2.93E-01	1.75E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.83E+03	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+06	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.52E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.48E-02	6.27E-01	1.76E-04	4.86E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.86E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.52E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.69E+06	2.52E+06	9.50E+06	1.30E-04	15	5.39E+03	3.94E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.60E+01	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.86E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.20E+02	2.52E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.52E+06	9.50E+06	1.30E-04	15	6.86E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	9.88E-05	4.25E-03	1.75E-04	8.81E-04
75092	Methylene chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	8.35E-04
156605	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+06	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+06	9.50E+06	1.30E-04	15	1.45E+03	5.16E-04	2.22E-02	1.75E-04	8.67E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.52E+06	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.83E+07	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	4.80E-05	2.11E-03	1.75E-04	9.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.01E+05	2.52E+06	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.66E-01	1.75E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.75E+00	7.54E+01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.10E+02	2.52E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.81E+02	2.52E+06	9.50E+06	1.30E-04	15	8.56E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+06	9.50E+06	1.30E-04	15	9.15E+03	2.92E-03	1.26E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+06	9.50E+06	1.30E-04	15	9.56E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+06	9.50E+06	1.30E-04	15	9.80E+03	1.54E-03	9.65E-02	1.76E-04	4.55E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+06	9.50E+06	1.30E-04	15	1.02E+04	3.16E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.50E+05	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	5.86E-08	2.52E-04	1.76E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+06	9.50E+06	1.30E-04	15	1.06E+04	1.08E-03	4.67E-02	1.75E-04	4.47E-04
98828	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.08E+06	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.95E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.15E+06	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.65E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.56E-04
106467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.52E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.36E-04
95501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+06	9.50E+06	1.30E-04	15	1.21E+04	5.51E-07	2.37E-05	1.76E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.25E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	2.29E-05	9.84E-04	1.75E-04	1.35E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.41E+03	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	6.86E-04	3.81E-02	1.75E-04	3.13E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.61E+04	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	2.66E-04	1.14E-02	1.75E-04	3.16E-04
208968	Acenaphthylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83329	Acenaphthene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+06	9.50E+06	1.30E-04	15	1.61E+04	3.67E-05	1.58E-03	1.75E-04	7.33E-04
132649	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	1.88E-04
86737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.97E+04	2.52E+06	9.50E+06	1.30E-04	15	1.62E+04	2.20E-06	9.48E-07	1.75E-04	8.16E-01
85018	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.52E+06	9.50E+06	1.30E-04	15	1.84E+04	1.26E-05	5.43E-04	1.75E-04	1.60E-03
C5-C8	C5-C8 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.83E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.84E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	7.90E-01	3.38E+01	1.75E-04	3.64E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.96E-03	1.70E-01	1.75E-04	3.89E-04
C9-C18	C9-C18 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.04E+06	2.52E+06	9.50E+06	1.30E-04	15	NA	8.28E-01	3.56E+01	1.75E-04	3.64E-04
C11-C22	C11-C22 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.10E+06	2.52E+06	9.50E+06	1.30E-04	15	NA	3.80E-04	1.55E-02	1.75E-04	4.27E-04

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	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(Pef) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+303	1.08E-05	N/A	N/A	6.0E-03
540590	Dichloroethylene, 1,2- (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-05	4.61E-02	N/A	3.0E-03
99876	Isopropyltoluene, 4-	1	15	3.16E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.66E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.66E-02	3.24E+05	0.10	2.74E+01	7.66E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+05	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-05	8.99E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.66E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.66E-02	1.12E+05	0.10	2.74E+01	7.68E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	2.04E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+264	1.08E-05	2.21E+00	N/A	2.0E-01
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67641	Acetone	1	15	1.15E-03	1.37E+09	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.09E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-06	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	15	6.64E-03	N/A	0.10	2.74E+01	6.61E-04	1.23E+03	1.17E+188	1.08E-05	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
156606	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.68E+03	0.10	2.74E+01	6.67E-04	1.23E+03	9.48E+216	1.08E-05	4.96E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.62E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
156592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.68E+04	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.68E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+268	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+267	1.08E-05	8.02E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.38E-01	3.35E+06	0.10	2.74E+01	5.98E-04	1.23E+03	1.50E+242	1.08E-05	3.62E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.38E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.92E-01	5.9E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.55E-04	1.23E+03	#NUM!	1.08E-05	3.48E-01	N/A	5.0E-02
100414	Ethylbenzene	1	15	7.26E-01	2.68E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+35	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.67E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.08E+258	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.66E+03	0.10	2.74E+01	4.38E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.84E+00	0.10	2.74E+01	3.84E-02	1.23E+03	4.74E+03	1.09E-05	4.28E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.56E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100527	Benzaldehyde	1	15	6.64E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.60E+107	1.08E-05	N/A	#N/A	#N/A
91576	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1'-	1	15	1.23E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208968	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.36E-04	1.23E+03	#NUM!	1.08E-05	4.64E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.83E+01	1.64E+04	0.10	2.74E+01	1.66E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.18E-01	1.23E+03	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
85018	Phenanthrene	1	15	2.63E+01	6.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	6.76E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.60E-03	1.23E+03	5.14E+80	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+08	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.76E+06	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	7.28E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.56E+00	1.95E+07	0.10	2.74E+01	3.69E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.36E+03	1.56E+08	0.10	2.74E+01	3.64E-04	1.23E+03	#NUM!	1.08E-05	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	6.23E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	6.72E+01	N/A	5.0E-02

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.38E+05	NA	NA	NA
540590	Dichloroethylene, 1,2- (total)	NA	NA	NA	6.96E+02	NA	NA	NA
108678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA	NA	NA
104518	n-Butylbenzene	NA	NA	NA	6.53E+03	NA	NA	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	3.4E-04
99876	Isopropyltoluene, 4-	NA	NA	NA	7.11E+05	NA	NA	NA
135988	Butylbenzene, sec-	NA	NA	NA	1.10E+06	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+06	NA	NA	6.7E-04
75014	Vinyl chloride	NA	NA	NA	8.33E+05	NA	1.2E-07	1.6E-03
74839	Bromomethane	NA	NA	NA	3.89E+06	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	2.7E-06
75354	1,1-Dichloroethylene	NA	NA	NA	6.39E+05	NA	NA	2.6E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67641	Acetone	NA	NA	NA	2.01E+08	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	8.78E+05	NA	NA	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75092	Methylene chloride	NA	NA	NA	2.95E+06	NA	1.8E-09	1.3E-05
156605	trans-1,2-Dichloroethylene	NA	NA	NA	2.12E+06	NA	NA	9.8E-05
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	3.7E-07
75343	1,1-Dichloroethane	NA	NA	NA	1.39E+06	NA	NA	7.8E-05
156592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA	NA	6.6E-05
78933	Butanone, 2- (MEK)	NA	NA	NA	4.63E+07	NA	NA	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	6.01E+05	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.88E+05	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	1.2E-08	5.9E-04
79016	Trichloroethylene	NA	NA	NA	6.05E+05	NA	2.5E-07	6.6E-04
108872	Methyl cyclohexane	NA	NA	NA	2.96E+04	NA	NA	2.7E-04
108883	Toluene	NA	NA	NA	3.02E+05	NA	NA	7.7E-05
127184	Tetrachloroethylene	NA	NA	NA	1.06E+05	NA	1.1E-08	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	1.3E-04
100414	Ethylbenzene	NA	NA	NA	1.56E+05	NA	NA	6.5E-06
1330207	Xylenes	NA	NA	NA	1.50E+05	NA	NA	NA
100425	Styrene	NA	NA	NA	6.44E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	1.06E+06	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.82E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.06E+05	NA	NA	2.0E-06
95501	1,2-Dichlorobenzene	NA	NA	NA	8.50E+05	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+06	NA	NA	NA
91576	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	9.6E-04
92524	Biphenyl, 1,1'-	NA	NA	NA	5.81E+04	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.84E+04	NA	NA	3.4E-05
83329	Acenaphthene	NA	NA	NA	5.09E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.85E+05	NA	NA	NA
86737	Fluorene	NA	NA	NA	2.97E+04	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	3.64E+04	NA	NA	5.0E-04
120127	Anthracene	NA	NA	NA	2.57E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.86E+07	NA	NA	4.6E-01
C9-C12	C9-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	8.1E-03
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.92E+06	NA	NA	9.3E-02
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.36E+07	NA	NA	1.9E-01
C11-C22	C11-C22 Aromatics	NA	NA	NA	6.92E+07	NA	NA	3.0E-02

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	4E-07	7.9E-01

= Cancer risk > 1E-05 or HQ/HI>1E+00

Trimethylbenzene, 1,2,4-	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Dichloroethylene, 1,2- (total)	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Trimethylbenzene, 1,3,5-	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
n-Butylbenzene	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Naphthalene	
Isopropyltoluene, 4-	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Butylbenzene, sec-	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Chloromethane	
Vinyl chloride	
Bromomethane	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Ethyl Chloride	
1,1-Dichloroethylene	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Acetone	
Carbon Disulfide	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Methyl Acetate	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Methylene chloride	
trans-1,2-Dichloroethylene	
Methyl-Tertiary-Butyl Ether	
1,1-Dichloroethane	
cis-1,2-Dichloroethylene	
Butanone, 2- (MEK)	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
1,1,1-Trichloroethane	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Cyclohexane	MESSAGE: Soil conc. >= saturation (Csat), Risk/HQ calculated at Csat.
Benzene	
Trichloroethylene	

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box) — SL-SCREEN Version 2.3, 03/01

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration. ENTER Mean soil conc., C_R (µg/kg)	ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_1 (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm²)	ENTER Vadose zone soil dry bulk density, ρ_b^d (g/cm³)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm³/cm³)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^v (unitless)	ENTER Averaging time for carcinogens, ATC (yrs)	ENTER Averaging time for noncarcinogens, ATNC (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time, ET (hrs/day)	ENTER Conversion factor, CF (mg/g)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
95636	Trimethylbenzene, 1,2,4-		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
540590	Dichloroethylene, 1,2- (total)		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
108678	Trimethylbenzene, 1,3,5-		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
104518	n-Butylbenzene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
91203	Naphthalene	2.74E+03	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
99876	Isopropyltoluene, 4-		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
135988	Butylbenzene, sec-		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
74873	Chloromethane	2.49E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75014	Vinyl chloride	2.61E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
74839	Bromomethane		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75003	Ethyl Chloride	8.60E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75354	1,1-Dichloroethylene	6.34E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2,		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
67641	Acetone	3.24E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75150	Carbon Disulfide		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
79209	Methyl Acetate		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75092	Methylene chloride	7.27E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
156605	trans-1,2-Dichloroethylene	7.73E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
1634044	Methyl-Tertiary-Butyl Ether	6.75E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
75343	1,1-Dichloroethane	3.58E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
156592	cis-1,2-Dichloroethylene	1.80E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
78933	Butanone, 2- (MEK)		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
71556	1,1,1-Trichloroethane		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
110827	Cyclohexane		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
71432	Benzene	8.08E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
79016	Trichloroethylene	2.81E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
108872	Methyl cyclohexane	4.45E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
108883	Toluene	3.86E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
127184	Tetrachloroethylene	1.47E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
108907	Chlorobenzene	3.11E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
100414	Ethylbenzene	1.84E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
1330207	Xylenes		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
100425	Styrene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
98828	Isopropylbenzene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
79345	1,1,2,2-Tetrachloroethane		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
541731	Dichlorobenzene, 1,3-	1.09E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
106467	1,4-Dichlorobenzene	2.80E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
95501	1,2-Dichlorobenzene	5.10E+01	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
120821	1,2,4-Trichlorobenzene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
100527	Benzaldehyde		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
91576	Methylnaphthalene, 2-	5.41E+03	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
92524	Biphenyl, 1,1'-		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
208968	Acenaphthylene	4.00E+02	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
83329	Acenaphthene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
132649	Dibenzofuran	1.79E+03	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
86737	Fluorene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
85018	Phenanthrene	3.86E+04	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
120127	Anthracene		15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
C5-C8	C5-C8 Aliphatics	9.63E+04	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
C9-C12	C9-C12 Aliphatics	5.11E+04	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
C9-C10	C9-C10 Aromatics	4.31E+06	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
C9-C18	C9-C18 Aliphatics	9.25E+06	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1
C11-C22	C11-C22 Aromatics	9.24E+06	15	15	10	LS		1		1.5	0.43	0.3	0.002	70	2	2	25	2.5	8760	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings (U.S. EPA June 18, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-triflouroethane, 1,1,2-	2.68E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.88E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+03	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.86E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-06	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.60E+03	N/A	5.0E-02	S

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_e (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, Xcrack (cm)	Initial soil concentration used, CR (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)
95636	Trimethylbenzene, 1,2,4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	4.96E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.52E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	6.60E-03	2.93E-01	1.75E-04	3.96E-04
104518	n-Butylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.63E+03	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.89E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+06	9.50E+06	1.30E-04	15	1.28E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.52E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.46E-02	6.27E-01	1.75E-04	4.88E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.66E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.52E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.46E-01	1.75E-04	6.44E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.69E+06	2.52E+06	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.60E+01	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.66E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.34E+01	2.52E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.52E+06	9.50E+06	1.30E-04	15	6.68E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	9.86E-05	4.25E-03	1.75E-04	8.61E-04
75092	Methylene chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	6.35E-04
156605	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+06	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+06	9.50E+06	1.30E-04	15	1.45E+03	5.16E-04	2.22E-02	1.75E-04	6.67E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.52E+06	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.83E+07	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	9.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.01E+05	2.52E+06	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.66E-01	1.75E-04	4.76E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E+01	1.75E-04	4.85E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.08E+01	2.52E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.52E+06	9.50E+06	1.30E-04	15	8.56E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+06	9.50E+06	1.30E-04	15	9.16E+03	2.82E-03	1.20E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+06	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+06	9.50E+06	1.30E-04	15	9.80E+03	1.54E-03	6.65E-02	1.75E-04	4.56E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+06	9.50E+06	1.30E-04	15	1.02E+04	3.18E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.60E+06	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	5.88E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+06	9.50E+06	1.30E-04	15	1.06E+04	1.08E-03	4.67E-02	1.75E-04	4.47E-04
98828	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.99E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.15E+06	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.66E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.56E-04
106467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.52E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.38E-04
95501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+06	9.50E+06	1.30E-04	15	1.21E+04	5.51E-07	2.37E-05	1.75E-04	3.84E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.26E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	2.29E-05	9.84E-04	1.75E-04	1.35E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.41E+03	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	8.86E-04	3.81E-02	1.75E-04	3.13E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.81E+04	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	2.66E-04	1.14E-02	1.75E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	2.45E-04	1.05E-02	1.75E-04	3.38E-04
83329	Acenaphthene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+06	9.50E+06	1.30E-04	15	1.61E+04	3.67E-05	1.58E-03	1.75E-04	7.33E-04
132649	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	3.61E-03	1.51E-01	1.75E-04	1.66E-04
86737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.87E+04	2.52E+06	9.50E+06	1.30E-04	15	1.62E+04	2.20E-06	9.48E-07	1.75E-04	8.18E-01
85018	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.80E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.52E+06	9.50E+06	1.30E-04	15	1.84E+04	1.26E-05	5.43E-04	1.75E-04	1.60E-03
C5-C8	C5-C8 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.83E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	6.48E-01	2.79E+01	1.75E-04	3.64E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	7.80E-01	3.36E+01	1.75E-04	3.64E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.96E-03	1.70E-01	1.75E-04	3.69E-04
C9-C16	C9-C16 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.25E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	8.28E-01	3.56E+01	1.75E-04	3.64E-04
C11-C22	C11-C22 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.24E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.69E-04	1.56E-02	1.75E-04	4.27E-04

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_s (cm^3/g)	Source vapor conc., C_{source} (ug/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(Pef) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (ug/m^3)	Unit risk factor, URF $(ug/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+309	1.08E-05	N/A	N/A	6.0E-03
540590	Dichloroethylene, 1,2- (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.96E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-05	4.61E-02	N/A	3.0E-03
99876	Isopropyltoluene, 4-	1	15	3.18E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.86E-04	1.23E+03	5.47E+297	1.08E-05	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.86E-02	3.24E+06	0.10	2.74E+01	7.65E-04	1.23E+03	1.14E+189	1.08E-05	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+05	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-05	6.89E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.86E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.86E-02	1.12E+06	0.10	2.74E+01	7.65E-04	1.23E+03	1.14E+189	1.08E-05	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	1.08E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+264	1.08E-05	1.17E+00	N/A	2.0E-01
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.75E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67641	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.09E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-05	N/A	N/A	7.0E-01
79209	Methyl Acetate	1	15	6.84E-03	N/A	0.10	2.74E+01	8.81E-04	1.23E+03	1.17E+168	1.08E-05	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-05	1.73E+00	4.7E-07	3.0E+00
156605	trans-1,2-Dichloroethylene	1	15	1.05E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.58E+03	0.10	2.74E+01	6.87E-04	1.23E+03	9.48E+216	1.08E-05	4.99E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.62E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
156592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.86E+04	0.10	2.74E+01	4.69E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.66E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+296	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	2.65E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+267	1.08E-05	3.08E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+299	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.35E+06	0.10	2.74E+01	5.98E-04	1.23E+03	1.50E+242	1.08E-05	3.82E+01	N/A	3.0E+00
108883	Toluene	1	15	3.84E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.10E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	9.92E-01	5.9E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.65E-04	1.23E+03	#NUM!	1.08E-05	3.48E-01	N/A	5.0E-02
100414	Ethylbenzene	1	15	7.29E-01	2.88E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.55E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.95E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.67E-01	N/A	0.10	2.74E+01	5.65E-04	1.23E+03	1.98E+258	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.88E+03	0.10	2.74E+01	4.35E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.94E+00	0.10	2.74E+01	3.94E-02	1.23E+03	4.74E+03	1.09E-05	4.28E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.55E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100527	Benzaldehyde	1	15	6.54E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.60E+107	1.09E-05	N/A	#N/A	#N/A
91578	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1'-	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208968	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.64E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.83E+01	1.84E+04	0.10	2.74E+01	1.66E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	6.16E-01	1.23E+03	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
85018	Phenanthrene	1	15	2.83E+01	6.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	6.76E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+90	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+05	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.76E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.29E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.58E+00	1.95E+07	0.10	2.74E+01	3.68E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.36E+03	2.42E+07	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	2.61E+02	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	1.40E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	1.51E+01	N/A	5.0E-02

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Child Recreational Scenario - CT
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

INCREMENTAL RISK CALCULATIONS:

Chemical CAS No. (numbers only, no dashes)	Chemical	Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.36E+05	NA	NA	NA
540590	Dichloroethylene, 1,2- (total)	NA	NA	NA	5.99E+02	NA	NA	NA
108678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA	NA	NA
104518	n-Butylbenzene	NA	NA	NA	6.63E+03	NA	NA	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	1.1E-04
99876	Isopropyltoluene, 4-	NA	NA	NA	7.31E+03	NA	NA	NA
135988	Butylbenzene, sec-	NA	NA	NA	1.10E+04	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+06	NA	NA	2.9E-04
75014	Vinyl chloride	NA	NA	NA	8.33E+05	NA	1.3E-06	5.2E-04
74839	Bromomethane	NA	NA	NA	3.69E+06	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	9.0E-07
75354	1,1-Dichloroethylene	NA	NA	NA	8.39E+05	NA	NA	4.3E-05
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67641	Acetone	NA	NA	NA	2.01E+06	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	8.76E+05	NA	NA	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75092	Methylene chloride	NA	NA	NA	2.98E+06	NA	1.7E-10	4.3E-06
156605	trans-1,2-Dichloroethylene	NA	NA	NA	2.12E+06	NA	NA	3.1E-06
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	1.2E-07
75343	1,1-Dichloroethane	NA	NA	NA	1.39E+06	NA	NA	2.6E-05
156592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA	NA	2.3E-05
78933	Butanone, 2- (MEK)	NA	NA	NA	4.83E+07	NA	NA	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	8.01E+05	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.88E+05	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	5.1E-10	7.8E-05
79016	Trichloroethylene	NA	NA	NA	6.05E+05	NA	2.7E-08	2.2E-04
108872	Methyl cyclohexane	NA	NA	NA	2.98E+04	NA	NA	9.0E-05
108883	Toluene	NA	NA	NA	3.02E+05	NA	NA	2.6E-05
127184	Tetrachloroethylene	NA	NA	NA	1.06E+05	NA	1.2E-09	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	4.3E-05
100414	Ethylbenzene	NA	NA	NA	1.56E+05	NA	NA	2.2E-06
1330207	Xylenes	NA	NA	NA	1.50E+05	NA	NA	NA
100425	Styrene	NA	NA	NA	3.44E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	1.06E+06	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+05	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.62E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.05E+05	NA	NA	6.7E-07
95501	1,2-Dichlorobenzene	NA	NA	NA	8.50E+06	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+06	NA	NA	NA
91576	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	3.2E-04
92524	Biphenyl, 1,1-	NA	NA	NA	5.81E+04	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.54E+04	NA	NA	1.1E-05
83329	Acenaphthene	NA	NA	NA	5.09E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.65E+05	NA	NA	NA
86737	Fluorene	NA	NA	NA	2.97E+04	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	3.64E+04	NA	NA	1.7E-04
120127	Anthracene	NA	NA	NA	2.57E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.35E+07	NA	NA	1.5E-01
C9-C12	C9-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	2.7E-03
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.82E+06	NA	NA	3.1E-03
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.36E+07	NA	NA	9.7E-03
C11-C22	C11-C22 Aromatics	NA	NA	NA	5.82E+07	NA	NA	2.2E-03

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	4E-08	2.0E-01

= Cancer risk > 1E-05 or HQ/HI>1E+00

Trimethylbenzene, 1,2,4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Dichloroethylene, 1,2- (total)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Trimethylbenzene, 1,3,5-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
n-Butylbenzene	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Naphthalene	
Isopropyltoluene, 4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Butylbenzene, sec-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Chloromethane	
Vinyl chloride	
Bromomethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Ethyl Chloride	
1,1-Dichloroethylene	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Acetone	
Carbon Disulfide	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methyl Acetate	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methylene chloride	
trans-1,2-Dichloroethylene	
Methyl-Tertiary-Butyl Ether	
1,1-Dichloroethane	
cis-1,2-Dichloroethylene	
Butanone, 2- (MEK)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
1,1,1-Trichloroethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Cyclohexane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Benzene	
Trichloroethylene	

Attachment C-6
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Adult Recreational Scenario - RME
Southwest Properties, Wells GAH Superfund Site, Operable Unit 2
Whitney Barrel

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

SL-SCREEN
Version 2.3; 03/01

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES X

ENTER Chemical CAS No. (numbers only, no dashes)	Chemical	Enter initial soil concentration. ENTER Mean soil conc. OR (ug/kg)	ENTER Depth below grade to bottom of enclosed space floor, L_B (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_1 (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type used to estimate soil vapor permeability	OR	Note	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^A (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^A (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^A (unitless)	ENTER Averaging time for carcinogens, ATC (yrs)	ENTER Averaging time for noncarcinogens, ATNC (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Exposure time ET (hrs/day)	ENTER Conversion factor CF (hr/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
95636	Trimethylbenzene, 1,2,4-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
540866	Dichloroethylene, 1,2- (total)		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
108678	Trimethylbenzene, 1,3,5-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
104518	n-Butylbenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
91203	Naphthalene	2.74E+03	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
99876	Isopropyltoluene, 4-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
135988	Butylbenzene, sec-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
74873	Chloromethane	2.49E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75014	Vinyl chloride	2.81E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
74839	Bromomethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75003	Ethyl Chloride	5.80E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75354	1,1-Dichloroethylene	1.20E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
67641	Acetone	3.24E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75150	Carbon Disulfide		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
79209	Methyl Acetate		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75092	Methylene chloride	7.27E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
156605	trans-1,2-Dichloroethylene	7.73E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
1634044	Methyl-Tertiary-Butyl Ether	5.75E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
75343	1,1-Dichloroethane	3.56E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
156592	cis-1,2-Dichloroethylene	1.90E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
78933	Butanone, 2- (MEK)		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
71556	1,1,1-Trichloroethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
110827	Cyclohexane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
71432	Benzene	2.10E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
79016	Trichloroethylene	2.91E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
108872	Methyl cyclohexane	4.45E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
108883	Toluene	5.85E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
127184	Tetrachloroethylene	1.47E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
108907	Chlorobenzene	3.11E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
100414	Ethylbenzene	1.84E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
1330207	Xylenes		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
100425	Styrene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
98828	Isopropylbenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
79345	1,1,2,2-Tetrachloroethane		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
541731	Dichlorobenzene, 1,3-	1.00E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
106467	1,4-Dichlorobenzene	2.50E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
95501	1,2-Dichlorobenzene	5.10E+01	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
120821	1,2,4-Trichlorobenzene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
100527	Benzaldehyde		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
91576	Methylnaphthalene, 2-	5.41E+05	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
92524	Biphenyl, 1,1'-		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
208968	Acenaphthylene	4.00E+02	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
83329	Acenaphthene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
132649	Dibenzofuran	1.72E+03	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
86737	Fluorene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
85018	Phenanthrene	3.56E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
120127	Anthracene		15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
C5-C8	C5-C8 Aliphatics	9.83E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
C9-C12	C9-C12 Aliphatics	5.11E+04	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
C9-C10	C9-C10 Aromatics	4.31E+05	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
C13-C18	C9-C18 Aliphatics	5.04E+06	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1
C11-C22	C11-C22 Aromatics	4.10E+06	15	15	10	LS	1			1.5	0.43	0.3	0.002	70	24	24	78	2.5	8760	1.0E-06	1

Note:
1) Default soil parameters from table 7 of User's Guide for Evaluating Subsurface Vapor Intrusion into Building (U.S. EPA June 19, 2003) were used for soil water filled porosity (θ_w), soil organic carbon fraction (f_{oc}), soil total porosity (n), and soil dry bulk density (ρ_b).

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Adult Recreational Scenario - RME
Southwest Prperties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
95636	Trimethylbenzene, 1,2,4-	7.80E-02	9.03E-06	5.70E-03	25	1.25E+03	442.30	649.11	3.72E+03	5.70E+01	N/A	6.0E-03	L
540590	Dichloroethylene, 1,2- (total)	5.59E-02	6.47E-06	4.30E-04	20	1.32E+03	585.00	877.50	1.28E+02	1.30E+00	#N/A	#N/A	0.0E+00
108678	Trimethylbenzene, 1,3,5-	6.48E-02	7.86E-06	7.81E-03	25	1.25E+03	442.30	649.11	1.67E+03	2.00E+01	N/A	6.0E-03	L
104518	n-Butylbenzene	7.25E-02	8.39E-06	1.25E-02	25	1.23E+03	456.00	684.00	2.51E+03	1.26E+00	#N/A	#N/A	L
91203	Naphthalene	5.90E-02	7.50E-06	4.83E-04	25	1.04E+04	491.14	748.40	2.00E+03	3.10E+01	N/A	3.0E-03	S
99876	Isopropyltoluene, 4-	7.25E-02	8.39E-06	8.60E+00	25	1.24E+03	450.10	652.04	1.58E+03	2.34E+01	N/A	4.0E-01	L
135988	Butylbenzene, sec-	8.00E-02	8.00E-06	1.67E-02	25	1.24E+03	446.65	669.98	3.11E+04	1.76E+01	#N/A	#N/A	0.0E+00
74873	Chloromethane	1.26E-01	6.50E-06	8.67E-03	25	1.35E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	9.0E-02	0.0E+00
75014	Vinyl chloride	1.06E-01	1.23E-05	2.71E-02	25	5.25E+03	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01	L
74839	Bromomethane	7.28E-02	1.21E-05	6.22E-03	25	5.49E+03	276.50	414.75	1.43E+01	1.52E+04	N/A	5.0E-03	0.0E+00
75003	Ethyl Chloride	1.26E-01	6.50E-06	8.67E-03	25	1.36E+03	249.00	373.50	1.43E+01	5.32E+03	N/A	1.0E+01	L
75354	1,1-Dichloroethylene	9.00E-02	1.04E-05	2.61E-02	25	6.25E+03	304.75	576.05	5.89E+01	2.25E+03	N/A	2.0E-01	L
76131	Trichloro-1,2,2-triflouroethane, 1,1,2-	2.88E-02	8.07E-06	5.17E-01	25	1.33E+03	320.70	481.05	2.25E+02	1.70E+02	N/A	3.0E+01	0.0E+00
67641	Acetone	1.24E-01	1.14E-05	3.88E-05	25	6.96E+03	329.20	508.10	5.75E-01	1.00E+06	N/A	N/A	L
75150	Carbon Disulfide	1.04E-01	1.29E-05	1.27E-02	25	6.39E+03	319.00	552.00	5.14E+01	2.67E+03	N/A	7.0E-01	L
79209	Methyl Acetate	1.04E-01	1.00E-05	1.13E-04	25	1.31E+03	365.00	547.50	3.32E+00	2.43E+05	#N/A	#N/A	0.0E+00
75092	Methylene chloride	1.01E-01	1.17E-05	2.19E-03	25	6.71E+03	313.00	510.00	1.17E+01	1.30E+04	4.7E-07	3.0E+00	L
156605	trans-1,2-Dichloroethylene	7.07E-02	1.19E-05	9.39E-03	25	1.33E+03	320.85	516.50	5.25E+01	6.30E+03	N/A	2.0E-01	L
1634044	Methyl-Tertiary-Butyl Ether	1.02E-01	1.05E-05	5.87E-04	25	1.32E+03	328.36	497.11	3.84E+01	5.10E+04	N/A	3.0E+00	L
75343	1,1-Dichloroethane	7.42E-02	1.05E-05	5.61E-03	25	6.90E+03	330.55	523.00	3.16E+01	5.06E+03	N/A	5.0E-01	L
156592	cis-1,2-Dichloroethylene	7.36E-02	1.13E-05	4.07E-03	25	7.19E+03	333.65	544.00	3.55E+01	3.50E+03	N/A	2.0E-01	L
78933	Butanone, 2- (MEK)	8.08E-02	9.80E-06	5.60E-05	25	1.31E+03	352.50	528.75	3.83E+00	2.23E+05	N/A	N/A	0.0E+00
71556	1,1,1-Trichloroethane	7.80E-02	8.80E-06	1.72E-02	25	7.14E+03	347.24	545.00	1.10E+02	1.33E+03	N/A	2.2E+00	L
110827	Cyclohexane	8.00E-02	9.00E-06	2.00E+00	25	1.31E+03	353.85	530.78	1.60E+02	5.50E+01	#N/A	#N/A	0.0E+00
71432	Benzene	8.80E-02	9.80E-06	5.56E-03	25	7.34E+03	353.24	562.16	5.89E+01	1.75E+03	7.8E-06	3.0E-02	L
79016	Trichloroethylene	7.90E-02	9.10E-06	1.03E-02	25	7.51E+03	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02	L
108872	Methyl cyclohexane	9.86E-02	8.52E-06	4.23E-01	25	1.30E+03	373.90	560.85	2.68E+02	1.40E+01	N/A	3.0E+00	L
108883	Toluene	8.70E-02	8.60E-06	6.63E-03	25	7.93E+03	383.78	591.79	1.82E+02	5.26E+02	N/A	4.0E-01	L
127184	Tetrachloroethylene	7.20E-02	8.20E-06	1.84E-02	25	8.29E+03	394.40	620.20	1.55E+02	2.00E+02	5.9E-06	N/A	L
108907	Chlorobenzene	7.30E-02	8.70E-06	3.71E-03	25	8.41E+03	404.87	632.40	2.19E+02	4.72E+02	N/A	6.0E-02	L
100414	Ethylbenzene	7.50E-02	7.80E-06	7.88E-03	25	8.50E+03	409.34	617.20	3.63E+02	1.69E+02	N/A	1.0E+00	L
1330207	Xylenes	7.69E-02	8.44E-06	6.73E-06	25	1.26E+03	417.40	616.21	2.41E+02	2.20E+02	N/A	1.0E-01	L
100425	Styrene	7.10E-02	8.00E-06	2.76E-03	25	8.74E+03	418.31	636.00	7.76E+02	3.10E+02	#N/A	#N/A	L
98828	Isopropylbenzene	6.50E-02	7.83E-06	1.47E-02	25	1.26E+03	425.40	631.01	9.31E+02	5.60E+01	N/A	4.0E-01	L
79345	1,1,2,2-Tetrachloroethane	7.10E-02	7.90E-06	3.44E-04	25	9.00E+03	419.60	661.15	9.33E+01	2.97E+03	#N/A	#N/A	L
541731	Dichlorobenzene, 1,3-	4.14E-02	8.85E-06	4.70E-03	25	1.24E+03	446.00	683.96	1.70E+02	6.88E+01	N/A	N/A	L
106467	1,4-Dichlorobenzene	6.90E-02	7.90E-06	2.43E-03	25	9.27E+03	447.21	684.75	6.17E+02	7.38E+01	N/A	8.0E-01	S
95501	1,2-Dichlorobenzene	6.88E-02	9.41E-06	1.62E-06	25	9.70E+03	465.00	697.50	5.34E+01	2.77E+04	N/A	N/A	S
120821	1,2,4-Trichlorobenzene	3.00E-02	8.23E-06	1.42E-03	25	1.05E+04	486.15	725.00	1.78E+03	3.00E+02	N/A	2.0E-01	L
100527	Benzaldehyde	7.30E-02	9.07E-06	2.62E-05	25	1.24E+03	452.00	678.00	3.27E+01	6.57E+03	#N/A	#N/A	0.0E+00
91576	Methylnaphthalene, 2-	4.84E-02	7.75E-06	1.01E-03	25	1.17E+03	514.05	761.01	8.51E+03	2.46E+01	N/A	3.0E-03	S
92524	Biphenyl, 1,1'-	4.04E-02	8.15E-06	3.03E-04	25	1.15E+03	529.10	793.65	6.25E+03	6.94E+00	N/A	N/A	0.0E+00
208968	Acenaphthylene	4.43E-02	7.44E-06	2.80E-04	25	1.12E+03	553.00	792.01	4.79E+03	3.93E+00	N/A	3.0E-03	S
83329	Acenaphthene	4.21E-02	7.69E-06	1.55E-04	25	1.22E+04	550.54	803.15	7.08E+03	4.24E+00	N/A	3.0E-03	S
132649	Dibenzofuran	2.67E-02	5.93E-06	4.00E-03	25	1.11E+03	559.00	824.01	8.13E+03	1.00E+01	N/A	N/A	S
86737	Fluorene	3.63E-02	7.88E-06	9.41E-06	25	1.27E+04	570.44	870.00	7.71E+03	1.90E+00	N/A	3.0E-03	S
85018	Phenanthrene	3.30E-02	7.47E-06	1.30E-04	25	1.06E+03	613.00	869.01	1.41E+04	1.28E+00	N/A	3.0E-03	S
120127	Anthracene	3.24E-02	7.74E-06	6.51E-05	25	1.31E+04	615.18	873.00	2.95E+04	4.34E-02	N/A	3.0E-03	S
C5-C8	C5-C8 Aliphatics	6.00E-02	1.00E-05	1.30E+00	25	NA	NA	NA	2.27E+03	1.10E+04	N/A	2.0E-01	S
C9-C12	C9-C12 Aliphatics	6.00E-02	1.00E-05	1.56E+00	25	NA	NA	NA	1.50E+05	7.00E+01	N/A	2.0E-01	S
C9-C10	C9-C10 Aromatics	6.00E-02	1.00E-05	7.92E-03	25	NA	NA	NA	1.78E+03	5.10E+04	N/A	5.0E-02	S
C9-C18	C9-C18 Aliphatics	6.00E-02	1.00E-05	1.66E+00	25	NA	NA	NA	6.80E+05	1.00E+01	N/A	2.0E-01	S
C11-C22	C11-C22 Aromatics	6.00E-02	1.00E-05	7.32E-04	25	NA	NA	NA	5.00E+03	5.90E+03	N/A	5.0E-02	S

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Adult Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Source-building separation, LT (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, Xcrack (cm)	Initial soil concentration used, CR (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. soil temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. soil temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. soil temperature, HTS (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)
95636	Trimethylbenzene, 1,2,4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.36E+05	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	4.96E-03	2.13E-01	1.75E-04	4.77E-04
540590	Dichloroethylene, 1,2- (total)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.96E+02	2.52E+06	9.50E+06	1.30E-04	15	1.73E+03	3.87E-04	1.67E-02	1.75E-04	3.77E-04
108678	Trimethylbenzene, 1,3,5-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.13E+04	2.52E+06	9.50E+06	1.30E-04	15	1.55E+03	6.80E-03	2.93E-01	1.75E-04	3.95E-04
104518	n-Butylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.63E+03	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.09E-02	4.69E-01	1.75E-04	4.41E-04
91203	Naphthalene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.74E+03	2.52E+06	9.50E+06	1.30E-04	15	1.29E+04	1.52E-04	6.55E-03	1.75E-04	4.70E-04
99876	Isopropyltoluene, 4-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.31E+05	2.52E+06	9.50E+06	1.30E-04	15	1.57E+03	7.48E+00	3.22E+02	1.75E-04	4.39E-04
135988	Butylbenzene, sec-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.10E+06	2.52E+06	9.50E+06	1.30E-04	15	1.53E+03	1.48E-02	6.27E-01	1.76E-04	4.66E-04
74873	Chloromethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.49E+02	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.79E-03	3.35E-01	1.75E-04	7.66E-04
75014	Vinyl chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.61E+02	2.52E+06	9.50E+06	1.30E-04	15	5.00E+03	1.73E-02	7.48E-01	1.75E-04	8.44E-04
74839	Bromomethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.69E+06	2.52E+06	9.50E+06	1.30E-04	15	5.39E+03	3.84E-03	1.65E-01	1.75E-04	4.48E-04
75003	Ethyl Chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.60E+01	2.52E+06	9.50E+06	1.30E-04	15	1.20E+03	7.78E-03	3.35E-01	1.75E-04	7.66E-04
75354	1,1-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.20E+02	2.52E+06	9.50E+06	1.30E-04	15	6.39E+03	1.47E-02	6.34E-01	1.75E-04	5.47E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.99E+05	2.52E+06	9.50E+06	1.30E-04	15	1.44E+03	4.55E-01	1.96E+01	1.75E-04	1.75E-04
67641	Acetone	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.24E+02	2.52E+06	9.50E+06	1.30E-04	15	7.56E+03	1.97E-05	8.50E-04	1.75E-04	2.07E-03
75150	Carbon Disulfide	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	8.78E+05	2.52E+06	9.50E+06	1.30E-04	15	6.68E+03	6.99E-03	3.01E-01	1.75E-04	6.34E-04
79209	Methyl Acetate	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.03E+07	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	9.88E-05	4.25E-03	1.75E-04	8.61E-04
75092	Methylene chloride	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.27E+02	2.52E+06	9.50E+06	1.30E-04	15	7.03E+03	1.17E-03	5.03E-02	1.75E-04	6.35E-04
156605	trans-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	7.73E+01	2.52E+06	9.50E+06	1.30E-04	15	1.42E+03	8.27E-03	3.56E-01	1.75E-04	4.32E-04
1634044	Methyl-Tertiary-Butyl Ether	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.75E+01	2.52E+06	9.50E+06	1.30E-04	15	1.45E+03	5.15E-04	2.22E-02	1.75E-04	6.87E-04
75343	1,1-Dichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.58E+02	2.52E+06	9.50E+06	1.30E-04	15	7.45E+03	2.88E-03	1.24E-01	1.75E-04	4.58E-04
156592	cis-1,2-Dichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.80E+02	2.52E+06	9.50E+06	1.30E-04	15	7.73E+03	2.04E-03	8.77E-02	1.75E-04	4.59E-04
78933	Butanone, 2- (MEK)	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.63E+07	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	4.90E-05	2.11E-03	1.75E-04	9.45E-04
71556	1,1,1-Trichloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.01E+06	2.52E+06	9.50E+06	1.30E-04	15	7.88E+03	8.50E-03	3.66E-01	1.75E-04	4.75E-04
110827	Cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.88E+05	2.52E+06	9.50E+06	1.30E-04	15	1.49E+03	1.75E+00	7.54E+01	1.75E-04	4.65E-04
71432	Benzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.10E+02	2.52E+06	9.50E+06	1.30E-04	15	8.12E+03	2.69E-03	1.16E-01	1.75E-04	5.42E-04
79016	Trichloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.91E+02	2.52E+06	9.50E+06	1.30E-04	15	8.58E+03	4.79E-03	2.06E-01	1.75E-04	4.83E-04
108872	Methyl cyclohexane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.45E+02	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	3.70E-01	1.59E+01	1.75E-04	5.98E-04
108883	Toluene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.85E+02	2.52E+06	9.50E+06	1.30E-04	15	9.15E+03	2.92E-03	1.26E-01	1.75E-04	5.34E-04
127184	Tetrachloroethylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.47E+02	2.52E+06	9.50E+06	1.30E-04	15	9.55E+03	7.83E-03	3.37E-01	1.75E-04	4.39E-04
108907	Chlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.11E+02	2.52E+06	9.50E+06	1.30E-04	15	9.80E+03	1.54E-03	6.65E-02	1.75E-04	4.55E-04
100414	Ethylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.84E+02	2.52E+06	9.50E+06	1.30E-04	15	1.02E+04	3.18E-03	1.37E-01	1.75E-04	4.60E-04
1330207	Xylenes	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.60E+05	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	5.98E-06	2.52E-04	1.75E-04	3.75E-03
100425	Styrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.44E+05	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.06E-03	4.67E-02	1.75E-04	4.47E-04
98828	Isopropylbenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.06E+06	2.52E+06	9.50E+06	1.30E-04	15	1.54E+03	1.28E-02	5.51E-01	1.75E-04	3.95E-04
79345	1,1,2,2-Tetrachloroethane	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.15E+06	2.52E+06	9.50E+06	1.30E-04	15	1.05E+04	1.34E-04	5.77E-03	1.75E-04	5.65E-04
541731	Dichlorobenzene, 1,3-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.50E+03	4.11E-03	1.77E-01	1.75E-04	2.58E-04
106467	1,4-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.50E+02	2.52E+06	9.50E+06	1.30E-04	15	1.12E+04	8.89E-04	3.83E-02	1.75E-04	4.38E-04
95501	1,2-Dichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	5.10E+01	2.52E+06	9.50E+06	1.30E-04	15	1.21E+04	5.51E-07	2.37E-05	1.75E-04	3.94E-02
120821	1,2,4-Trichlorobenzene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.13E+06	2.52E+06	9.50E+06	1.30E-04	15	1.32E+04	4.35E-04	1.87E-02	1.75E-04	2.25E-04
100527	Benzaldehyde	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.74E+06	2.52E+06	9.50E+06	1.30E-04	15	1.63E+03	2.29E-05	9.84E-04	1.75E-04	1.35E-03
91576	Methylnaphthalene, 2-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.41E+03	2.52E+06	9.50E+06	1.30E-04	15	1.51E+03	8.86E-04	3.81E-02	1.75E-04	3.13E-04
92524	Biphenyl, 1,1'-	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.81E+04	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	2.66E-04	1.14E-02	1.75E-04	3.15E-04
208968	Acenaphthylene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.00E+02	2.52E+06	9.50E+06	1.30E-04	15	1.61E+03	2.45E-04	1.05E-02	1.75E-04	3.36E-04
83329	Acenaphthene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.09E+04	2.52E+06	9.50E+06	1.30E-04	15	1.61E+04	3.67E-06	1.58E-03	1.75E-04	7.33E-04
132649	Dibenzofuran	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	1.79E+03	2.52E+06	9.50E+06	1.30E-04	15	1.47E+03	3.51E-03	1.51E-01	1.75E-04	4.66E-04
86737	Fluorene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.87E+04	2.52E+06	9.50E+06	1.30E-04	15	1.62E+04	2.20E-08	9.48E-07	1.75E-04	5.16E-01
85018	Phenanthrene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	3.64E+04	2.52E+06	9.50E+06	1.30E-04	15	1.48E+03	1.14E-04	4.90E-03	1.75E-04	3.50E-04
120127	Anthracene	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	2.57E+03	2.52E+06	9.50E+06	1.30E-04	15	1.84E+04	1.26E-06	5.43E-04	1.75E-04	1.60E-03
C5-C8	C5-C8 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	9.83E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	8.49E-01	2.79E+01	1.75E-04	3.64E-04
C9-C12	C9-C12 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.11E+04	2.52E+06	9.50E+06	1.30E-04	15	NA	7.60E-01	3.98E+01	1.75E-04	3.64E-04
C9-C10	C9-C10 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.31E+05	2.52E+06	9.50E+06	1.30E-04	15	NA	3.98E-03	1.70E-01	1.75E-04	3.69E-04
C9-C16	C9-C16 Aliphatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	6.04E+06	2.52E+06	9.50E+06	1.30E-04	15	NA	8.28E-01	3.56E+01	1.75E-04	3.64E-04
C11-C22	C11-C22 Aromatics	1	0.130	0.659	1.62E-08	0.390	6.33E-09	1.72E+04	4.10E+06	2.52E+06	9.50E+06	1.30E-04	15	NA	3.60E-04	1.55E-02	1.75E-04	4.27E-04

Appendix C.4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Adult Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	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(Pef) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
95636	Trimethylbenzene, 1,2,4-	1	15	7.43E+00	N/A	0.10	2.74E+01	4.77E-04	1.23E+03	2.75E+303	1.08E-06	N/A	N/A	6.0E-03
540590	Dichloroethylene, 1,2- (total)	1	15	2.57E-01	N/A	0.10	2.74E+01	3.77E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	#N/A
108678	Trimethylbenzene, 1,3,5-	1	15	3.34E+00	N/A	0.10	2.74E+01	3.86E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	6.0E-03
104518	n-Butylbenzene	1	15	5.02E+00	N/A	0.10	2.74E+01	4.41E-04	1.23E+03	#NUM!	1.08E-06	N/A	#N/A	#N/A
91203	Naphthalene	1	15	4.00E+00	4.27E+03	0.10	2.74E+01	4.70E-04	1.23E+03	9.67E+307	1.08E-06	4.61E-02	N/A	3.0E-03
99876	Isopropyltoluene, 4-	1	15	3.16E+00	N/A	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	4.0E-01
135988	Butylbenzene, sec-	1	15	6.22E+01	N/A	0.10	2.74E+01	4.66E-04	1.23E+03	5.47E+297	1.08E-06	N/A	#N/A	#N/A
74873	Chloromethane	1	15	2.66E-02	3.24E+05	0.10	2.74E+01	7.68E-04	1.23E+03	1.14E+189	1.08E-06	3.51E+00	N/A	9.0E-02
75014	Vinyl chloride	1	15	3.72E-02	6.48E+05	0.10	2.74E+01	6.44E-04	1.23E+03	5.27E+224	1.08E-06	6.99E+00	8.8E-06	1.0E-01
74839	Bromomethane	1	15	2.66E-02	N/A	0.10	2.74E+01	4.48E-04	1.23E+03	#NUM!	1.08E-06	N/A	N/A	5.0E-03
75003	Ethyl Chloride	1	15	2.66E-02	1.12E+05	0.10	2.74E+01	7.66E-04	1.23E+03	1.14E+189	1.08E-06	1.21E+00	N/A	1.0E+01
75354	1,1-Dichloroethylene	1	15	1.18E-01	2.04E+05	0.10	2.74E+01	5.47E-04	1.23E+03	3.62E+264	1.08E-05	2.21E+00	N/A	2.0E-01
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	1	15	4.50E-01	N/A	0.10	2.74E+01	1.76E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	3.0E+01
67641	Acetone	1	15	1.15E-03	1.37E+03	0.10	2.74E+01	2.07E-03	1.23E+03	9.18E+69	1.09E-05	1.48E-02	N/A	N/A
75150	Carbon Disulfide	1	15	1.03E-01	N/A	0.10	2.74E+01	6.34E-04	1.23E+03	1.25E+228	1.08E-06	N/A	N/A	7.0E-01
78209	Methyl Acetate	1	15	6.64E-03	N/A	0.10	2.74E+01	6.61E-04	1.23E+03	1.17E+188	1.08E-06	N/A	#N/A	#N/A
75092	Methylene chloride	1	15	2.34E-02	1.60E+05	0.10	2.74E+01	6.35E-04	1.23E+03	8.55E+227	1.08E-06	1.73E+00	4.7E-07	3.0E+00
156605	trans-1,2-Dichloroethylene	1	15	1.06E-01	8.20E+04	0.10	2.74E+01	4.32E-04	1.23E+03	#NUM!	1.08E-05	8.85E-01	N/A	2.0E-01
1634044	Methyl-Tertiary-Butyl Ether	1	15	7.68E-02	4.58E+03	0.10	2.74E+01	6.67E-04	1.23E+03	9.48E+216	1.08E-05	4.96E-02	N/A	3.0E+00
75343	1,1-Dichloroethane	1	15	6.32E-02	1.62E+05	0.10	2.74E+01	4.58E-04	1.23E+03	#NUM!	1.08E-05	1.75E+00	N/A	5.0E-01
156592	cis-1,2-Dichloroethylene	1	15	7.10E-02	5.66E+04	0.10	2.74E+01	4.59E-04	1.23E+03	#NUM!	1.08E-05	6.12E-01	N/A	2.0E-01
78933	Butanone, 2- (MEK)	1	15	7.66E-03	N/A	0.10	2.74E+01	9.45E-04	1.23E+03	1.18E+153	1.08E-05	N/A	N/A	N/A
71556	1,1,1-Trichloroethane	1	15	2.20E-01	N/A	0.10	2.74E+01	4.75E-04	1.23E+03	4.36E+304	1.08E-05	N/A	N/A	2.2E+00
110827	Cyclohexane	1	15	3.20E-01	N/A	0.10	2.74E+01	4.85E-04	1.23E+03	3.16E+298	1.08E-05	N/A	#N/A	#N/A
71432	Benzene	1	15	1.18E-01	7.41E+04	0.10	2.74E+01	5.42E-04	1.23E+03	1.61E+267	1.08E-05	8.02E-01	7.8E-06	3.0E-02
79016	Trichloroethylene	1	15	3.32E-01	1.09E+05	0.10	2.74E+01	4.83E-04	1.23E+03	3.77E+298	1.08E-05	1.18E+00	1.1E-04	4.0E-02
108872	Methyl cyclohexane	1	15	5.36E-01	3.36E+06	0.10	2.74E+01	5.98E-04	1.23E+03	1.50E+242	1.08E-05	3.62E+01	N/A	3.0E+00
108883	Toluene	1	15	3.64E-01	1.28E+05	0.10	2.74E+01	5.34E-04	1.23E+03	1.10E+271	1.08E-05	1.39E+00	N/A	4.0E-01
127184	Tetrachloroethylene	1	15	3.16E-01	9.19E+04	0.10	2.74E+01	4.39E-04	1.23E+03	#NUM!	1.08E-05	8.92E-01	5.9E-06	N/A
108907	Chlorobenzene	1	15	4.38E-01	3.21E+04	0.10	2.74E+01	4.56E-04	1.23E+03	#NUM!	1.08E-05	3.46E-01	N/A	5.0E-02
100414	Ethylbenzene	1	15	7.26E-01	2.56E+04	0.10	2.74E+01	4.60E-04	1.23E+03	#NUM!	1.08E-05	2.90E-01	N/A	1.0E+00
1330207	Xylenes	1	15	4.82E-01	N/A	0.10	2.74E+01	3.75E-03	1.23E+03	4.03E+38	1.09E-05	N/A	N/A	1.0E-01
100425	Styrene	1	15	1.56E+00	N/A	0.10	2.74E+01	4.47E-04	1.23E+03	#NUM!	1.08E-05	N/A	#N/A	#N/A
98828	Isopropylbenzene	1	15	1.86E+01	N/A	0.10	2.74E+01	3.85E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	4.0E-01
79345	1,1,2,2-Tetrachloroethane	1	15	1.87E-01	N/A	0.10	2.74E+01	5.85E-04	1.23E+03	1.98E+256	1.08E-05	N/A	#N/A	#N/A
541731	Dichlorobenzene, 1,3-	1	15	3.40E-01	3.19E+04	0.10	2.74E+01	2.56E-04	1.23E+03	#NUM!	1.07E-05	3.42E-01	N/A	N/A
106467	1,4-Dichlorobenzene	1	15	1.23E+00	6.68E+03	0.10	2.74E+01	4.36E-04	1.23E+03	#NUM!	1.08E-05	7.19E-02	N/A	8.0E-01
95501	1,2-Dichlorobenzene	1	15	1.07E-01	3.94E+00	0.10	2.74E+01	3.94E-02	1.23E+03	4.74E+03	1.09E-05	4.26E-05	N/A	N/A
120821	1,2,4-Trichlorobenzene	1	15	3.58E+00	N/A	0.10	2.74E+01	2.25E-04	1.23E+03	#NUM!	1.07E-05	N/A	N/A	2.0E-01
100527	Benzaldehyde	1	15	6.54E-02	N/A	0.10	2.74E+01	1.35E-03	1.23E+03	2.80E+107	1.08E-05	N/A	#N/A	#N/A
91576	Methylnaphthalene, 2-	1	15	1.70E+01	1.20E+04	0.10	2.74E+01	3.13E-04	1.23E+03	#NUM!	1.08E-05	1.29E-01	N/A	3.0E-03
92524	Biphenyl, 1,1-	1	15	1.25E+01	N/A	0.10	2.74E+01	3.15E-04	1.23E+03	#NUM!	1.08E-05	N/A	N/A	N/A
208968	Acenaphthylene	1	15	9.57E+00	4.31E+02	0.10	2.74E+01	3.38E-04	1.23E+03	#NUM!	1.08E-05	4.64E-03	N/A	3.0E-03
83329	Acenaphthene	1	15	1.42E+01	N/A	0.10	2.74E+01	7.33E-04	1.23E+03	2.13E+197	1.08E-05	N/A	N/A	3.0E-03
132649	Dibenzofuran	1	15	1.63E+01	1.84E+04	0.10	2.74E+01	1.88E-04	1.23E+03	#NUM!	1.07E-05	1.75E-01	N/A	N/A
86737	Fluorene	1	15	1.54E+01	N/A	0.10	2.74E+01	8.16E-01	1.23E+03	1.50E+00	3.24E-05	N/A	N/A	3.0E-03
85018	Phenanthrene	1	15	2.83E+01	8.27E+03	0.10	2.74E+01	3.50E-04	1.23E+03	#NUM!	1.08E-05	6.78E-02	N/A	3.0E-03
120127	Anthracene	1	15	5.90E+01	N/A	0.10	2.74E+01	1.80E-03	1.23E+03	5.14E+90	1.08E-05	N/A	N/A	3.0E-03
C5-C8	C5-C8 Aliphatics	1	15	4.53E+00	3.84E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	4.14E+03	N/A	2.0E-01
C9-C12	C9-C12 Aliphatics	1	15	3.00E+02	6.78E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	7.29E+01	N/A	2.0E-01
C9-C10	C9-C10 Aromatics	1	15	3.56E+00	1.95E+07	0.10	2.74E+01	3.59E-04	1.23E+03	#NUM!	1.08E-05	2.10E+02	N/A	5.0E-02
C9-C18	C9-C18 Aliphatics	1	15	1.36E+03	1.58E+06	0.10	2.74E+01	3.84E-04	1.23E+03	#NUM!	1.08E-05	1.70E+03	N/A	2.0E-01
C11-C22	C11-C22 Aromatics	1	15	1.00E+01	5.23E+06	0.10	2.74E+01	4.27E-04	1.23E+03	#NUM!	1.08E-05	6.72E+01	N/A	5.0E-02

Appendix C 4
Johnson & Ettinger Model - Data Entry Screen
Inhalation of Volatiles from Soil
Future Adult Recreational Scenario - RME
Southwest Properties, Wells G&H Superfund Site, Operable Unit 2
Whitney Barrel

Chemical CAS No. (numbers only, no dashes)	Chemical	RISK-BASED SOIL CONCENTRATION CALCULATIONS: Indoor exposure soil conc., carcinogen (ug/kg)	Indoor exposure soil conc., noncarcinogen (ug/kg)	Risk-based indoor exposure soil conc., (ug/kg)	Soil saturation conc., C_{sat} (ug/kg)	Final Indoor exposure soil conc., (ug/kg)	INCREMENTAL RISK CALCULATIONS: Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
95636	Trimethylbenzene, 1,2,4-	NA	NA	NA	4.35E+05	NA	NA	NA
540590	Dichloroethylene, 1,2- (total)	NA	NA	NA	5.95E+02	NA	NA	NA
108678	Trimethylbenzene, 1,3,5-	NA	NA	NA	7.13E+04	NA	NA	NA
104518	n-Butylbenzene	NA	NA	NA	6.83E+03	NA	NA	NA
91203	Naphthalene	NA	NA	NA	1.30E+05	NA	NA	3.4E-04
99876	Isopropyltoluene, 4-	NA	NA	NA	7.31E+05	NA	NA	NA
135988	Butylbenzene, sec-	NA	NA	NA	1.10E+06	NA	NA	NA
74873	Chloromethane	NA	NA	NA	1.37E+06	NA	NA	8.7E-04
75014	Vinyl chloride	NA	NA	NA	8.33E+05	NA	4.7E-07	1.6E-03
74839	Bromomethane	NA	NA	NA	3.89E+06	NA	NA	NA
75003	Ethyl Chloride	NA	NA	NA	1.37E+06	NA	NA	2.7E-06
75354	1,1-Dichloroethylene	NA	NA	NA	6.39E+05	NA	NA	2.5E-04
76131	Trichloro-1,2,2-trifluoroethane, 1,1,2-	NA	NA	NA	3.99E+05	NA	NA	NA
67641	Acetone	NA	NA	NA	2.01E+08	NA	NA	NA
75150	Carbon Disulfide	NA	NA	NA	8.78E+05	NA	NA	NA
79209	Methyl Acetate	NA	NA	NA	5.03E+07	NA	NA	NA
75092	Methylene chloride	NA	NA	NA	2.96E+06	NA	6.2E-09	1.3E-05
156605	trans-1,2-Dichloroethylene	NA	NA	NA	2.12E+06	NA	NA	9.8E-05
1634044	Methyl-Tertiary-Butyl Ether	NA	NA	NA	1.42E+07	NA	NA	3.7E-07
75343	1,1-Dichloroethane	NA	NA	NA	1.39E+06	NA	NA	7.8E-05
156592	cis-1,2-Dichloroethylene	NA	NA	NA	9.75E+05	NA	NA	6.6E-05
78933	Butanone, 2- (MEK)	NA	NA	NA	4.63E+07	NA	NA	NA
71556	1,1,1-Trichloroethane	NA	NA	NA	6.01E+05	NA	NA	NA
110827	Cyclohexane	NA	NA	NA	3.85E+05	NA	NA	NA
71432	Benzene	NA	NA	NA	5.74E+05	NA	4.8E-06	5.9E-04
79016	Trichloroethylene	NA	NA	NA	6.05E+05	NA	9.9E-07	6.6E-04
108872	Methyl cyclohexane	NA	NA	NA	2.95E+04	NA	NA	2.7E-04
108883	Toluene	NA	NA	NA	3.02E+05	NA	NA	7.7E-05
127184	Tetrachloroethylene	NA	NA	NA	1.06E+05	NA	4.5E-08	NA
108907	Chlorobenzene	NA	NA	NA	3.04E+05	NA	NA	1.3E-04
100414	Ethylbenzene	NA	NA	NA	1.52E+05	NA	NA	6.5E-06
1330207	Xylenes	NA	NA	NA	1.50E+05	NA	NA	NA
100425	Styrene	NA	NA	NA	5.44E+05	NA	NA	NA
98828	Isopropylbenzene	NA	NA	NA	1.08E+05	NA	NA	NA
79345	1,1,2,2-Tetrachloroethane	NA	NA	NA	1.15E+06	NA	NA	NA
541731	Dichlorobenzene, 1,3-	NA	NA	NA	3.82E+04	NA	NA	NA
106467	1,4-Dichlorobenzene	NA	NA	NA	1.06E+05	NA	NA	2.0E-06
95501	1,2-Dichlorobenzene	NA	NA	NA	8.50E+04	NA	NA	NA
120821	1,2,4-Trichlorobenzene	NA	NA	NA	1.13E+06	NA	NA	NA
100527	Benzaldehyde	NA	NA	NA	1.74E+05	NA	NA	NA
91576	Methylnaphthalene, 2-	NA	NA	NA	4.24E+05	NA	NA	9.6E-04
92524	Biphenyl, 1,1-	NA	NA	NA	8.81E+04	NA	NA	NA
208968	Acenaphthylene	NA	NA	NA	3.84E+04	NA	NA	3.4E-05
83329	Acenaphthene	NA	NA	NA	6.09E+04	NA	NA	NA
132649	Dibenzofuran	NA	NA	NA	1.65E+05	NA	NA	NA
86737	Fluorene	NA	NA	NA	2.97E+04	NA	NA	NA
85018	Phenanthrene	NA	NA	NA	3.64E+04	NA	NA	5.0E-04
120127	Anthracene	NA	NA	NA	2.57E+03	NA	NA	NA
C5-C8	C5-C8 Aliphatics	NA	NA	NA	7.88E+07	NA	NA	4.6E-01
C9-C12	C9-C12 Aliphatics	NA	NA	NA	2.12E+07	NA	NA	8.1E-03
C9-C10	C9-C10 Aromatics	NA	NA	NA	1.92E+06	NA	NA	9.3E-02
C9-C18	C9-C18 Aliphatics	NA	NA	NA	1.35E+07	NA	NA	1.9E-01
C11-C22	C11-C22 Aromatics	NA	NA	NA	6.92E+07	NA	NA	3.0E-02

	95% UCL Cancer Risk	95% UCL HI
TOTAL:	2E-06	7.9E-01

[ ] = Cancer risk > 1E-06 or HQ/HI>1E+00

Trimethylbenzene, 1,2,4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Dichloroethylene, 1,2- (total)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Trimethylbenzene, 1,3,5-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
n-Butylbenzene	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Naphthalene	
Isopropyltoluene, 4-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Butylbenzene, sec-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Chloromethane	
Vinyl chloride	
Bromomethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Ethyl Chloride	
1,1-Dichloroethylene	
Trichloro-1,2,2-trifluoroethane, 1,1,2-	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Acetone	
Carbon Disulfide	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methyl Acetate	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Methylene chloride	
trans-1,2-Dichloroethylene	
Methyl-Tertiary-Butyl Ether	
1,1-Dichloroethane	
cis-1,2-Dichloroethylene	
Butanone, 2- (MEK)	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
1,1,1-Trichloroethane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Cyclohexane	MESSAGE: Soil conc. >= saturation (Csat). Risk/HQ calculated at Csat.
Benzene	
Trichloroethylene	