APPENDIX F

SUMMARY OF CHEMICAL-SPECIFIC HUMAN HEALTH RISK/HAZARD SITE-WIDE ESTIMATES

Table F-1. Summary of Human Health Site-Wide Risks and Hazards for COPCs in Soil

AOPC Where Maximum Soil Concentration Detected	Analytes	Max Concentration (mg/kg)	U.S. EPA Residential PRG-ca (mg/kg)	U.S. EPA Residential PRG-nc (mg/kg)	Cancer Risk Estimate	Noncancer Hazard Estimate
R4	2,4,5-Trichlorophenol	0.0096	NA	6100	ND	1.57E-06
193	2,6-DNT	0.2	NA	61	ND	3.28E-03
R3	2-Methylnaphthalene	0.0044	1.7	NA	2.59E-09	ND
R1	2-Nitroaniline	0.0053	NA	180	ND	2.94E-05
PDD	Total DDT	0.36	1.7	NA	2.12E-07	ND
R4	Acenaphthylene	0.0032	NA	3700	ND	8.65E-07
R5	Acetone	0.044	NA	14000	ND	3.14E-06
SPN	Acetophenone	0.039	NA	6100	ND	6.39E-06
R1	Anthracene	0.0036	NA	22000	ND	1.64E-07
R4	Antimony	0.67	NA	31	ND	2.16E-02
R1	Barium	275	NA	5400	ND	5.09E-02
R5	Benz(a)anthracene	0.014	0.62	NA	2.26E-08	ND
R2	Benzaldehyde	0.034	NA	6100	ND	5.57E-06
R4	Benzo(a)pyrene	0.016	0.062	NA	2.58E-07	ND
R4	Benzo(b)fluoranthene	0.026	0.62	NA	4.19E-08	ND
R4	Benzo(g,h,i)perylene	0.022	NA	2300	ND	9.57E-06
R4	Benzo(k)fluoranthene	0.0085	0.38	NA	2.24E-08	ND
R3	Beryllium	1.1	NA	150	ND	7.33E-03
R3	Bis(2-ethylhexyl) Phthalate	0.37	35	NA	1.06E-08	ND
R1	Butyl Benzyl Phthalate	0.017	NA	12000	ND	1.42E-06
R4	Cadmium	1.4	NA	37	ND	3.78E-02
R3	Caprolactam	0.019	NA	31000	ND	6.13E-07
SPN	Carbazole	0.0025	24	NA	1.04E-10	ND
R2	Chromium (total)	114	210	NA	5.43E-07	ND
R5	Chrysene	0.019	3.8	NA	5.00E-09	ND
R3	Cobalt	55.8	900	NA	6.20E-08	ND
R4	Copper	62	NA	3100	ND	2.00E-02
R4	Dibenz(a,h)anthracene	0.004	0.062	NA	6.45E-08	ND
RSP	Diethyl Phthalate	0.0067	NA	49000	ND	1.37E-07
R4	Fluoranthene	0.022	NA	2300	ND	9.57E-06
193	HMX	0.69	NA	3100	ND	2.23E-04
R4	Indeno(1,2,3-cd)pyrene	0.02	0.62	NA	3.23E-08	ND
R5	m,p-Xylenes	0.002	NA	270	ND	7.41E-06
193	Mercury	0.482	NA	23	ND	2.10E-02
R1	Methylene Chloride	0.0035	9.1	NA	3.85E-10	ND
R3	Naphthalene	0.0025	1.7	NA	1.47E-09	ND
R5	o-Xylene	0.0011	NA	270	ND	4.07E-06
R1	Phenanthrene	0.014	NA	22000	ND	6.36E-07
R1	Phenol	0.014	NA	18000	ND	7.78E-07
R5	Pyrene	0.019	NA	2300	ND	8.26E-06
RSP	Selenium	0.7	NA	390	ND	1.79E-03
193	Silver	4.81	NA	390	ND	1.23E-02
PDD	Thallium	0.185	NA	5.2	ND	3.56E-02
193	Dioxin-Like PCBs [c]	6.90E-07	3.90E-06	NA	1.77E-07	ND
193	NonDioxin-Like PCBs [c]	0.027	0.22	NA	1.23E-07	ND
SPN	Zinc	157	NA	23000	ND	6.83E-03
Total					**1.58E-06**	**2.19E-01**

(a) Sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT.
(b) U.S. EPA, 2004
(c) Refer to Attachment F.1 for concentration determinations.
AOPC – area of potential concern NA – not applicable
ND- not determined because an applicable PRG is not available.
PDD – Perimeter Drainage Ditch; RSP – Revetment Spoils Pile; SPN – Spoils Pile N; R1 – Revetment 1; R2 – Revetment 2; R3 – Revetment 3; R4 – Revetment 4; R5 – Revetment 5;

Table F-2. Summary of Site-Wide Human Health Risks/Hazards for Groundwater

AOPC	Analytes	Maximum Concentration Detected (µg /l)	USEPA Residential PRG (ca) (µg /l)	USEPA Residential PRG (nc) (µg /l)	Cancer Risk Estimate	Noncancer Hazard Estimate
R5	1,3-Dichlorobenzene	0.11	NA	180	ND	6.11E-04
R5	2,4-Dichlorophenol	0.03	NA	110	ND	2.73E-04
R1	2-Methylnaphthalene	0.13	0.093	NA	1.40E-06	ND
R2	4-Chloro-3-methylphenol	0.12	NA	30	ND	4.00E-03
R3	4-Chloroaniline	0.027	NA	150	ND	1.80E-04
R4	Acetophenone	0.48	NA	3600	ND	1.33E-04
RSP	Antimony	0.838	NA	15	ND	5.59E-02
R2	Arsenic	88.7	0.0071	NA	1.25E-02	ND
R2	Barium	1130	NA	2600	ND	4.35E-01
R2	Benzaldehyde	1	NA	3600	ND	2.78E-04
R2	Benzene	0.15	0.35	NA	4.29E-07	ND
R2	Beryllium	6.1	NA	73	ND	8.36E-02
R1	Biphenyl	0.083	NA	300	ND	2.77E-04
R1	Bis(2-ethylhexyl) Phthalate	15	4.8	NA	3.13E-06	ND
R3	Bromomethane	0.87	NA	8.7	ND	1.00E-01
R1	Caprolactam	2.1	NA	18000	ND	1.17E-04
R2	Cadmium	11.9	NA	18	ND	6.61E-01
R2	Chromium (used Cr III)	320	NA	55000	ND	5.82E-03
R3	*cis*-1,2-Dichloroethene	6.5	NA	61	ND	1.07E-01
R2	Cobalt	155	NA	730	ND	2.12E-01
R2	Copper	245	NA	1500	ND	1.63E-01
R2	Fluoranthene	0.033	NA	1500	ND	2.20E-05
R1	Fluorene	0.056	NA	240	ND	2.33E-04
R3	Mercury	0.4	NA	11	ND	3.64E-02
R2	Isophorone	0.66	71	NA	9.30E-09	ND
R1	Naphthalene	0.19	0.093	NA	2.04E-06	ND
R2	Nickel	453	NA	730	ND	6.21E-01
R2	Lead	424	NA	NA	ND	ND
R1	Phenanthrene	0.17	NA	1800	ND	9.44E-05
SPN	Phenol	0.085	NA	11000	ND	7.73E-06
R1	Pyrene	0.046	NA	180	ND	2.56E-04
RSP	Selenium	4.6	NA	180	ND	2.56E-02
R2	Silver	1.77	NA	180	ND	9.83E-03
R3	Trichloroethene	0.28	1.4	NA	2.00E-07	ND
R2	Thallium	1.01	NA	2.4	ND	4.21E-01
R3	Toluene	1.1	NA	720	ND	1.53E-03
R3	*trans*-1,2-Dichloroethene	0.19	NA	120	ND	1.58E-03
R2	Vanadium	393	NA	36	ND	1.09E+01
R2	Zinc	762	NA	11000	ND	6.93E-02
Total					**1.25E-02**	**1.39E+01**

(a) U.S. EPA, 2004
(b) Maximum concentrations for metals were obtained from R3-GW01-Dup; samples collected from R3-GW01 were not used because these samples had a noticeable difference of turbidity compared to R3-GW01-Dup.
AOPC – area of potential concern
NA - not applicable
ND- not determined because an applicable PRG is not available.
ca – cancer; nc – noncancer
RSP – Revetment Spoils Pile; R1 – Revetment 1; R2 – Revetment 2; R3 – Revetment 3; R4 – Revetment 4; R5 – Revetment 5; SPN – Spoils Pile N

ATTACHMENT F.1
PCB TOXIC EQUIVALENT FACTOR (TEF) ADJUSTMENTS FOR HUMAN HEALTH RISK EVALUATIONS IN SOIL

Dioxin-like PCB[b]	Toxic Equivalent Factor (TEF)[a]	TEF-Adjusted Maximum Concentration (mg/kg)
Cl5(105)	0.0001	1.6E-07
Cl5(118)	0.0001	4.0E-07
Cl7(170)	0.0001	1.1E-07
Cl7(180)	0.00001	1.9E-08
Concentration Sum (mg/kg)		6.9E-07
Risk Estimate (unitless)[c]		1.8E-07

Non-Dioxin-like PCB	Maximum Concentration (mg/kg)
Cl2(8)	1.0E-04
Cl3(18)	5.0E-05
Cl3(28)	2.0E-04
Cl4(44)	4.7E-04
Cl4(52)	1.4E-03
Cl4(66)	1.5E-04
Cl5(101)	5.6E-03
Cl6(128)	1.4E-03
Cl6(138)	7.9E-03
Cl6(153)	7.9E-03
Cl7(187)	1.1E-03
Cl8(195)	3.6E-04
Cl9(206)	5.9E-04
Cl10(209)	3.9E-04
Concentration Sum (mg/kg)	2.7E-02
Risk Estimate (unitless)[d]	1.2E-07

(a) TEFs obtained from Van den Berg et al., 1996.
(b) Analytical results for PCBs in soil located in Table C-7 of Appendix C.
(c) Risk estimates derived by dividing the concentration sum by the U.S. EAP's preliminary remediation goals (PRGs). For dioxin-like PCBs, the PRG of 3.9×10^{-6} mg/kg for 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) was used, and for the nondioxin-like PCBs, the PRG of 0.22 mg/kg for Aroclor 1254 was used.

ATTACHMENT F.2
SOIL AND GROUNDWATER INDOOR AIR CALCULATIONS FOR THE HUMAN HEALTH RISK EVALUATION

Table F.2-1. Summary of Risk/Hazard for Indoor Air Exposure tothe Hypothetical Resident

Analyte	Soil to Indoor Air		Groundwater to Indoor Air	
	Risk	Hazard	Risk	Hazard
2-Methylnaphthalene	NA	6.70E-04	NA	1.10E-05
Acetophenone	NA	6.05E-04	NA	3.23E-07
Benzaldehyde	NA	1.32E-03	NA	1.46E-06
Benzo(b)fluoranthene	4.81E-09	NA	ND	ND
Chrysene	9.63E-10	NA	ND	ND
Fluorene	ND	ND	NA	2.82E-07
Naphthalene	5.57E-07	1.27E-02	1.73E-08	3.95E-04
Pyrene	NA	9.80E-07	NA	6.02E-08
cis-1,2-Dichloroethene	ND	ND	NA	1.18E-02
trans-1,2-Dichloroethene	ND	ND	NA	3.82E-04
1,3-Dichlorobenzene	ND	ND	NA	4.69E-05
Acetone	NA	5.72E-03	ND	ND
Benzene	ND	ND	1.85E-07	4.96E-04
Bromomethane	ND	ND	NA	1.69E-02
Methylene chloride	3.10E-06	1.81E-02	ND	ND
Toluene	ND	ND	NA	4.28E-04
Trichloroethene	ND	ND	4.03E-08	7.84E-05
m,p-Xylenes	NA	2.31E-02	ND	ND
o-Xylenes	NA	9.20E-03	ND	ND
Total	3.67E-06	7.14E-02	2.43E-07	3.05E-02

EXHIBIT F.2-1
Soil to Indoor Air Example Calculation for Methylene Chloride
(U.S. EPA's Johnson & Ettinger Model) [a]

SL-SCREEN
Version 3.1; 02/04

Reset to Defaults

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

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)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
75092	3.50E+00	Methylene chloride

MORE ↓

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_t (cm)	ENTER Average soil 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)
15	15	20			1.00E-08

MORE ↓

ENTER Vandose zone SCS soil type (Lookup Soil Parameters)	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 Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
	1.5	0.43	0.197	0.002	5

MORE ↓

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 Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

END

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 (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)	Physical state at soil temperature, (S,L,G)
1.01E-01	1.17E-05	2.18E-03	25	6,706	313.00	510.00	1.17E+01	1.30E+04	1.0E-06	4.0E-01	L

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)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (μg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1	0.233	#N/A	#N/A	#N/A	1.00E-08	4,000	3.50E+00	1.69E+04

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)	Diffusion path length, L_d (cm)
1.00E+06	4.00E-04	15	6,927	1.79E-03	7.44E-02	1.78E-04	4.28E-03	1

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (μg/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., $C_{building}$ (μg/m^3)
15	2.34E-02	1.57E+03	0.10	8.33E+01	4.28E-03	4.00E+02	3.81E+211	4.82E-03	7.55E+00

Unit risk factor, URF (μg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
1.0E-06	4.0E-01

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

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)
NA	NA	NA	2.17E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
3.1E-06	1.8E-02

(a) A slab on grade building was assumed in conjunction with U.S. EPA's spreadsheet default settings. VOCs evaluated for vapor intrusion included all compounds detected in soil that are listed in Table 1 *List of Chemicals to be Considered for the Vapor Intrusion Pathway* provided in DTSC's Guidance, "The Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air" (2004).

EXHIBIT F.2-2
Groundwater to Indoor Air Example Calculations for Benzene
(DTSC-modified Johnson & Ettenger Spreadsheets) [a]

GW-SCREEN
Version 3.0; 04/03

Reset to Defaults

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]

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 1/21/05)

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432	1.50E-01	Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	168	S	24	5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	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)
		1.00E-08		1.5	0.43	0.15

MORE ↓

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)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

ABC

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)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	5.89E+01	1.79E+03	2.9E-05	3.0E-02

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, X_{crack} (cm)
153	0.280	#N/A	#N/A	#N/A	1.00E-08	17.05	0.375	0.122	0.253	4,000

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} ($atm\text{-}m^3/mol$)	Henry's law constant at ave. groundwater 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)
3.39E+04	1.00E+06	5.00E-03	15	7,977	5.29E-03	2.17E-01	1.80E-04	6.86E-03	5.67E-04	3.07E-03

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)
153	15	3.25E+01	1.25	8.33E+01	6.86E-03	5.00E+03	3.50E+10	4.77E-04	1.55E-02	2.9E-05	3.0E-02

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen ($\mu g/L$)	Indoor exposure groundwater conc., noncarcinogen ($\mu g/L$)	Risk-based indoor exposure groundwater conc., ($\mu g/L$)	Pure component water solubility, S ($\mu g/L$)	Final indoor exposure groundwater conc., ($\mu g/L$)
NA	NA	NA	1.79E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.8E-07	5.0E-04

(a) A slab on grade building was assumed in conjunction with DTSC's spreadsheet default settings. VOCs evaluated for vapor intrusion included all compounds detected in groundwater that are listed in Table 1 in *List of Chemicals to be Considered for the Vapor Intrusion Pathway* provided in DTSC's Guidance, "The Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air" (2004).