Table B-1
Toxicological Properties of Chemicals of Concern

Chemicals of Concern	CAS #	Slope Factor			Reference Dose			Absorption Factor		Permeability Constant, K_p	Relative Contribution of Permeability Coefficient, B	Lag Time, τ_{event}	Duration of Event, t*	Fraction Absorbed Water, FA
		Oral, SF_o	Inhalation, SF_i	Dermal, SF_d	Oral, RfD_o	Inhalation, RfD_i	Dermal, RfD_d	Dermal, RAF_d	Oral, RAF_o					
		$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	$(mg/kg\text{-}day)^{-1}$	(mg/kg-day)	(mg/kg-day)	(mg/kg-day)	(unitless)	(unitless)	(cm/hr)	(unitless)	(hr/event)	(hr)	(unitless)
Benzene	71-43-2	3.5E-02	1.8E-02	3.5E-02	4.0E-03	8.6E-03	4.0E-03	N/A	1.0	0.015	5.05E-02	2.92E-01	7.00E-01	1.00
Toluene	108-88-3	NA	NA	NA	8.0E-02	1.4E+00	8.0E-02	N/A	1.0	0.031	1.15E-01	3.50E-01	8.39E-01	1.00
Ethylbenzene	100-41-4	NA	NA	NA	1.0E-01	2.9E-01	1.0E-01	N/A	1.0	0.049	1.95E-01	4.20E-01	1.01E+00	1.00
Xylenes (total)	1330-20-7	NA	NA	NA	2.0E-01	2.9E-02	2.0E-01	N/A	1.0	0.029	1.14E-01	4.13E-01	9.92E-01	1.00
Ethylene dibromide (EDB)	106-93-4	2.0E+00	2.1E+00	2.0E+00	9.0E-03	2.6E-03	9.0E-03	N/A	1.0	0.003	1.46E-02	1.21E+00	2.90E+00	1.00
Ethylene dichloride (EDC)	107-06-2	9.1E-02	9.1E-02	9.1E-02	2.0E-02	1.4E-03	2.0E-02	N/A	1.0	0.004	1.61E-02	3.82E-01	9.18E-01	1.00
Methyl tertiary butyl ether (MTBE)	1634-04-4	1.8E-03	9.1E-04	1.8E-03	8.6E-01	8.6E-01	8.6E-01	N/A	1.0	0.003	1.23E-02	3.28E-01	7.87E-01	1.00
Acenaphthene	83-32-9	NA	NA	NA	6.0E-02	6.0E-02	6.0E-02	0.13	1.0	0.102	4.89E-01	7.68E-01	1.84E+00	1.00
Anthracene	120-12-7	NA	NA	NA	3.0E-01	3.0E-01	3.0E-01	0.13	1.0	0.192	9.88E-01	1.05E+00	4.04E+00	0.97
Benzo(a)anthracene	56-55-3	7.3E-01	3.9E-01	7.3E-01	NA	NA	NA	0.13	1.0	0.474	2.75E+00	2.03E+00	8.53E+00	1.00
Benzo(a)pyrene	50-32-8	7.3E+00	3.9E+00	7.3E+00	NA	NA	NA	0.13	1.0	0.701	4.27E+00	2.69E+00	1.17E+01	1.00
Benzo(b)fluoranthene	205-99-2	7.3E-01	3.9E-01	7.3E-01	NA	NA	NA	0.13	1.0	0.702	4.29E+00	2.77E+00	1.20E+01	1.00
Benzo(k)fluoranthene	207-08-9	7.3E-02	3.9E-01	7.3E-02	NA	NA	NA	0.13	1.0	0.869	5.31E+00	2.72E+00	1.20E+01	0.79
Chrysene	218-01-9	7.3E-03	3.9E-02	7.3E-03	NA	NA	NA	0.13	1.0	0.474	2.75E+00	2.03E+00	8.53E+00	1.00
Dibenzo(a,h)anthracene	53-70-3	7.3E+00	4.1E+00	7.3E+00	NA	NA	NA	0.13	1.0	1.508	9.68E+00	3.88E+00	1.76E+01	0.60
Fluoranthene	206-44-0	NA	NA	NA	4.0E-02	4.0E-02	4.0E-02	0.13	1.0	0.224	1.22E+00	1.45E+00	5.68E+00	1.00
Fluorene	86-73-7	NA	NA	NA	4.0E-02	4.0E-02	4.0E-02	0.13	1.0	0.136	6.75E-01	8.97E-01	3.50E+00	1.00
Naphthalene	91-20-3	1.2E-01	1.2E-01	1.2E-01	2.0E-02	8.6E-04	2.0E-02	0.13	1.0	0.047	2.03E-01	5.58E-01	1.34E+00	1.00
Pyrene	129-00-0	NA	NA	NA	3.0E-02	3.0E-02	3.0E-02	0.13	1.0	0.326	1.79E+00	1.43E+00	5.76E+00	0.95
TPH-GRO														
TPH-DRO														
TPH-ORO														
Aliphatics - > C6-C8	NA	NA	NA	NA	5.0E+00	5.3E+00	5.0E+00	N/A	1.0	NA	NA	NA	NA	NA
Aliphatics - > C8-C10	NA	NA	NA	NA	1.0E-01	2.9E-01	1.0E-01	N/A	1.0	NA	NA	NA	NA	NA
Aliphatics - >C10-C12	NA	NA	NA	NA	1.0E-01	2.9E-01	1.0E-01	0.1	1.0	NA	NA	NA	NA	NA
Aliphatics - >C12-C16	NA	NA	NA	NA	1.0E-01	2.9E-01	1.0E-01	0.1	1.0	NA	NA	NA	NA	NA
Aliphatics - >C16-C21	NA	NA	NA	NA	2.0E+00	NA	2.0E+00	0.1	1.0	NA	NA	NA	NA	NA
Aliphatics - >C21-C35	NA	NA	NA	NA	2.0E+00	NA	2.0E+00	0.1	1.0	NA	NA	NA	NA	NA
Aromatics - >C8-C10	NA	NA	NA	NA	4.0E-02	5.7E-02	4.0E-02	N/A	1.0	NA	NA	NA	NA	NA
Aromatics - >C10-C12	NA	NA	NA	NA	4.0E-02	5.7E-02	4.0E-02	0.1	1.0	NA	NA	NA	NA	NA
Aromatics - >C12-C16	NA	NA	NA	NA	4.0E-02	5.7E-02	4.0E-02	0.1	1.0	NA	NA	NA	NA	NA
Aromatics - >C16-C21	NA	NA	NA	NA	3.0E-02	NA	3.0E-02	0.13	1.0	NA	NA	NA	NA	NA
Aromatics - >C21-C35	NA	NA	NA	NA	3.0E-02	NA	3.0E-02	0.13	1.0	NA	NA	NA	NA	NA
Tertiary-amyl-methyl-ether (TAME)	994-05-8	NA	NA	NA	4.0E-02	2.3E-02	4.0E-02	N/A	1.0	0.007	2.63E-02	3.92E-01	9.40E-01	1.00
Tertiary-butyl-alcohol (TBA)	75-65-0	NA	NA	NA	9.0E-02	8.6E-02	9.0E-02	N/A	1.0	0.002	7.08E-03	2.73E-01	6.56E-01	1.00
Ethyl-tert-butyl-ether (ETBE)	637-92-3	NA	NA	NA	1.0E-03	8.6E-02	1.0E-03	N/A	1.0	0.006	2.44E-02	3.92E-01	9.40E-01	1.00
Diisopropyl ether (DIPE)	108-20-3	NA	NA	NA	1.0E-01	1.1E-01	1.0E-01	N/A	1.0	0.009	3.51E-02	3.92E-01	9.40E-01	1.00
Ethanol	64-17-5	NA	NA	NA	3.3E+01	5.4E-01	3.3E+01	N/A	1.0	0.001	1.40E-03	1.93E-01	4.63E-01	1.00
Methanol	67-56-1	NA	NA	NA	5.0E-01	1.1E+00	5.0E-01	N/A	1.0	0.000	6.94E-04	1.61E-01	3.86E-01	1.00
Arsenic	7440-38-2	1.5E+00	1.5E+01	1.5E+00	3.0E-04	8.6E-06	3.0E-04	0.03	1.0	0.001	NA	NA	NA	NA
Barium	7440-39-3	NA	NA	NA	2.0E-01	1.4E-04	2.0E-01	0.01	1.0	0.001	NA	NA	NA	NA
Cadmium	7440-43-9	3.8E-01	6.3E+00	3.8E-01	1.0E-03	NA	1.0E-03	0.001	1.0	0.001	NA	NA	NA	NA
Chromium (III) total chromium	7440-47-3	NA	NA	NA	1.5E+00	2.9E-05	1.5E+00	0.01	1.0	0.001	NA	NA	NA	NA
Chromium (VI)	18540-29-9	4.2E+01	4.2E+01	4.2E+01	3.0E-03	2.3E-06	3.0E-03	0.01	1.0	0.002	NA	NA	NA	NA
Lead	7439-92-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	NA	NA	NA	5.0E-03	5.7E-05	5.0E-03	0.01	1.0	0.001	NA	NA	NA	NA

Notes:
NA: Not available
N/A: Not applicable

Table B-2
Physical and Chemical Properties of Chemicals of Concer

Chemicals of Concern	CAS #	Molecular Weight, MW (g/mol)	Water Solubility, S (mg/L)	Henry's Law Constant, H (L-water/L-air)	Organic Carbon Adsorption Coefficient, K_{oc} (cm^3/g)	Soil-Water Partition Coefficient, K_d (L/kg)	Diffusion Coefficient in Air, D_a (cm^2/s)	Diffusion Coefficient in Water, D_w (cm^2/s)	Vapor Pressure, P (mmHg)	Octanol-Water Partition Coefficient, K_{ow} (cm^3/g)
Benzene	71-43-2	78.11	1.75E+03	2.28E-01	5.89E+01	NA	8.80E-02	9.80E-06	9.50E+01	9.77E+01
Toluene	108-88-3	92.14	5.26E+02	2.72E-01	1.82E+02	NA	8.70E-02	8.60E-06	2.82E+01	3.47E+02
Ethylbenzene	100-41-4	106.17	1.69E+02	3.23E-01	3.63E+02	NA	7.50E-02	7.80E-06	9.60E+00	1.07E+03
Xylenes (total)	1330-20-7	106.17	1.61E+02	3.01E-01	4.07E+02	NA	7.00E-02	7.80E-06	8.06E+00	1.23E+03
Ethylene dibromide (EDB)	106-93-4	188	4.32E+03	2.93E-02	5.37E+01	NA	2.17E-02	1.90E-05	1.10E+01	1.02E+02
Ethylene dichloride (EDC)	107-06-2	98.96	8.52E+03	4.01E-02	1.74E+01	NA	1.04E-01	9.90E-06	8.13E+01	6.76E+01
Methyl tertiary butyl ether (MTBE)	1634-04-4	88.15	5.10E+04	2.41E-02	1.12E+01	NA	8.00E-02	1.00E-05	2.49E+02	7.59E+01
Acenaphthene	83-32-9	154.21	4.24E+00	6.36E-03	7.08E+03	NA	4.21E-02	7.69E-06	3.75E-03	1.41E+04
Anthracene	120-12-7	178.24	4.34E-02	2.95E-02	2.95E+04	NA	3.24E-02	7.74E-06	2.55E-05	2.24E+04
Benzo(a)anthracene	56-55-3	228.3	9.40E-03	1.37E-04	3.98E+05	NA	5.10E-02	9.00E-06	1.54E-07	3.31E+05
Benzo(a)pyrene	50-32-8	252.32	1.62E-03	4.63E-05	1.02E+06	NA	4.30E-02	9.00E-06	4.89E-09	1.29E+06
Benzo(b)fluoranthene	205-99-2	252.32	1.50E-03	4.55E-03	1.23E+06	NA	2.26E-02	5.56E-06	8.06E-08	1.29E+06
Benzo(k)fluoranthene	207-08-9	252.32	8.00E-04	3.40E-05	1.23E+06	NA	2.26E-02	5.56E-06	9.59E-11	1.29E+06
Chrysene	218-01-9	228.3	1.60E-03	3.88E-03	3.98E+05	NA	2.48E-02	6.21E-06	7.80E-09	3.31E+05
Dibenzo(a,h)anthracene	53-70-3	278.4	2.49E-03	6.03E-07	3.80E+06	NA	2.02E-02	5.18E-06	2.10E-11	5.01E+06
Fluoranthene	206-44-0	202.26	2.06E-01	6.60E-04	1.07E+05	NA	3.02E-02	6.35E-06	8.13E-06	8.51E+04
Fluorene	86-73-7	166.22	1.98E+00	2.61E-03	1.38E+04	NA	3.63E-02	7.88E-06	3.24E-03	1.05E+04
Naphthalene	91-20-3	128.18	3.10E+01	1.98E-02	2.00E+03	NA	5.90E-02	7.50E-06	8.89E-02	1.48E+03
Pyrene	129-00-0	202.26	1.35E-01	4.51E-04	1.05E+05	NA	2.72E-02	7.24E-06	4.25E-06	8.51E+04
TPH-GRO										
TPH-DRO										
TPH-ORO										
Aliphatics - > C6-C8	NA	100	5.40E+00	5.00E+01	3.98E+03	NA	1.00E-01	1.00E-05	4.79E+01	NA
Aliphatics - > C8-C10	NA	130	4.30E-01	8.00E+01	3.16E+04	NA	1.00E-01	1.00E-05	4.79E+00	NA
Aliphatics - >C10-C12	NA	160	3.40E-02	1.20E+02	2.51E+05	NA	1.00E-01	1.00E-05	4.79E-01	NA
Aliphatics - >C12-C16	NA	200	7.60E-04	5.20E+02	5.01E+06	NA	1.00E-01	1.00E-05	3.65E-02	NA
Aliphatics - >C16-C21	NA	270	2.50E-06	4.90E+03	6.31E+08	NA	1.00E-01	1.00E-05	8.40E-04	NA
Aliphatics - >C21-C35	NA	270	2.50E-06	4.90E+03	6.31E+08	NA	1.00E-01	1.00E-05	8.40E-04	NA
Aromatics - >C8-C10	NA	120	6.50E+01	4.80E-01	1.58E+03	NA	1.00E-01	1.00E-05	4.79E+00	NA
Aromatics - >C10-C12	NA	130	2.50E+01	1.40E-01	2.51E+03	NA	1.00E-01	1.00E-05	4.79E-01	NA
Aromatics - >C12-C16	NA	150	5.80E+00	5.30E-02	5.01E+03	NA	1.00E-01	1.00E-05	3.65E-02	NA
Aromatics - >C16-C21	NA	190	6.50E-01	1.30E-02	1.58E+04	NA	1.00E-01	1.00E-05	8.36E-04	NA
Aromatics - >C21-C35	NA	240	6.60E-03	6.70E-04	1.26E+05	NA	1.00E-01	1.00E-05	3.34E-07	NA
Tertiary-amyl-methyl-ether (TAME)	994-05-8	102	4.29E+03	1.30E-01	4.17E+01	NA	6.99E-02	7.37E-06	9.97E+01	8.91E+01
Tertiary-butyl-alcohol (TBA)	75-65-0	74.1	2.35E+05	5.42E-04	4.22E+00	NA	8.52E-02	9.11E-06	3.14E+01	4.90E+00
Ethyl-tert-butyl-ether (ETBE)	637-92-3	102	5.03E+03	9.99E-02	3.72E+01	NA	6.95E-02	7.34E-06	9.00E+01	7.59E+01
Diisopropyl ether (DIPE)	108-20-3	102	2.67E+03	1.63E-01	6.46E+01	NA	6.81E-02	7.15E-06	7.76E+01	1.55E+02
Ethanol	64-17-5	46.1	2.96E+05	2.77E-04	1.19E+00	NA	1.15E-01	1.22E-05	7.76E+01	9.95E-01
Methanol	67-56-1	32.04	1.00E+06	1.87E-04	9.00E+00	NA	1.50E-01	1.64E-05	1.22E+02	2.33E-01
Arsenic	7440-38-2	74.9	NA	NA	NA	2.90E+01	NA	NA	NA	4.78E+00
Barium	7440-39-3	137	NA	NA	NA	4.10E+01	NA	NA	NA	NA
Cadmium	7440-43-9	112.4	NA	NA	NA	7.50E+01	NA	NA	NA	8.49E-01
Chromium (III) total chromium	7440-47-3	52	NA	NA	NA	1.80E+06	NA	NA	NA	NA
Chromium (VI)	18540-29-9	52	NA	NA	NA	1.90E+01	NA	NA	NA	NA
Lead	7439-92-1	207	NA	NA	NA	1.00E+01	NA	NA	NA	5.36E+00
Selenium	7782-49-2	78.96	NA	NA	NA	5.00E+00	NA	NA	NA	1.73E+00

Notes:
NA: Not available

Table B-3
Exposure Factors

Parameter	Symbol	Unit	Default
Averaging Time for Carcinogen	AT_c	year	70
Averaging Time for Non-Carcinogen	AT_{nc}	year	=ED
Body Weight:			
Resident Child	BW	kg	15
Resident Adult	BW	kg	70
Non-Residential Worker	BW	kg	70
Construction Worker	BW	kg	70
Exposure Duration:			
Resident Child	ED	year	6
Resident Adult	ED	year	24
Non-Residential Worker	ED	year	25
Construction Worker	ED	year	1
Exposure Frequency:			
Resident Child	EF	day/year	350
Resident Adult	EF	day/year	350
Non-Residential Worker	EF	day/year	250
Construction Worker	EF	day/year	90
Soil Ingestion Rate:			
Resident Child	IR_{soil}	mg/day	200
Resident Adult	IR_{soil}	mg/day	100
Non-Residential Worker	IR_{soil}	mg/day	100
Construction Worker	IR_{soil}	mg/day	100
Groundwater Ingestion Rate:			
Resident Child	IR^w	L/day	1
Resident Adult	IR^w	L/day	2
Indoor Inhalation Rate (hourly):			
Resident Child	IRai	m^3/hr	0.416
Resident Adult	IRai	m^3/hr	0.833
Non-Residential Worker	IRai	m^3/hr	0.833
Exposure Time for Indoor Inhalation:			
Resident Child	ET_{in}	hr/day	18
Resident Adult	ET_{in}	hr/day	18
Non-Residential Worker	ET_{in}	hr/day	18
Indoor Inhalation Rate (daily)*:			
Resident Child	IR_a	m^3/day	7.5
Resident Adult	IR_a	m^3/day	15.0
Non-Residential Worker	IR_a	m^3/day	15.0
Outdoor Inhalation Rate (hourly):			
Resident Child	IR_{ao}	m^3/hr	0.416
Resident Adult	IR_{ao}	m^3/hr	0.833
Non-Residential Worker	IR_{ao}	m^3/hr	0.833
Construction Worker	IR_{ao}	m^3/hr	1.62

Table B-3
Exposure Factors

Parameter	Symbol	Unit	Default
Exposure Time for Outdoor Inhalation:			
Resident Child	ET_{out}	hr/day	6
Resident Adult	ET_{out}	hr/day	6
Non-Residential Worker	ET_{out}	hr/day	6
Construction Worker	ET_{out}	hr/day	10
Outdoor Inhalation Rate (daily):**			
Resident Child	IR_a	m^3/day	2.5
Resident Adult	IR_a	m^3/day	5.0
Non-Residential Worker	IR_a	m^3/day	5.0
Construction Worker	IR_a	m^3/day	16.2
Skin Surface Area for Incidental Dermal Contact with Soil:			
Resident Child	SA_{soil}	cm^2/day	2800
Resident Adult	SA_{soil}	cm^2/day	5700
Non-Residential Worker	SA_{soil}	cm^2/day	3300
Construction Worker	SA_{soil}	cm^2/day	3300
Skin Surface Area for Incidental Dermal Contact with Water:			
Resident Child	SA_{gw}	cm^2/day	2800
Resident Adult	SA_{gw}	cm^2/day	5700
Non-Residential Worker	SA_{gw}	cm^2/day	3300
Construction Worker	SA_{gw}	cm^2/day	3300
Skin Surface Area for Whole-Body Dermal Contact with Water:			
Resident Child	$SA_{gw\text{-}wb}$	cm^2/day	6600
Resident Adult	$SA_{gw\text{-}wb}$	cm^2/day	18000
Soil to Skin Adherence Factor:			
Resident Child	AF	mg/cm^2	0.2
Resident Adult	AF	mg/cm^2	0.07
Non-Residential Worker	AF	mg/cm^2	0.2
Construction Worker	AF	mg/cm^2	0.3
Event Frequency for Incidental Dermal Contact with Soil			
Resident Child	EV_{soil}	event/day	1
Resident Adult	EV_{soil}	event/day	1
Non-Residential Worker	EV_{soil}	event/day	1
Construction Worker	EV_{soil}	event/day	1
Event Frequency for Incidental Dermal Contact with Water			
Resident Child	EV_{gw}	event/day	1
Resident Adult	EV_{gw}	event/day	1
Non-Residential Worker	EV_{gw}	event/day	1
Construction Worker	EV_{gw}	event/day	1
Event Frequency for Whole-Body Dermal Contact with Water			
Resident Child	EV_{gw_wb}	event/day	1
Resident Adult	EV_{gw_wb}	event/day	1

Table B-3
Exposure Factors

Parameter	Symbol	Unit	Default
Event Duration for Incidental Dermal Contact with Water			
Resident Child	t_{event}	hr/event	1
Resident Adult	t_{event}	hr/event	1
Non-Residential Worker	t_{event}	hr/event	1
Construction Worker	t_{event}	hr/event	1
Event Duration for Whole-Body Dermal Contact with Water			
Resident Child	t_{event_wb}	hr/event	0.33
Resident Adult	t_{event_wb}	hr/event	0.25

Notes:
*: Calculated as hourly indoor inhalation rate times exposure time for indoor inhalatio
**: Calculated as hourly outdoor inhalation rate times exposure time for outdoor inhalation

Table B-4
Fate and Transport Parameters

Parameter	Symbol	Unit	Default Value	~~Soil Type 2~~	~~Soil Type 3~~
SOIL PARAMETERS:					
Soil Source Dimension Parallel to Wind Direction	W_a	cm	1500	~~1500~~	~~1500~~
Depth to Subsurface Soil Sources	d_{ts}	cm	91.44	~~91.44~~	~~91.44~~
Depth of Surficial Soil Zone	d_s	cm	91.44	~~91.44~~	~~91.44~~
Depth to Soil Vapor Measurement	dsv	cm	91.44	~~91.44~~	~~91.44~~
VADOSE ZONE:					
Total Soil Porosity	θ_T	cm^3/cm^3-soil	0.38	~~0.44~~	~~0.44~~
Volumetric Water Content	θ_{ws}	cm^3/cm^3	0.08	~~0.17~~	~~0.21~~
Volumetric Air Content	θ_{as}	cm^3/cm^3	**0.30**	~~**0.27**~~	~~**0.23**~~
Thickness	h_v	cm	**295**	~~**295**~~	~~**295**~~
Dry Soil Bulk Density	ρ_s	g/cm^3	1.5	~~1.5~~	~~1.5~~
Fractional Organic Carbon Content	f_{ocv}	g-C/g-soil	0.006	~~0.006~~	~~0.006~~
SOIL IN CRACKS:					
Total Soil Porosity	θ_{Tcrack}	cm^3/cm^3-soil	0.38	~~0.44~~	~~0.44~~
Volumetric Water Content	θ_{wcrack}	cm^3/cm^3	0.08	~~0.17~~	~~0.21~~
Volumetric Air Content	θ_{acrack}	cm^3/cm^3	**0.30**	~~**0.27**~~	~~**0.23**~~
CAPILLARY FRINGE:					
Total Soil Porosity	θ_{Tcap}	cm^3/cm^3-soil	0.38	~~0.44~~	~~0.44~~
Volumetric Water Content	θ_{wcap}	cm^3/cm^3	**0.34**	~~**0.40**~~	~~**0.40**~~
Volumetric Air Content	θ_{acap}	cm^3/cm^3	**0.038**	~~**0.044**~~	~~**0.044**~~
Thickness	h_c	cm	5	~~5~~	~~5~~
GROUNDWATER PARAMETERS:					
Depth to Groundwater	L_{gw}	cm	300	~~300~~	~~300~~
GW Source Dimension Perpendicular to GW Flow Direction	Y	cm	1500	~~1500~~	~~1500~~
GW Source Dimension Parallel to GW Flow Direction	W_{ga}	cm	1500	~~1500~~	~~1500~~
Total Porosity in the Saturated Zone*	θ_{TS}	cm^3/cm^3	0.38	~~0.44~~	~~0.44~~
Dry Soil Bulk Density (Saturated Zone)*	ρ_{ss}	g/cm^3	1.5	~~1.5~~	~~1.5~~
Fractional Organic Carbon Content in the Saturated Zone*	f_{ocs}	g-C/g-soil	0.006	~~0.006~~	~~0.006~~
Groundwater Mixing Zone Thickness	δ_{gw}	cm	200	~~200~~	~~200~~
Hydraulic Conductivity in the Saturated Zone	K	cm/year	625000	~~625000~~	~~625000~~
Hydraulic Gradient in the Saturated Zone	i	cm/cm	0.004	~~0.004~~	~~0.004~~
Groundwater Darcy Velocity	U_{gw}	cm/year	**2500**	~~**2500**~~	~~**2500**~~
Infiltration Rate of Water Through Vadose Zone	I	cm/year	14	~~14~~	~~14~~
AMBIENT AIR PARAMETERS:					
Breathing Zone Height	δ_a	cm	200	~~200~~	~~200~~
Inverse of Mean Concentration at Center of Square Source	Q/C	g/m^2-s)/(kg/m^3	81.64	~~81.64~~	~~81.64~~
Fraction of Vegetative Cover	V	m^2/m^2	0.5	~~0.5~~	~~0.5~~
Mean Annual Wind Speed	U_m	m/s	4.69	~~4.69~~	~~4.69~~
Equivalent Threshold Value of Windspeed	U_t	m/s	11.32	~~11.32~~	~~11.32~~
Windspeed Distribution Function from Cowherd et. al, 1985	F(x)	unitless	0.194	~~0.194~~	~~0.194~~

Table B-4
Fate and Transport Parameters

Parameter	Symbol	Unit	Default Value	~~Soil Type 2~~	~~Soil Type 3~~
ENCLOSED SPACE PARAMETERS:					
Enclosed Space Air Exchange Rate:					
Residential Structure	ER	1/24 hrs	12.096	~~12.096~~	~~12.096~~
Non-Residential Structure	ER	1/24hrs	19.872	~~19.872~~	~~19.872~~
Enclosed Space Volume/Infiltration Area:					
Residential Structure	L_B	cm	200	~~200~~	~~200~~
Non-Residential Structure	L_B	cm	300	~~300~~	~~300~~
Volatalization Factor for Domestic Water Use (K)	K	L/m^3	0.5	~~0.5~~	~~0.5~~
Enclosed Space Foundation or Wall Thickness:					
Residential Structure	L_{crack}	cm	15	~~15~~	~~15~~
Non-Residential Structure	L_{crack}	cm	15	~~15~~	~~15~~
Area Fraction of Cracks in Foundation/Walls:					
Residential Structure	η	cm^2/cm^2	0.001	~~0.001~~	~~0.001~~
Non-Residential Structure	η	cm^2/cm^2	0.001	~~0.001~~	~~0.001~~

Notes:
The values in **bold** are calculated .
* These parameters not used for DTL or Tier 1 RBTL caculations, but may be required for Tier 2 SSTLs.

Table B-5
Effective/Saturated Soil, Solubility/Effective Solubility, and Saturated Vapor Concentrations

Chemicals of Concern	CAS #	Saturated Soil Concentrations (mg/kg)			Effective/Saturated Soil Concentrations for			Effective/Saturated Soil Concentrations for Diesel		
		Default	~~Soil Type 2 (Silty)~~	~~Soil Type 3 (Clayey)~~	Default	~~Soil Type 2 (Silty)~~	~~Soil Type 3 (Clayey)~~	Default	~~Soil Type 2 (Silty)~~	~~Soil Type 3 (Clayey)~~
Benzene	71-43-2	7.92E+02	~~8.89E+02~~	~~9.25E+02~~	2.02E+01	~~2.27E+01~~	~~2.36E+01~~	6.76E-01	~~7.59E-01~~	~~7.90E-01~~
Toluene	108-88-3	6.31E+02	~~6.60E+02~~	~~6.70E+02~~	5.83E+01	~~6.09E+01~~	~~6.18E+01~~	2.84E+00	~~2.96E+00~~	~~3.01E+00~~
Ethylbenzene	100-41-4	3.88E+02	~~3.97E+02~~	~~4.00E+02~~	6.52E+00	~~6.68E+00~~	~~6.73E+00~~	5.72E-01	~~5.85E-01~~	~~5.89E-01~~
Xylenes (total)	1330-20-7	4.11E+02	~~4.20E+02~~	~~4.23E+02~~	3.66E+01	~~3.74E+01~~	~~3.77E+01~~	4.46E+00	~~4.55E+00~~	~~4.58E+00~~
Ethylene dibromide (EDB)	106-93-4	1.65E+03	~~1.90E+03~~	~~2.02E+03~~	1.65E+03	~~1.90E+03~~	~~2.02E+03~~	1.65E+03	~~1.90E+03~~	~~2.02E+03~~
Ethylene dichloride (EDC)	107-06-2	1.41E+03	~~1.92E+03~~	~~2.13E+03~~	1.41E+03	~~1.92E+03~~	~~2.13E+03~~	1.41E+03	~~1.92E+03~~	~~2.13E+03~~
Methyl tertiary butyl ether (MTBE)	1634-04-4	6.39E+03	~~9.43E+03~~	~~1.08E+04~~	6.39E+03	~~9.43E+03~~	~~1.08E+04~~	6.39E+03	~~9.43E+03~~	~~1.08E+04~~
Acenaphthene	83-32-9	1.80E+02	~~1.81E+02~~	~~1.81E+02~~	1.80E+02	~~1.81E+02~~	~~1.81E+02~~	1.80E+02	~~1.81E+02~~	~~1.81E+02~~
Anthracene	120-12-7	7.68E+00	~~7.69E+00~~	~~7.69E+00~~	7.68E+00	~~7.69E+00~~	~~7.69E+00~~	5.75E-04	~~5.75E-04~~	~~5.75E-04~~
Benzo(a)anthracene	56-55-3	2.24E+01	~~2.24E+01~~	~~2.24E+01~~	2.24E+01	~~2.24E+01~~	~~2.24E+01~~	2.17E-05	~~2.17E-05~~	~~2.17E-05~~
Benzo(a)pyrene	50-32-8	9.91E+00	~~9.91E+00~~	~~9.91E+00~~	9.91E+00	~~9.91E+00~~	~~9.91E+00~~	1.99E-05	~~1.99E-05~~	~~1.99E-05~~
Benzo(b)fluoranthene	205-99-2	1.11E+01	~~1.11E+01~~	~~1.11E+01~~	1.11E+01	~~1.11E+01~~	~~1.11E+01~~	1.56E-05	~~1.56E-05~~	~~1.56E-05~~
Benzo(k)fluoranthene	207-08-9	5.91E+00	~~5.91E+00~~	~~5.91E+00~~	5.91E+00	~~5.91E+00~~	~~5.91E+00~~	8.34E-06	~~8.34E-06~~	~~8.34E-06~~
Chrysene	218-01-9	3.82E+00	~~3.82E+00~~	~~3.82E+00~~	3.82E+00	~~3.82E+00~~	~~3.82E+00~~	1.73E-06	~~1.73E-06~~	~~1.73E-06~~
Dibenzo(a,h)anthracene	53-70-3	5.68E+01	~~5.68E+01~~	~~5.68E+01~~	5.68E+01	~~5.68E+01~~	~~5.68E+01~~	5.68E+01	~~5.68E+01~~	~~5.68E+01~~
Fluoranthene	206-44-0	1.32E+02	~~1.32E+02~~	~~1.32E+02~~	1.32E+02	~~1.32E+02~~	~~1.32E+02~~	8.87E-03	~~8.87E-03~~	~~8.87E-03~~
Fluorene	86-73-7	1.64E+02	~~1.64E+02~~	~~1.64E+02~~	1.64E+02	~~1.64E+02~~	~~1.64E+02~~	1.95E-01	~~1.95E-01~~	~~1.95E-01~~
Naphthalene	91-20-3	3.74E+02	~~3.76E+02~~	~~3.76E+02~~	7.65E-01	~~7.69E-01~~	~~7.71E-01~~	1.74E+00	~~1.75E+00~~	~~1.76E+00~~
Pyrene	129-00-0	8.51E+01	~~8.51E+01~~	~~8.51E+01~~	8.51E+01	~~8.51E+01~~	~~8.51E+01~~	4.45E-03	~~4.45E-03~~	~~4.45E-03~~
TPH-GRO	NA	8.98E+02	~~8.95E+02~~	~~8.88E+02~~	8.98E+02	~~8.95E+02~~	~~8.88E+02~~	8.98E+02	~~8.95E+02~~	~~8.88E+02~~
TPH-DRO	NA	7.00E+02	~~7.02E+02~~	~~7.02E+02~~	7.00E+02	~~7.02E+02~~	~~7.02E+02~~	7.00E+02	~~7.02E+02~~	~~7.02E+02~~
TPH-ORO	NA	1.44E+01	~~1.44E+01~~	~~1.44E+01~~	1.44E+01	~~1.44E+01~~	~~1.44E+01~~	1.44E+01	~~1.44E+01~~	~~1.44E+01~~
Aliphatics - > C6-C8	NA	1.83E+02	~~1.78E+02~~	~~1.71E+02~~	1.83E+02	~~1.78E+02~~	~~1.71E+02~~	1.83E+02	~~1.78E+02~~	~~1.71E+02~~
Aliphatics - > C8-C10	NA	8.84E+01	~~8.78E+01~~	~~8.69E+01~~	8.84E+01	~~8.78E+01~~	~~8.69E+01~~	8.84E+01	~~8.78E+01~~	~~8.69E+01~~
Aliphatics - >C10-C12	NA	5.20E+01	~~5.20E+01~~	~~5.19E+01~~	5.20E+01	~~5.20E+01~~	~~5.19E+01~~	5.20E+01	~~5.20E+01~~	~~5.19E+01~~
Aliphatics - >C12-C16	NA	2.29E+01	~~2.29E+01~~	~~2.29E+01~~	2.29E+01	~~2.29E+01~~	~~2.29E+01~~	2.29E+01	~~2.29E+01~~	~~2.29E+01~~
Aliphatics - >C16-C21	NA	9.47E+00	~~9.47E+00~~	~~9.47E+00~~	9.47E+00	~~9.47E+00~~	~~9.47E+00~~	9.47E+00	~~9.47E+00~~	~~9.47E+00~~
Aliphatics - >C21-C35	NA	9.47E+00	~~9.47E+00~~	~~9.47E+00~~	9.47E+00	~~9.47E+00~~	~~9.47E+00~~	9.47E+00	~~9.47E+00~~	~~9.47E+00~~
Aromatics - >C8-C10	NA	6.26E+02	~~6.29E+02~~	~~6.30E+02~~	6.26E+02	~~6.29E+02~~	~~6.30E+02~~	6.26E+02	~~6.29E+02~~	~~6.30E+02~~
Aromatics - >C10-C12	NA	3.79E+02	~~3.80E+02~~	~~3.81E+02~~	3.79E+02	~~3.80E+02~~	~~3.81E+02~~	3.79E+02	~~3.80E+02~~	~~3.81E+02~~
Aromatics - >C12-C16	NA	1.75E+02	~~1.75E+02~~	~~1.75E+02~~	1.75E+02	~~1.75E+02~~	~~1.75E+02~~	1.75E+02	~~1.75E+02~~	~~1.75E+02~~
Aromatics - >C16-C21	NA	6.18E+01	~~6.19E+01~~	~~6.19E+01~~	6.18E+01	~~6.19E+01~~	~~6.19E+01~~	6.18E+01	~~6.19E+01~~	~~6.19E+01~~
Aromatics - >C21-C35	NA	4.98E+00	~~4.98E+00~~	~~4.98E+00~~	4.98E+00	~~4.98E+00~~	~~4.98E+00~~	4.98E+00	~~4.98E+00~~	~~4.98E+00~~
Tertiary-amyl-methyl-ether (TAME)	994-05-8	1.41E+03	~~1.66E+03~~	~~1.76E+03~~	1.41E+03	~~1.66E+03~~	~~1.76E+03~~	1.41E+03	~~1.66E+03~~	~~1.76E+03~~
Tertiary-butyl-alcohol (TBA)	75-65-0	1.85E+04	~~3.26E+04~~	~~3.89E+04~~	1.85E+04	~~3.26E+04~~	~~3.89E+04~~	1.85E+04	~~3.26E+04~~	~~3.89E+04~~
Ethyl-tert-butyl-ether (ETBE)	637-92-3	1.49E+03	~~1.78E+03~~	~~1.90E+03~~	1.49E+03	~~1.78E+03~~	~~1.90E+03~~	1.49E+03	~~1.78E+03~~	~~1.90E+03~~
Diisopropyl ether (DIPE)	108-20-3	1.26E+03	~~1.42E+03~~	~~1.48E+03~~	1.26E+03	~~1.42E+03~~	~~1.48E+03~~	1.26E+03	~~1.42E+03~~	~~1.48E+03~~
Ethanol	64-17-5	1.79E+04	~~3.57E+04~~	~~4.36E+04~~	1.79E+04	~~3.57E+04~~	~~4.36E+04~~	1.79E+04	~~3.57E+04~~	~~4.36E+04~~
Methanol	67-56-1	1.07E+05	~~1.67E+05~~	~~1.94E+05~~	1.07E+05	~~1.67E+05~~	~~1.94E+05~~	1.07E+05	~~1.67E+05~~	~~1.94E+05~~
Arsenic	7440-38-2	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Barium	7440-39-3	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Cadmium	7440-43-9	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Chromium (III) total chromium	7440-47-3	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Chromium (VI)	18540-29-9	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Lead	7439-92-1	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~
Selenium	7782-49-2	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~	NA	~~NA~~	~~NA~~

Notes:
NA: Not available
When weight percent is not available, saturated soil concentration, solubility,

Table B-5
Effective/Saturated Soil, Solubility/Effective Solubility, and Saturated Vapor Concentrations

Chemicals of Concern	CAS #	Effective/Solubility (mg/L)					Effective/Saturated Vapor	
		Gasoline	Diesel	Jet Fuel (JP-4 & JP-5)	Kerosene	Fuel Oil No. 6	Gasoline	Diesel
Benzene	71-43-2	4.47E+01	1.49E+00	1.74E+01	1.75E+03	1.75E+03	1.02E+04	3.41E+02
Toluene	108-88-3	4.86E+01	2.36E+00	1.51E+01	5.26E+02	5.26E+02	1.29E+04	6.28E+02
Ethylbenzene	100-41-4	2.84E+00	2.49E-01	1.73E+00	1.69E+02	1.69E+02	9.22E+02	8.08E+01
Xylenes (total)	1330-20-7	1.43E+01	1.74E+00	3.60E+00	1.61E+02	1.61E+02	4.10E+03	4.99E+02
Ethylene dibromide (EDB)	106-93-4	4.32E+03	4.32E+03	4.32E+03	4.32E+03	4.32E+03	1.11E+05	1.11E+05
Ethylene dichloride (EDC)	107-06-2	8.52E+03	8.52E+03	8.52E+03	8.52E+03	8.52E+03	4.33E+05	4.33E+05
Methyl tertiary butyl ether (MTBE)	1634-04-4	5.10E+04	5.10E+04	5.10E+04	5.10E+04	5.10E+04	1.18E+06	1.18E+06
Acenaphthene	83-32-9	4.24E+00	4.24E+00	4.24E+00	1.36E-04	4.24E+00	3.11E+01	3.11E+01
Anthracene	120-12-7	4.34E-02	3.25E-06	4.34E-02	3.07E-08	2.80E-06	2.45E-01	1.83E-05
Benzo(a)anthracene	56-55-3	9.40E-03	9.09E-09	9.40E-03	9.40E-03	5.21E-06	1.89E-03	1.83E-09
Benzo(a)pyrene	50-32-8	1.62E-03	3.25E-09	1.62E-03	1.62E-03	6.50E-08	6.64E-05	1.33E-10
Benzo(b)fluoranthene	205-99-2	1.50E-03	2.12E-09	1.50E-03	1.50E-03	3.01E-07	1.09E-03	1.55E-09
Benzo(k)fluoranthene	207-08-9	8.00E-04	1.13E-09	8.00E-04	8.00E-04	1.60E-07	1.30E-06	1.84E-12
Chrysene	218-01-9	1.60E-03	7.25E-10	1.60E-03	1.60E-03	1.11E-06	9.58E-05	4.34E-11
Dibenzo(a,h)anthracene	53-70-3	2.49E-03	2.49E-03	2.49E-03	2.49E-03	2.49E-03	3.15E-07	3.15E-07
Fluoranthene	206-44-0	2.06E-01	1.38E-05	2.06E-01	9.20E-07	5.62E-05	8.85E-02	5.94E-06
Fluorene	86-73-7	1.98E+00	2.36E-03	1.98E+00	1.98E+00	1.98E+00	2.90E+01	3.45E-02
Naphthalene	91-20-3	6.35E-02	1.45E-01	1.64E-01	7.87E-02	2.34E-03	1.26E+00	2.86E+00
Pyrene	129-00-0	1.35E-01	7.06E-06	1.35E-01	1.68E-07	3.53E-06	4.63E-02	2.42E-06
TPH-GRO	NA	7.08E+01	7.08E+01	7.08E+01	7.08E+01	7.08E+01	3.22E+05	3.22E+05
TPH-DRO	NA	3.15E+01	3.15E+01	3.15E+01	3.15E+01	3.15E+01	8.18E+03	8.18E+03
TPH-ORO	NA	6.60E-03	6.60E-03	6.60E-03	6.60E-03	6.60E-03	1.22E+01	1.22E+01
Aliphatics - > C6-C8	NA	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	2.58E+05	2.58E+05
Aliphatics - > C8-C10	NA	4.30E-01	4.30E-01	4.30E-01	4.30E-01	4.30E-01	3.35E+04	3.35E+04
Aliphatics - >C10-C12	NA	3.40E-02	3.40E-02	3.40E-02	3.40E-02	3.40E-02	4.12E+03	4.12E+03
Aliphatics - >C12-C16	NA	7.60E-04	7.60E-04	7.60E-04	7.60E-04	7.60E-04	3.93E+02	3.93E+02
Aliphatics - >C16-C21	NA	2.50E-06	2.50E-06	2.50E-06	2.50E-06	2.50E-06	1.22E+01	1.22E+01
Aliphatics - >C21-C35	NA	2.50E-06	2.50E-06	2.50E-06	2.50E-06	2.50E-06	1.22E+01	1.22E+01
Aromatics - >C8-C10	NA	6.50E+01	6.50E+01	6.50E+01	6.50E+01	6.50E+01	3.09E+04	3.09E+04
Aromatics - >C10-C12	NA	2.50E+01	2.50E+01	2.50E+01	2.50E+01	2.50E+01	3.35E+03	3.35E+03
Aromatics - >C12-C16	NA	5.80E+00	5.80E+00	5.80E+00	5.80E+00	5.80E+00	2.95E+02	2.95E+02
Aromatics - >C16-C21	NA	6.50E-01	6.50E-01	6.50E-01	6.50E-01	6.50E-01	8.55E+00	8.55E+00
Aromatics - >C21-C35	NA	6.60E-03	6.60E-03	6.60E-03	6.60E-03	6.60E-03	4.31E-03	4.31E-03
Tertiary-amyl-methyl-ether (TAME)	994-05-8	4.29E+03	4.29E+03	4.29E+03	4.29E+03	4.29E+03	5.47E+05	5.47E+05
Tertiary-butyl-alcohol (TBA)	75-65-0	2.35E+05	2.35E+05	2.35E+05	2.35E+05	2.35E+05	1.25E+05	1.25E+05
Ethyl-tert-butyl-ether (ETBE)	637-92-3	5.03E+03	5.03E+03	5.03E+03	5.03E+03	5.03E+03	4.94E+05	4.94E+05
Diisopropyl ether (DIPE)	108-20-3	2.67E+03	2.67E+03	2.67E+03	2.67E+03	2.67E+03	4.26E+05	4.26E+05
Ethanol	64-17-5	2.96E+05	2.96E+05	2.96E+05	2.96E+05	2.96E+05	1.92E+05	1.92E+05
Methanol	67-56-1	1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06	2.10E+05	2.10E+05
Arsenic	7440-38-2	NA	NA	NA	NA	NA	NA	NA
Barium	7440-39-3	NA	NA	NA	NA	NA	NA	NA
Cadmium	7440-43-9	NA	NA	NA	NA	NA	NA	NA
Chromium (III) total chromium	7440-47-3	NA	NA	NA	NA	NA	NA	NA
Chromium (VI)	18540-29-9	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	NA	NA	NA	NA	NA	NA	NA
Selenium	7782-49-2	NA	NA	NA	NA	NA	NA	NA

Notes:
NA: Not available
When weight percent is not available, saturated soil concentration, solubility,