

Model Chemical/Watershed Data

## 1.0 MODEL CHEMICAL/WATERSHED DATA

## 1.1 Chemical Data

The chemical data that were used in the spreadsheet model are presented for each COPC in Tables D.1 through D.69. Rationale and references for the selection of each value is contained within the tables.

## 1.2 Watershed Data

The watershed data that were used in the spreadsheet model are presented for each watershed in Tables D.70 through D.83. Rationale and references used in the selection of each value is included in the tables.

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	6.50E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.55	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+04	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.998	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	53.3	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	53.3	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0971	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0971	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0971	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0971	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	4500	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1762.5	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	940	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	678	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	158.49	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	3.40E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.37	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	5.01E+05	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.483	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	19338	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	19338	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	60000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	26850	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	14320	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	5689	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	9.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.051	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.51E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.66E-05	EpiSuite
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	3.37	Mackay et al., 2000, HHRAP A2-2.11, EpiSuite
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.51E+05	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.992	Assumed (Fluoranthene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1184.61	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1184.61	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.03	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.03	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.03	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.03	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	990.83	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	7431.24	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3963.33	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	3342.39	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.11E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.26E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.48	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.294	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	124742	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	124742	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0132	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0132	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0132	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0132	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	160000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	72675	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	38760	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	9684	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	9.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.043	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.11E-04	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.33E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.966	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1675	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1675	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0112	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0112	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0112	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0112	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1.05E+04	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	7.86E+04	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4.19E+04	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	12065	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	6.67E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.63E-05	EpiSuite
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	3.3726	Mackay et al., 2000, HHRAP A2-2.11, EpiSuite
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	5.62E+05	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.992	Assumed (Fluoranthene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	4560.59	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	4560.59	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1016.25	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	7621.87	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4064.99	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	6216.65	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.11E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.82E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.97E-07	Mackay et al., 2000
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.44	Mackay et al., 2000, HHRAP A2-2.11
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.75E+06	EpiSuite, v3.20 (Feb 2007)
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.966	Assumed (Benz(a)pyrene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.05E+06	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.05E+06	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3981.07	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	29858.04	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	15924.29	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	21127.92	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.51E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.38E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	7.40E-07	Mackay et al., 2000
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.41	Mackay et al., 2000, HHRAP A2-2.11
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+06	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed (Fluoranthene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	6.32E+05	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	6.32E+05	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	4.51E+04	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	3.38E+05	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1.80E+05	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	2.35E+04	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.19E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.04	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	8.30E-07	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.12	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.26E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.273	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	211264	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	211264	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	190000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	74411.7	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	39686.24	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	11562	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	6.31E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	9.50E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.25	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	5.01E+05	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.744	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	692	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	692	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0197	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	60000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	30091.32	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	16048.7	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	5689	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.51E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	4.89E-07	EpiSuite
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	2.107875	Mackay et al., 2000, HHRAP A2-2.11, EpiSuite
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	5.01E+06	EpiSuite
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.055	Assumed (Dibenz(a,c)anthracene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1561887	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1561887	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	19498.45	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	146238.34	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	77993.78	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	33500.91	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.16E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.04	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.51E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.50E-08	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.27	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.055	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	31175561	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	31175561	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	580000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	134250	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	71600	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	23499	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.60E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.57	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+05	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.992	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	738	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	738	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0499	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0499	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0499	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0499	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	11000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	3682.5	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1964	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	1644	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
Da	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+02	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	6.40E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	4.22	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.58E+04	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	26	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	26	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.145	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.145	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.145	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.145	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	2100	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	578.25	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	308.4	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	398	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	7.94E+01	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.60E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.35	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.98E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.005	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	373495	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	373495	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00593	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00593	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00593	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00593	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	530000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	230749.76	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	123066.54	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	28057	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.00E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.96E-08	Mackay et al., 2000
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.36	Mackay et al., 2000, HHRAP A2-2.11
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.78E+06	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.992	Assumed (Fluoranthene)
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	8.56E+06	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	8.56E+06	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.01	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	8031	EpiSuite, v3.20 (Feb 2007), HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	60232.5	EpiSuite, v3.20 (Feb 2007), HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	32124	EpiSuite, v3.20 (Feb 2007), HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	1.51E+04	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.51E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	8.91E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.30E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.26	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+04	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.999	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	151	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	151	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.097	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.097	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.097	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.097	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3700	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1989.95	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1061.3	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	678	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+02	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.13	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	7.94E+04	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.994	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	840	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	840	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.057	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.057	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.057	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.057	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	9500	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	5100	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2720	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	1377	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	0.01	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3.98E+02	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.83E-04	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1652	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1652	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	2.45E+04	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1.84E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	9.81E+04	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	23499	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	2	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.20E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+08	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.003	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	910000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	910000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	616595	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+06	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	335781	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.09	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.005	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.41E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.51E+07	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.01	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	830000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	830000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	154881.66	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1.16E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	6.20E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	115892	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.26E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.005	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.40E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.51E+07	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.057	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	830000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	830000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00205	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	154881.66	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1.16E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	6.20E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	115892	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.26E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.005	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.07E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	6.31E+07	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.024	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0012	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0012	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0012	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0012	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	389045.14	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	2.92E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1.56E+06	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	235535	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.09	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3.16E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.43E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+07	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.049	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	61659.5	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	57023	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.00E+07	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.029	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)		N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	123026.88	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	9.23E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4.92E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	97063	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.09	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.00E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	7.31E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+07	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.052	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	61659.5	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	57023	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.00E+07	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.016	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	520000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00234	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	123026.88	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	9.23E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4.92E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	97063	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.09	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.00E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+07	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.09	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	61659.5	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	57023	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.60E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	4.37E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.117	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	239000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	239000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00562	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00562	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00562	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00562	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	26915.35	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	2.02E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1.08E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	30120	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.10	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.19E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.09	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	5.00E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	6.17E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.268	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	97500	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	97500	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00461	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00461	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00461	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00461	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	38018.94	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	2.85E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1.52E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	39296	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
Da	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3.09E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.09	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.10E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+07	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.055	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	162000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00348	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	61659.5	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	57023	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.04	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	4.98E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.221	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	97500	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	97500	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00678	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	19498.45	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1.46E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	7.80E+04	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	23499	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.09	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	3.29E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	6.31E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.664	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	65500	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	65500	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00455	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00455	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00455	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00455	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	38904.51	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	2.92E+05	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1.56E+05	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	39999	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.60E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.10	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3.16E+04	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.09	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.44E-05	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.26E+06	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.77	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	45700	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	45700	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0115	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	7762.47	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	5.82E+04	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3.10E+04	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	11562	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.01E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	6.31E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.09	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005
Variable	Definition	Units	Value	Reference
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н	Henry's Law constant	(atm-m³/mol)	6.75E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.58E+08	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.002	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2360000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2360000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.000705	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.000705	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.000705	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.000705	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	977237.22	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	7.33E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3.91E+06	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	478692	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.09	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	7.94E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.0001	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.88E-06	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+08	US EPA HHRAP, 2005
Fv	Fraction of COPC air concentration in vapor phase	(unitless)	0.002	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2280000	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2280000	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.00092	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	616595	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	4.62E+06	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.47E+06	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	478692	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.00E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.02	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E+05	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	0.0001	US EPA HHRAP, 2005
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.70E-02	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.93	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+02	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00151	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00151	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	0.22	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	10.125	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	5.4	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	19.5	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.80E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.078	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58E+00	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	6.50E+00	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.34E+02	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.87E-06	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.87E-06	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	1.65	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	1.65	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	1.65	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	1.65	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1.26	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	9.45	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	5.04	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	15.5	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.03E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.0149	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.17E+00	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	3.00E-02	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.7	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	6.31E+02	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00179	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00179	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.932	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.932	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.932	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.932	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	0.35	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	11.4	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	6.08	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	33.3	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.80E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.078	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3.16E+00	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	3.70E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.00E+02	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00204	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.00204	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	2.7	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	2.7	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	2.7	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	2.7	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	0.08	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	3.94	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	2.1	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	8.05	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.104	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	5.01E-01	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.20E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	9.03	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.00E+01	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.000616	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.000616	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	6.86	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	6.86	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	6.86	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	6.86	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	0.024	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	0.75	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	0.4	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	8.64	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>mik</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.17E-05	US EPA HHRAP, 2005
Da	Diffusivity of COPC in air	(cm²/s)	0.101	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.00E-01	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	6.11E-05	EpiSuite
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	3.3726	Mackay et al., 2000, HHRAP A2-2.11, EpiSuite
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.31E+05	EpiSuite
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	692.18	HHRAP, A2-2.12.4
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	692.18	HHRAP, A2-2.12.4
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.02	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1840.77	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	13805.79	Mackay et al., 2000, HHRAP A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	7363.09	Mackay et al., 2000, HHRAP A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	4134.82	HHRAP, A2-2.12.1
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.86E-06	HHRAP, A2-2.7
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	HHRAP, A2-2.7
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.66E+03	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	9.70E-02	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.7	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	3.16E+02	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.000265	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.000265	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	1.39	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	0.24	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	8.57	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4.57	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	19.5	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	9.70E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.087	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.58	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.60E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	6.31E+04	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.78	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	2.78	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0651	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0651	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	105	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0651	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0651	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	11	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	568.3	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	303.1	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	1153	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.00E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.001	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	9.91E+02	US EPA HHRAP, 2005
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.40E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.26E+04	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.727	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.727	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.189	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.189	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	77.6	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.189	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.189	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3.6	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	124.5	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	66.4	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	279	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	8.23E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.03	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.40E+02	US EPA HHRAP, 2005
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.90E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.41	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.40E+03	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.117	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	0.117	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.431	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.431	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	-	N/A
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.431	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.431	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3.79	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	28.43	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	15.16	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	93	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	7.90E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.069	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.20E+01	Calculated using Kow, DiToro et al. (2000)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	1.30E-03	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.12	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	2.00E+05	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	19	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	19	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0335	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0335	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	25	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.033	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0335	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	110	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	6000	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3200	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	2799	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.91E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.0542	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.40E+03	US EPA HHRAP, 2005
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	7.10E-04	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	0.73	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.48E+05	US EPA HHRAP, 2005
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	25.2	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	25.2	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0398	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0398	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	1.84	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0398	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0398	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1208.9	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	9066.74	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	4835.6	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	2223	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.30E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.057	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1.91E+03	US EPA HHRAP, 2005
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	2.40E-08	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	1.42	US EPA HHRAP, 2005
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	1.12E+05	Mackay et al., 2000
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	1	Assumed
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	629063	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	629063	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0437	HHRAP, equal to Brag
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0437	HHRAP, equal to Brag
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	1636	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0437	HHRAP, equal to Brag
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0437	HHRAP, equal to Brag
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1.2	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	44.4	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	23.68	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	1963	US EPA HHRAP, 2005
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.10E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.056	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	3	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	6.71E+02	US EPA HHRAP, 2005
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0725	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.03	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.03	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.2	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.03	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	45	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	45	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	45	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	200	Canadian Standards Association 1987
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0135	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.006	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.008	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.036	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.004	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	29	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	29	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	29	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	50	US EPA, 2003. Report No. EPA-822-R-03-032 (Trophic level 3 fish)
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.04875	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.015	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.015	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.15	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.015	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	41	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	41	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	41	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	10	Canadian Standards Association 1987
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.003625	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0015	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.0015	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.01	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0015	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	790	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	790	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	790	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	100	IAEA 1994
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	2.5	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	2	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	2	Baes et al., 1984 HHRAP, A2-2.12.2
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	4	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	2	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	3	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3	Baes et al., 1984 HHRAP, A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	Baes et al., 1984 HHRAP, A2-2.13
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	-	N/A
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.2035	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.15	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.064	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.364	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.062	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	75	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	75	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	75	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.11	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1202.26	McGeer et al. (2003) Based on Baseline Water Concentration - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00525	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0045	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.0045	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0075	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0045	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	19	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	19	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	19	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	1.41E-05	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.1265	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	200	Canadian Standards Association 1987
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.00525	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0045	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.0045	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0075	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0045	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	19	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	19	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	19	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	36.95	Patton et al. (2007) Based on Baseline Water Concentration - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01025	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.007	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.007	Baes et al., 1984 HHRAP, A2-2.12.2
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.02	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.007	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	45	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	45	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	45	Baes et al., 1984 HHRAP, A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.02	Baes et al., 1984 HHRAP, A2-2.13
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	100	Canadian Standards Association 1987
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.16125	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.2	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.009	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.045	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.009	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	900	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	900	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	900	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	104.71	McGeer et al. (2003) Based on Baseline Water Concentration - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	0.85	US EPA HHRAP, 2005
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1800	US EPA HHRAP, 2005
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	1800	US EPA HHRAP, 2005
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.15	US EPA HHRAP, 2005
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.2	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.036	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	-	N/A
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0093	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	58000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	100000	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	50000	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	5.25E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2000	Canadian Standards Association 1987
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	4.70E-07	US EPA HHRAP, 2005
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.01425	US EPA HHRAP, 2005
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.019	US EPA HHRAP, 2005 (Assumed equal to Brgrain)
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.099	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	-	
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.019	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	7000	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	100000	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3000	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	6.11E-06	US EPA HHRAP, 2005
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	0.05	US EPA HHRAP, 2005
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	2.40E+04	McGeer et al. (2003) Based on Baseline Water Concentration (Assumed) - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference	
н	Henry's Law constant	(atm-m³/mol)	-	J/A	
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A	
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A	
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A	
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A	
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A	
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.053	HHRAP, A2-2.12-3	
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.06	"Br" Baes et al., 1984 HHRAP, A2-2.12.3	
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.008	US EPA HHRAP, 2005	
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.032	US EPA HHRAP, 2005	
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.006	US EPA HHRAP, 2005	
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	65	US EPA HHRAP, 2005	
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	65	US EPA HHRAP, 2005	
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	65	US EPA HHRAP, 2005	
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A	
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005	
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF	
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005	
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.01	HHRAP, A2-2.13.1,2,3	
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3	
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3	
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005	
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A	
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A	
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005	
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	156.02	McGeer et al. (2003) Based on Baseline Water Concentration - Site Specific	
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A	
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005	

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	3.5	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	3.5	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	3.5	Baes et al., 1984 HHRAP, A2-2.12.2
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	3.5	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	3.5	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	3.5	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	3.5	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	3.5	Baes et al., 1984 HHRAP, A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.06	Baes et al., 1984 HHRAP, A2-2.13
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.07	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	-	N/A
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.02275	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.025	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.022	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.016	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.002	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	5	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	5	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	5	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.19	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	1.13	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	1.13	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	170	Davis et al. 1993
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.175	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.1	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.1	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.4	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.1	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	8.3	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	8.3	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	8.3	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.02	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	104.89	McGeer et al. (2003) Based on Baseline Water Concentration - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.0013	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.0004	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.0004	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.004	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.0004	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	71	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	71	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	71	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.04	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.05	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.02	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	-	N/A
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.012	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.006	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.006	Baes et al., 1984 HHRAP, A2-2.12.2
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.03	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.006	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	250	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	250	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	250	Baes et al., 1984 HHRAP, A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.08	Baes et al., 1984 HHRAP, A2-2.13
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.04	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.02	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.10	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.06	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.03	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	3000	Davis et al. 1993
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.003625	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.003	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.003	Baes et al., 1984 HHRAP, A2-2.12.2
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.0055	"Bv" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.003	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	1000	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	1000	Baes et al., 1984 HHRAP, A2-2.10
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	1000	Baes et al., 1984 HHRAP, A2-2.10
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	Baes et al., 1984 HHRAP, A2-2.13
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1,2,3
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	160	Empirical measurements of Fish Tissue
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

Variable	Definition	Units	Value	Reference
н	Henry's Law constant	(atm-m³/mol)	-	N/A
ksg	Soil loss constant due to biotic and abiotic degradation	(1/yr)	-	N/A
K <sub>ow</sub>	Octanol-water partitioning coefficient	(unitless)	-	N/A
F <sub>v</sub>	Fraction of COPC air concentration in vapor phase	(unitless)	-	N/A
Bv <sub>ag</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Bv <sub>forage</sub>	Air-to-plant biotransfer factor	(mg COPC/g DW plant) / (mg COPC/g air)	-	N/A
Br <sub>ag (Veg)</sub>	Plant-soil bioconcentration factor for produce	(Unitless - DW Basis)	0.7375	HHRAP, A2-2.12-3
Br <sub>ag (Fruit)</sub>	Plant-soil bioconcentration factor for fruit	(Unitless - DW Basis)	0.9	"Br" Baes et al., 1984 HHRAP, A2-2.12.3
Br <sub>rootveg</sub>	Plant-soil bioconcentration factor for belowground produce	(Unitless - DW Basis)	0.9	US EPA HHRAP, 2005
Br <sub>forage</sub>	Plant-soil bioconcentration factor for forage	(Unitless - DW Basis)	0.25	US EPA HHRAP, 2005
Br <sub>grain</sub>	Plant-soil bioconcentration factor for grain	(Unitless - DW Basis)	0.054	US EPA HHRAP, 2005
Kd <sub>s</sub>	Soil-water partition coefficient	(L/kg);(cm³/g)	62	US EPA HHRAP, 2005
Kd <sub>sw</sub>	Suspended sediments/surface water partition coefficient	(L water/kg suspended sediment)	62	US EPA HHRAP, 2005
Kd <sub>bs</sub>	Bed sediment/sediment pore water partition coefficient	(L water/kg bottom sediment)	62	US EPA HHRAP, 2005
RCF	Root concentration factor	(Unitless - DW Basis)	-	N/A
Ba <sub>beef</sub>	Biotransfer factor for beef	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>game</sub>	Biotransfer factor for game meat	(day/kg FW tissue)	0.00	HHRAP, A2-2.13.1, REF
Ba <sub>milk</sub>	Biotransfer factor for milk	(day/kg WW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>pork</sub>	Biotransfer factor for pork	(day/kg FW tissue)	0.00	US EPA HHRAP, 2005
Ba <sub>chicken</sub>	Biotransfer factor for chicken	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
Ba <sub>egg</sub>	Biotransfer factor for eggs	(day/kg FW tissue)	0.01	US EPA HHRAP, 2005
MF	Metabolic factor	(unitless)	1	US EPA HHRAP, 2005
D <sub>w</sub>	Diffusivity of COPC in water	(cm²/s)	-	N/A
D <sub>a</sub>	Diffusivity of COPC in air	(cm²/s)	-	N/A
ER	Soil enrichment ratio	(unitless)	1	US EPA HHRAP, 2005
BCF/BAF <sub>fish</sub>	Bioconcentration factor/bioaccumulation factor for COPC in fish	(L/kg FW tissue)	1242.17	McGeer et al. (2003) Based on Baseline Water Concentration - Site Specific
BSAF	Biota-to-sediment accumulation factor	(unitless - FW Basis)	-	N/A
Bs	Soil bioavailability factor	(unitless)	1	US EPA HHRAP, 2005

## Table D.70 Site Input Parameters for Bennett Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	-			
$\theta_{sw}$	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
	(	4.5		value of 2 cm was used in this risk assessment.
BD	(g soii/ cm³ soil)	1.5	Soli bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
т.	ĸ	281.5	surface Water body temperature (Note Units)	(USEPA 2005)
' wk	K	201.0		Management
θ	(unitless)	1.026	Temperature correction factor	Default of 1.026 considered appropriate
u	(m/s)	1.110	Current velocity	calculation
C <sub>d</sub>	(unitless)	0.0011	Drag coefficient	Default of 0.0011 considered appropriate
W	(m/s)	3	Average annual wind speed	(USEPA 2005) Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
	(			Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
	(2/22 2)	0.0100		(USEPA 2005)
μ <sub>w</sub>	(g/cm-s)	0.0169	viscosity of water correponding to water temperature	(USEPA 2005)
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	Default of 1.81E-4 considered appropriate
С	(Unitless)	0.02	USLE cover management factor	(USEPA 2005) Recommended value for pasture area in Optario Region (p.98, RUSELEAC
	(Officeos)	0.02		
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON 0 Off)	1		(USEPA 2005)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Soil)	(1 - ON, 0 - Off)	0		
вкg ⊢actor (Water) Bkg Factor (Sediment)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS		Ű		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of combustion)	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS				
ρ <sub>a</sub>	(g/m³)	1200	Density of air	Default of 1200 considered appropriate (LISEPA 2005)
R	(atm-m³/	0.00008205	Universal gas constant	R is a constant
	mol-K)			
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
RO	(cm/yr)	0 14,4715	Average annual irrigation Average annual surface runoff from pervious areas	Irrigation at a minimal based on type of farming in area
	(, j.)		· · · · · · · · · · · · · · · · · · ·	GW = Groundwater recharge = 15% Precipitation (till soil)
				So: $PO = P = (0.15) P = E_V = 0.85 P = E_V$
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/englisn/maps/archives/4thedition/environment/cli mate/049 50
HYDROLOGY/HYDROGEOL	OGY (m <sup>2</sup> )	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	2.25E+03	River surface area	Calculation based on measurements
A	(m²)	2.98E+05	Impervious watershed area receiving COPC deposition	4% considered impervious - estimate
	( 3)	7.445.00		Class
AL d. m	(m²)	7.44E+06	Total water body depth (River)	Estimate
dz (River)	(m)	0.15	Total water body depth (Lake)	N/A for Rivers
λ <sub>7</sub>	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
-2	. ,			(USEPA 2005)
к	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clav in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic
RF	1/vr	QN	USLE rainfall (or erositivity) factor	content was used to determine a K Factor of 0.26. R factor for Durham Hastings, Northumberland, Peterborough, Victoria
	17 yi	50		http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Unitless)	0.25	USLE length-slope factor.	Calculated using the following equation:
				$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope\_length \div const)^{W}$
				Where:
				slope = slope steepness (%) = $0.5\%$
				constant = $72.5$ Imperial or $22.1$ metric
				NN = see Table below
				Table NN Values
				<1 = 0.2
				1 ≤ Slope < 3 = 0.3
				s > 5iope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				ntp.//www.omana.gov.on.ca/engilsi/engineer/racts/00-001.htm#equation
	/ 101 5			
а	(unitless)	1.4	Empirical intercept coefficient	based on watersned area according to the following table (Do NOT interpolate)
				Watershed Area (sq. miles) a (unitless)
				1 (>0.1 but <=1.0) 1.9
				$\begin{array}{ccc} 10 (>1.0 \text{ but } <=10) & 1.4 \\ 100 (>10 \text{ but } <=100) & 4.2 \end{array}$
				100 (>100 u<=100) 1.2 1000 (>100) 0.6
	1			NOTE: 1 Sq. mile = $2.59E + 06 \text{ m}^2$
b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
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Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	2.63E+06	Average volumetric flow rate through water body (River)	water balance model calculation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.15	Depth of water column (in River)	Estimate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	Not measured, therefore calculated using Dss
TSS <sub>(River) Measured</sub>	(mg/L)	2	Total Suspended Solids	CLOCA WQ monitoring of headwaters of black Creek
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate
OCard	(unitless)	0.05	Fraction of organic carbon in bottom sediment	(USEPA 2005) Assumption based on Lake Ontario sediments
	TORS	0.00		
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silace)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	(USEPA 2005) Default of 0.46 considered appropriate
kp	(1/vr)	18	Plant surface loss coefficient	(USEPA 2005) Default of 18 considered appropriate
	(,j.)	0.164	Length of plant exposure to deposition per harvest of the	(USEPA 2005)
тр —	(yi)	0.164	edible portion of the ith plant group	(USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the	Default of 0.252 considered appropriate if calculating fruit separately NA if using weighted Yo (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the	Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the	Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	(USEPA 2005) Default of 0.5 considered appropriate
-3(3-)				(USEPA 2005)
	UPTAKE FACTORS	6	Number of months per year a courie act out to posture	Considered entropriote for Durham Region
1 111 pasture	(montins)	0	and eating grass; the rest of the year is assumend to be	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate (USEPA 2005)
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a
				spx:
				$Qp_{(forage-game)} = (0.577 * BW^{0.727})/1000$
				where
				Qp <sub>(torage-game)</sub> = water ingestion rate (kg DW/day)BW = body weight (g) = 60,000 g (white-tail deer)
QD/forage_mill/	(kg DW/dav)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
	(kg DW/day)	<u>.</u> / 1	Quantity of silage eaten by the dairy cattle per day	(USEPA 2005)
✓P(silage-milk)			Quantity of arain optics by the dairy calle per day	(USEPA 2005)
QP <sub>(grain-milk)</sub>	(Kg DVV/day)	3	Quantity of grain eaten by the dairy cattle per day	USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday.	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

 Table D.71
 Site Input Parameters for Bowmanville Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	(ml_water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
• <sub>SW</sub>	cm <sup>3</sup> soil)	v.2		
Z <sub>s</sub>	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A value of 2 cm was used in this risk assessment.
BD	(g soil/	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
T	К	281.5	surface Water body temperature (Note Units)	(USEPA 2005)
' WK	15 ( 14 )	1.000		Management
θ	(unitless)	1.026	Temperature correction factor	Default of 1.026 considered appropriate (USEPA 2005)
u C	(m/s)	0.474	Current velocity	Calculation based on HYDAT data
C <sub>d</sub>	(0111110000)	0.0011		(USEPA 2005)
VV	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 19/1 - 2000 - nearest wind station - Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate (USEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1.81E-4 considered appropriate
C	(Unitless)	0.02	LISE Cover management factor	(USEPA 2005) Recommended value for pasture area in Ontario Region (p. 98, RUSELEAC
~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	(01111033)	0.02		
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997). Consistent with recommended default.
Та	K	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
Psoil	(g/cm³)	2.7	Solids particle density	(USEPA 2005)
Include Deposition? Bkg Factor (Air)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	1		
Bkg Factor (Soil)	(1 - ON, 0 - Off)	0		
Bkg Factor (Water) Bkg Factor (Sediment)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(vr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	combustion) Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS		1000		
ρ <sub>a</sub>	(g/m³)	1200	Density of air	Usepa 2005)
R	(atm-m³/ mol-K)	0.00008205	Universal gas constant	R is a constant
	(cm/yr)	88 70		Environment Canada climate normals Oshawa - 887.9 yearly precinatation
Г 	(cm/yr)	00.79		
RO	(cm/yr)	14.4715	Average annual irrigation Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
F	(cm/yr)	61	Average annual evapotranspiration	So: RO = P - (0.15) P - Ev = 0.85 P - Ev National Atlas of Canada provides evapotranspiration (inches/year) Value
-v	(0.1.# 9.1)	0.		for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				mtp://atias.mcan.gc.ca/site/englisn/maps/archives/4thedition/environment/cli mate/049_50
HYDROLOGY/HYDROGEOL	OGY			
A <sub>W(Lake)</sub>	(m²)	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²) (m²)	1.68E+05 1.19E+07	River surface area	Calculation based on measurements 7% considered impervious - 80% rural, 20% residential/industrial
	( 2)	4.005.00		
AL	(m²)	1.69E+08	Total watersned area receiving COPC deposition	Management Plan
d <sub>z (River)</sub>	(m)	0.2	Total water body depth (River)	estimate based on pool/riffle ratio
u <sub>z (Lake)</sub> λ <sub>z</sub>	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
				(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the north. For the purposes of this SSRA, silty clay and an average organic
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
IS	(Unitless)	1 15	USLE length-slope factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1 Calculated using the following equation:
20	(01111000)	1.10		$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope\_length \div const)^{NN}$
				Where:
				slope = slope steepness (%) = $1.3$ %
				constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.2	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT interpolate)
				Watershed Area (so, miles) a (unitless)
				$1 (>0.1 \text{ but } <=1.0)   1.9 \\10 (>1.0 \text{ but } <=10)   1.4$
				100 (>10 but <=100) 1.2 1000 (>100) 0.6
				Note: 1 sq. mile = $2.59E+06$ m <sup>2</sup>
L	1			

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	4.07E+07	Average volumetric flow rate through water body (River)	HYDAT
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.2	Depth of water column (in River)	estimate based on pool/riffle ratio
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	20	Total Suspended Solids	PWQMN
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005) Default of 0.053 considered appropriate if calculating fruit separately
Rp(forgap)	(unitless)	0.5	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005) Default of 0.5 considered appropriate
Pp	(unitloss)	0.46	Interception fraction of the adible particip of plant	(USEPA 2005)
INP(silage)		0.40		(USEPA 2005)
кр	(1/yr)	18		(USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Vield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the	Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the	Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the	Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	(USEPA 2005) Default of 0.5 considered appropriate
				(USEPA 2005)
	(months)	6	Number of months per year a cow is set out to pasture	Considered appropriate for Durbam Region
· · · · pasture	(monulo)	Ŭ	and eating grass; the rest of the year is assumend to be eating hav	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				Qp <sub>(forage-game)</sub> = (0.577 * BW <sup>0.727</sup> )/1000
				where
				Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate
1	1		1	

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

# Table D.72 Site Input Parameters for Darlington Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	(m) unterl	0.0	Soil volumetric water content	Default of 0.2 considered entracticts (USERA 2005)
$\theta_{sw}$	(m∟ water/ cm³ soil)	0.2	Son volumetric water content	Derault of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
BD	(a soil/	1.5	Soil bulk density	value of 2 cm was used in this risk assessment. Default of 1.5 considered appropriate (USEPA 2005)
	cm <sup>3</sup> soil)			
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant surface	Recommended value for cations (such as metals) and organics (USEPA 2005)
T <sub>wk</sub>	К	282.5	Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
Α	(unitless)	1 026	Temperature correction factor	Management Default of 1.026 considered appropriate
0	(unitiess)	1.020		(USEPA 2005)
u C.	(m/s)	0.261	Current velocity	Calculation Default of 0.0011 considered appropriate
	(unitiood)	0.0011		(USEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station - Peterborough A (10.8 km/b yearly average)
ρ <sub>w</sub>	(g/cm <sup>3</sup> )	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	(USEPA 2005) Default of 0.4 considered appropriate
	(unitiess)	0.4		(USEPA 2005)
$\mu_{w}$	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	Default of 1.81E-4 considered appropriate
C	(Linitless)	0.02	LISLE cover management factor	(USEPA 2005) Recommended value for pasture area in Optario Region (p. 98, RUSELEAC
	(Officess)	0.02		1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
Psoil	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON. 0 - Off)	1		(USEPA 2005)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
вкg ⊢actor (Soil) Bkg Factor (Water)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
Т.	(yr)	30	combustion)	Assumed no averaging Most conservative
	(31)	00		
ρa	(g/m³)	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m³/	0.00008205	Universal gas constant	R is a constant
01 114 75	mol-K)			
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
RO	(cm/yr) (cm/yr)	14.4715	Average annual irrigation Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
				So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				tor the Durham/York regions are around 24 inches or 61 cm/year. Reference http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
HYDROLOGY/HYDROGEOL	OGY			
A <sub>W(Lake)</sub>	(m²)	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	5.32E+04	River surface area	Calulation
A	(m²)	6.54E+05	Impervious watershed area receiving COPC deposition	4% considered impervious - estimation
AL	(m²)	1.64E+07	Total watershed area receiving COPC deposition	CLOCA
d <sub>z (River)</sub>	(m)	0.5	Total water body depth (River)	Estimation
d <sub>z (Lake)</sub>	(m)	0	i oral water body depth (Lake) Dimensionless viscous sublaver thickness	IN/A IOF RIVERS
٨z	(01111000)	-		(USEPA 2005)
ĸ	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic
RF	1/vr	90	USLE rainfall (or erositivitv) factor	content was used to determine a K Factor of 0.26. R factor for Durham, Hastings, Northumberland, Peterborough Victoria
		0.07		http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Unitless)	0.65	USLE length-slope factor.	Calculated using the following equation: $LS = [0.065 \pm 0.0456(slope) \pm 0.006541(slope)^{21} \times (slope) = epath \pm const)^{NN}$
				Where: slope = slope steepness (%) = 1.1 %
				slope length = length of slope (ft.) or (m) = $5552 \text{ m}$
				constant = 72.5 Imperial or 22.1 metric
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet. http://www.omafra.gov.op.ca/english/engineer/facts/00-001.htm#equation
				ningan manangan on carengionrengineen naciorado a Unititi#equation
2	(unitless)	1 /	Empirical intercent coefficient	Based on watershed area according to the following table (Do NOT
a	(oriness)	1.4		interpolate)
				Watershed Area (so miles) a (unitless)
				0.1 2.1
				1 (>0.1 but <=1.0) 1.9 10 (>1.0 but <=10) 1.4
				100 (>10 but <=10) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	5.77E+06	Average volumetric flow rate through water body (River)	Water Balance Equation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.5	Depth of water column (in River)	Estimation
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	4	Total Suspended Solids	Estimate
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Detault of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	Default of 0.164 considered appropriate
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the	Default of 0.12 considered appropriate
Tp <sub>(silage)</sub>	(yr)	0.16	edible portion of the ith plant group Length of plant exposure to deposition per harvest of the	(USEPA 2005) Default of 0.16 considered appropriate
Yp (produce)	(kg DW/m²)	2.24	edible portion of the ith plant group Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 2.24 considered appropriate (weighted intake of fruit and veg
Yp (veg)	(kg DW/m²)	5.66	plant (productivity) Yield or standing crop biomass of the edible portion of the	based on human consumption) (USEPA 2005) Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.15 considered appropriate
Yp(hau)	(kg DW/m²)	0.5	plant (productivity)	(USEPA 2005)
Yp	(kg DW/m²)	0.0	plant (productivity)	(USEPA 2005)
	(upitloss)	1	plant (productivity)	(USEPA 2005)
V G <sub>ag(forage)</sub>	(unitiess)	1		(USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Uefault of 0.5 considered appropriate (USEPA 2005)
TISSUE CONCENTRATION	UPTAKE FACTORS	0	Number of months	Openidered environments for Durthers Dec. 1
I M <sub>pasture</sub>	(months)	6	and eating grass; the rest of the year is assumend to be eating hav	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx: Qp <sub>(forage-game)</sub> = (0.577 * BW <sup>0.727</sup> )/1000 where Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	(USEPA 2005) Default of 4.1 considered appropriate
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	(USEPA 2005) Default of 3.0 considered appropriate
1	1			I(USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

# Table D.73 Site Input Parameters for Darlington Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL A	(ml_water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
	cm <sup>3</sup> soil)	0.2		
Zs	(cm)	2	Soli mixing zone depth	value of 2 cm was used in this risk assessment.
BD	(g soil/ cm³ soil)	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
T <sub>wk</sub>	К	281.5	surrace Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
	(unitless)	1 026	Temperature correction factor	Management Default of 1 026 considered appropriate
0	(driftess)	1.020		(JSEPA 2005)
U C <sub>d</sub>	(m/s) (unitless)	1.771 0.0011	Current velocity Drag coefficient	Calculation Default of 0.0011 considered appropriate
	(m/c)	2		(USEPA 2005)
~~~~	(11/5)	3	Average annuar who speed	Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate (USEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1 81F-4 considered appropriate
μa	(9,011-0)	0.000101		(USEPA 2005)
С	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC, 1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON, 0 - Off)	1		
Bkg Factor (Air) Bkg Factor (Soil)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Water)	(1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	lime period over which deposition occurs (time period of combustion)	RFP states a 30 year period.
	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
<u>ρ</u> a	(g/m <sup>3</sup> )	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m <sup>3</sup> /	0.0008205	Liniversal das constant	(USEPA 2005) R is a constant
K	mol-K)	0.00000205		
CLIMATE P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
	(cm/sr)	0		Irritation at a minimal based on two of forming in area
RO	(cm/yr) (cm/yr)	0 14.4715	Average annual irrigation Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
			· · · ·	So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ε <sub>ν</sub>	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
	OGY (m <sup>2</sup> )	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m <sup>2</sup> )	6.00E+02	River surface area	Calculation based on measurements
A	(m²)	1.07E+06	Impervious watershed area receiving COPC deposition	30% considered impervious - estimation
AL	(m²)	3.58E+06	Total watershed area receiving COPC deposition	Topo map (direct drainage)
d <sub>z (River)</sub>	(m)	0.15	Total water body depth (River)	Estimation
d <sub>z (Lake)</sub>	(m)	0	Total water body depth (Lake)	N/A for Rivers
$\lambda_z$	(unitless)	4	Dimensionless viscous sublayer thickness	(USEPA 2005)
ĸ	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
, , , , , , , , , , , , , , , , , , ,		0.20		north. For the purposes of this SSRA, silty clay and an average organic
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
10	(Linitiona)	0.40	LISE Flangth-slope factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Unitiess)	0.49	USLE length-slope lactor.	LS = $[0.065 + 0.0456(slope) + 0.006541(slope)^2] \times (slope_length ÷ const)^{NN}$
				slope = slope steepness (%) = 1.0 %
				slope length = length of slope (ft.) or (m) = $2600 \text{ m}$
				NN = see Table below
				Table, NN Values
				<1 = 0.2
				$3 \le \text{Slope} < 5 = 0.3$ $3 \le \text{Slope} < 5 = 0.4$
				≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
	(unitions)	1 4	Empirical intercent coefficient	Record on waterched area according to the following table (Do NOT
a	(unitiess)	1.4	Empirical intercept coefficient	interpolate)
				Watershed Area (sg. miles) a (unitless)
				$1 (>0.1 \text{ but } <=1.0)   1.9 \\10 (>1.0 \text{ but } <=10)   1.4$
				100 (>10 but <=100) 1.2 1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	2.51E+06	Average volumetric flow rate through water body (River)	water balance model calculation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.15	Depth of water column (in River)	Estimation
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	2	Total Suspended Solids	CLOCA WQ monitoring of headwaters of black Creek
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate
OC <sub>sed</sub>	(unitless)	0.05	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	(USEPA 2005) Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	(USEPA 2005) Default of 0.164 considered appropriate
Tn#	(yr)	0.12	edible portion of the ith plant group	(USEPA 2005)
	(91)	0.12	edible portion of the ith plant group	(USEPA 2005)
I P(silage)	(yr)	0.16	edible portion of the ith plant group	(USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.252 considered appropriate if calculating fruit separately NA if using weighted Yp (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.15 considered appropriate (USEPA 2005)
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the	Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	(USEPA 2005) Default of 0.5 considered appropriate
				(USEPA 2005)
	(months)	6	Number of months per year a cowie set out to posture	Considered appropriate for Durham Region
1 111 pasture	(montins)	0	and eating grass; the rest of the year is assumend to be	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a
				spx:
				$Qp_{(forage-game)} = (0.577 * BW^{0.727})/1000$
				where
				BW = body weight (g) = 60,000 g (white-tail deer)
QD/forage_mills)	(kg DW/dav)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
	(kg DW/day)	<u>.</u> / 1	Quantity of silage eaten by the dairy cattle per day	(USEPA 2005)
✓P(silage-milk)			Quantity of grain ages of a high a data and a set a set as	(USEPA 2005)
QP <sub>(grain-milk)</sub>	(Kg DVV/day)	3	Quantity of grain eaten by the dairy cattle per day	UsePA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday.	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

### Table D.74 Site Input Parameters for Farewell/Black Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL θ <sub>sw</sub>	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	cm <sup>3</sup> soil) (cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
BD	(a soil/	1.5	Soil bulk density	value of 2 cm was used in this risk assessment. Default of 1.5 considered appropriate (USEPA 2005)
Fw	cm <sup>3</sup> soil) (unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
т.	(	282.5	Surface Water body temperature (Note Units)	(USEPA 2005) OMAERA 1996 Best Management Practices: Fish and Wildlife Habitat
1 WK	(unitiona)	1.026		Management Default of 1.026 considered appropriate
Ĥ	(unitiess)	1.026		(USEPA 2005)
u C <sub>d</sub>	(m/s) (unitless)	0.307	Current velocity Drag coefficient	Calculation Default of 0.0011 considered appropriate
W	(m/s)	3	Average annual wind speed	(USEPA 2005) Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Peterborough A (10.8 km/h yearly average) Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	(USEPA 2005) Default of 0.4 considered appropriate
	(a/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0.0169 considered appropriate
	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1 81E-4 considered appropriate
μa	(Linitiess)	0.02		(USEPA 2005)
	(Unitiess)	0.02		1997)
PF	(Unitless)	1	USLE supporting practice factor.	Consistent with recommended default.
T <sub>a</sub>	(g/cm <sup>3</sup> )	281.55 2.7	Ambient temperature (Note Units) Solids particle density	7.7*C from Environment Canada for Oshawa Station Default of 2.7 considered appropriate
Include Deposition?	(g, cm )	1		(USEPA 2005)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Water)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(1 - ON, 0 - Off)	0		
T <sub>1</sub> tD	(yr) (yr)	0 30	Time period at the beginning of combustion Time period over which deposition occurs (time period of	Combustion assumed to start at time 0 RFP states a 30 year period.
T <sub>2</sub>	(vr)	30	combustion) Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS	().)	4000		
βa	(g/m³)	1200	Density of air	Uerault of 1200 considered appropriate (USEPA 2005)
R	(atm-m³/ mol-K)	0.00008205	Universal gas constant	R is a constant
CLIMATE P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
1	(cm/yr)	0	Average annual irrigation	Irrigation at a minimal based on type of farming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as GW = Groundwater recharge = 15% Precipitation (till soil)
Ev	(cm/yr)	61	Average annual evapotranspiration	So: RO = P - (0.15) P - EV = 0.85 P - EV National Atlas of Canada provides evapotranspiration (inches/year). Value
				for the Durham/York regions are around 24 inches or 61 cm/year. Reference http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
	OGY (m²)	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	2.75E+05	River surface area	Calculation
A <sub>l</sub>	(m²)	3.63E+06	Impervious watershed area receiving COPC deposition	6% considered impervious
AL dz (Piyor)	(m²) (m)	6.05E+07 0.92	Total watershed area receiving COPC deposition Total water body depth (River)	Calculation HYDAT
d <sub>z (Lake)</sub>	(m)	0	Total water body depth (Lake)	N/A for Rivers
$\lambda_z$	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams) (USEPA 2005)
K	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic content was used to determine a K Factor of 0.26.
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
LS	(Unitless)	0.95	USLE length-slope factor.	Calculated using the following equation:
				$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope\_length \div const)^{VV}$
				Where: slope = slope steepness (%) = 1.2 %
				slope length = length of slope (ft.) or (m) = $16903 \text{ m}$ constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table. NN Values
				<1 = 0.2 1 ≤ Slope < 3 = <b>0.3</b>
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
	(unitiona)	1.0	Empirical intercent coefficient	Record on waterched area according to the following table (Do NOT
а	(unitiess)	1.2	Empirical intercept coefficient	interpolate)
				Watershed Area (sq. miles) a (unitless)
				0.1 2.1 1 (>0.1 but <=1.0) 1.9
				10 (>1.0 but <=10) 1.4 100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	2.22E+07	Average volumetric flow rate through water body (River)	Calculation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.92	Depth of water column (in River)	HYDAT
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	20	Total Suspended Solids	PWQMN
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	NA It using weighted Rp (produce) (USEPA 2005) Default of 0.053 considered appropriate if calculating fruit separately
Rp(forage)	(unitless)	0.5	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005) Default of 0.5 considered appropriate
Pp	(unitless)	0.46	Interception fraction of the adible particip of plant	(USEPA 2005)
INP(silage)		0.40		(USEPA 2005)
кр	(1/yr)	18		(USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the	Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the	Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the	Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	(USEPA 2005) Default of 0.5 considered appropriate
				(USEPA 2005)
	(months)	6	Number of months per year a cow is set out to pasture	Considered appropriate for Durham Region
rinpasture	(montais)	Ŭ	and eating grass; the rest of the year is assumend to be eating hav	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				Qp <sub>(forage-game)</sub> = (0.577 * BW <sup>0.727</sup> )/1000
				where
				Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

# Table D.75 Site Input Parameters for Harmony Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL A	(ml_water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
~sw	cm <sup>3</sup> soil)			
Zs	(cm)	2	Soli mixing zone depth	value of 2 cm was used in this risk assessment.
BD	(g soil/ cm³ soil)	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
T <sub>wk</sub>	К	285	surrace Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
	(unitless)	1 026	Temperature correction factor	Management Default of 1 026 considered appropriate
0	(driftess)	1.020		(USEPA 2005)
U C <sub>d</sub>	(m/s) (unitless)	0.417 0.0011	Current velocity Drag coefficient	Calculation based on HYDAT data Default of 0.0011 considered appropriate
	(m/c)	2		(USEPA 2005)
~~~~	(11/5)	3	Average annuar who speed	Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate (USEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μω	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1 81F-4 considered appropriate
μa	(9,011-0)	0.000101		(USEPA 2005)
С	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC, 1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON, 0 - Off)	1		
Bkg Factor (Air) Bkg Factor (Soil)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Water)	(1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	lime period over which deposition occurs (time period of combustion)	RFP states a 30 year period.
	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS ρ <sub>a</sub>	(g/m <sup>3</sup> )	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m <sup>3</sup> /	0 00008205	I Iniversal das constant	(USEPA 2005) R is a constant
K	mol-K)	0.00008205		
CLIMATE P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
	(cm/sr)	0		Irrigation at a minimal based on two of forming in area
RO	(cm/yr) (cm/yr)	0 14.4715	Average annual irrigation Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
			· · · · ·	So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ε <sub>ν</sub>	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
	OGY (m <sup>2</sup> )	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m <sup>2</sup> )	1.28E+05	River surface area	Calculation based on measurements
A	(m²)		Impervious watershed area receiving COPC deposition	
AL	(m²)	4.68E+07	Total watershed area receiving COPC deposition	CLOCA
d <sub>z (River)</sub>	(m)	1.008	Total water body depth (River)	HYDAT
d <sub>z (Lake)</sub>	(m)	0	Total water body depth (Lake)	N/A for Rivers
٨z	(unitiess)	4	Dimensionless viscous sublayer mickness	(USEPA 2005)
ĸ	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
	10.1,0010	0.20		north. For the purposes of this SSRA, silty clay and an average organic
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
18	(Linitiana)	0.02	LISE E length along factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Unitiess)	0.92	USLE length-slope factor.	LS = $[0.065 + 0.0456(slope) + 0.006541(slope)^2] \times (slope_length ÷ const)^{NN}$
				slope = slope steepness (%) = 1.4 %
				slope length = length of slope (ft.) or (m) = 11500 m constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table, NN Values
				<1 = 0.2
				$3 \le \text{Slope} < 5 = 0.3$ $3 \le \text{Slope} < 5 = 0.4$
				≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
	(unitions)	1.0	Empirical intercent coefficient	Record on waterched area according to the following table (Do NOT
a	(unitiess)	1.2		interpolate)
				Watershed Area (sg. miles) a (unitless)
				$1 (>0.1 \text{ but } <=1.0)   1.9 \\10 (>1.0 \text{ but } <=10)   1.4$
				100 (>10 but <=100) 1.2 1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	1.48E+07	Average volumetric flow rate through water body (River)	Calculation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	1.008	Depth of water column (in River)	HYDAT
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	Not measured, therefore calculated using D <sub>SS</sub>
TSS <sub>(River) Measured</sub>	(mg/L)	30	Total Suspended Solids	Estimate based on urban proportion and old PWQMN data (future interpolation)
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (LISEPA 2005)
OC <sub>sed</sub>	(unitless)	0.1	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC	TORS	0.00	Interpretion function of the solution of the solution	
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Detault of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	(USEPA 2005) Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	(USEPA 2005) Default of 0.164 considered appropriate
			edible portion of the ith plant group	(USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the	Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the	Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the	Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Plant (productivity) Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	plant (productivity) Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 0.8 considered appropriate
VG <sub>os</sub> (ferrare)	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
	(unitions)			(USEPA 2005)
VG <sub>ag(silage)</sub>	(unitiess)	0.5		(USEPA 2005)
TISSUE CONCENTRATION	UPTAKE FACTORS			
I m <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be eating hav	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a
				$Qp_{(forage-game)} = (0.577 * BW^{0.121})/1000$
				where
				Qp <sub>(torage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silane-milk)</sub>	(kg DW/dav)	4.1	Quantity of silage eaten by the dairy cattle per day	(USEPA 2005) Default of 4.1 considered appropriate
Qn/	(kg DW/dav)	3	Quantity of grain eaten by the dairy cattle per day	(USEPA 2005) Default of 3.0 considered appropriate
≪r(grain-milk)	(	0		(USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

 Table D.76
 Site Input Parameters for McLaughlin Bay

Parameter	Units	Value	Parameter Description	Rationale
GENERAL			·	
$\theta_{sw}$	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
7.	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
-s	(only	-		value of 2 cm was used in this risk assessment.
BD	(g soil/	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
	· · · ·		surface	(USEPA 2005)
T <sub>wk</sub>	К	282	Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
θ	(unitless)	1.026	Temperature correction factor	Default of 1.026 considered appropriate
	(			(USEPA 2005)
u C	(m/s)	0	Current velocity	Not applicable to equations for lakes
C <sub>d</sub>	(unitiess)	0.0011	Drag coefficient	(USEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
	(g/cm3)	1	Density of water	Peterborough A (10.8 km/h yearly average)
Ρw	(g/ciii )			(USEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
	(a/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0.0169 considered appropriate
μw	(9/011/3)	0.0100	viscosity of water correponding to water temperature	(USEPA 2005)
μ <sub>a</sub>	(g/cm-s)	0.000174	Viscosity of air corresponding to air temperature	Viscosity of air at 5 degC (Doherty and Franzini, 1987)
С	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
	(			Consistent with recommended default.
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON, 0 - Off)	1		
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Soil) Bkg Factor (Water)	(1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - <u>ON</u> , 0 - Off)	0		
FACILITY PARAMETERS				
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Compustion assumed to start at time 0
ίD	(yr)	30	combustion)	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS				
βa	(g/m <sup>3</sup> )	1270	Density of air	Density of air at 5 degC (Doherty and Franzini, 1987)
ĸ	(atm-m <sup>3</sup> / mol-K)	0.00008205	Universal gas constant	R is a constant
CLIMATE				
Р	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
	(cm/yr)	0	Average annual irrigation	Irrigation at a minimal based on type of farming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
				So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ε <sub>ν</sub>	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				mate/049 50
	0GY (m <sup>2</sup> )	2 00E±05	Lake surface area	Topo map (direct drainage)
Aw(Rise)	(m²)	0	River surface area	N/A for Lakes
A,	(m²)	1.19E+05	Impervious watershed area receiving COPC deposition	6% considered impervious - estimate
1	( )			
AL	(m²)	1.99E+06	Total watershed area receiving COPC deposition	Topo map (direct drainage)
d <sub>z (River)</sub>	(m)	0	Total water body depth (River)	N/A for Lakes
a <sub>z (Lake)</sub>	(m)	3.0	i otal water body depth (Lake)	Calculated as per recommendations: $d_r = d_{uo} + d_{bo}$
λ	(unitless)	4	Dimensionless viscous sublaver thickness	Default of 4 considered appropriate
.*2	(		·····	(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				content was used to determine a K Factor of 0.26.
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
19	(I Initlace)	0.47	USLE length-slope factor	nttp://www.omatra.gov.on.ca/english/engineer/tacts/00-001.htm#tab1
LO	(Onitiess)	0.47		$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope \ length \div const)^{NN}$
				Where:
				slope = slope steepness ( $\frac{7}{6}$ ) = 1.7 $\frac{7}{6}$ slope length = length of slope (ft.) or (m) = 800 m
				constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table. NN Values
				<1 = 0.2
				$1 \le \text{Slope} < 3 = 0.3$ $3 \le \text{Slope} < 5 = 0.4$
				≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				ningan www.omana.gov.on.ca/englisn/engliteen/lacts/00-001.httl#equation
а	(unitless)	1.9	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
				interpolate)
				Watershed Area (sq. miles) a (unitless)
				0.1 2.1 1 (>0 1 but <=1 0) 1 9
				10 (>1.0 but <=10) 1.4
				100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

 Table D.76
 Site Input Parameters for McLaughlin Bay

Parameter	Units	Value	Parameter Description	Rationale
b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	2.87E+05	Average volumetric flow rate through water body (Lake)	Total volumetric flowrate is estimated as RO times the drainage area.
Vf <sub>x (River)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (River)	
d <sub>wc (Lake)</sub>	(m)	3	Depth of water column (in Lake)	
d <sub>wc (River)</sub>	(m)	0	Depth of water column (in River)	N/A for Lakes
d <sub>bs (Lake)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in Lake).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
d <sub>bs (River)</sub>	(m)	0	Depth of upper benthic sediment layer (in River).	N/A for Lakes
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	1825	Suspended solids deposition rate	A default value of 1,825 for quiescent lakes or ponds is recommended (non-
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	flowing water) N/A for Lakes
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	Not measured, therefore calculated using D <sub>SS</sub>
TSS <sub>(River) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Lakes
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Userault of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.053	Fraction of organic carbon in bottom sediment	Nriagu J. O. and Coker R.D. 1976. Emission of Sulfur from Lake Ontario Sediments. Liminology and Oceanography. Vol. 21, no. 4.
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	Default of 0.164 considered appropriate
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the	Default of 0.12 considered appropriate
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the	Default of 0.16 considered appropriate
Yp (produce)	(kg DW/m²)	2.24	edible portion of the ith plant group Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 2.24 considered appropriate (weighted intake of fruit and veg
Yp (veg)	(kg DW/m²)	5.66	plant (productivity) Yield or standing crop biomass of the edible portion of the	based on human consumption) (USEPA 2005) Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.15 considered appropriate
Yp <sub>(hau)</sub>	(ka DW/m²)	0.5	plant (productivity) Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 0.5 considered appropriate
Vp	(kg DW//m²)	0.8	plant (productivity)	(USEPA 2005)
r P(silage)	(kg Dw/m-)	0.0	plant (productivity)	(USEPA 2005)
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Uefault of 1 considered appropriate (USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Default of 0.5 considered appropriate (USEPA 2005)
TISSUE CONCENTRATION U	JPTAKE FACTORS			
Tm <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	eating nay Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				$Qp_{(forage-game)} = (0.577 * BW^{0.727})/1000$
				where Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day)
				BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate
	ļ			(USEPA 2005)

Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate	
				(USEPA 2005)	

 Table D.76
 Site Input Parameters for McLaughlin Bay

Parameter	Units	Value	Parameter Description	Rationale
Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate
Qs <sub>(beef)</sub>	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate
QS(game)	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate (USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Default of 0.37 considered appropriate (USEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				$Qw = 0.099 * BW^{0.90}$
				where
				Qw = water ingestion rate (L/day)
Qw <sub>(chicken)</sub>	(L/day)	0.14	Quantity of water ingested by the chicken each day	Estimated using equation 3-15 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.059 * BW <sup>0.67</sup>
				where
				Qw = water ingestion rate (L/day)
0	(1. /dou))	2.04		BW = body weight (kg) = 3.17 kg (Canada goose)
QW <sub>(game)</sub>	(L/day)	3.94	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where Ow – water indection rate (L(day)
				BW = body weight (kg) = 60 kg (white-tail deer)
	(unitions)	4	Fraction of foreign group on contaminated call and	
F (forage)	(unitiess)	I	ingested by the animal	(USEPA 2005)
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and ingested by the animal	UsePA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>L(beef)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the cow	Value of 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
F <sub>L(pork)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>L(chicken)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>L(game)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the animal	Value of 1.0 considered conservative (Note: water ingestion by game not considered in HHRAP)
F <sub>R(beef)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the cow	N/A for lakes
F <sub>R(pork)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the swine	N/A for lakes
F <sub>R(chicken)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the chicken	N/A for lakes
F <sub>R(game)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the animal	N/A for lakes
f <sub>lipid</sub>	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate (USEPA 2005)

 Table D.77
 Site Input Parameters for Oshawa Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	(mail a supplicity of			
$\theta_{\sf sw}$	(mL water/ cm <sup>3</sup> soil)	0.2	Soli volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
BD	(a soil/	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
	cm <sup>3</sup> soil)			
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant surface	Recommended value for cations (such as metals) and organics (USEPA 2005)
T <sub>wk</sub>	К	285	Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
θ	(unitless)	1.026	Temperature correction factor	Management Default of 1.026 considered appropriate
	(a			(USEPA 2005)
u C.	(m/s) (unitless)	0.263	Current velocity Drag coefficient	Calculation based on HYDAT data Default of 0 0011 considered appropriate
	(a		2.09.000.000	(USEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station - Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	(USEPA 2005) Default of 0.4 considered appropriate
				(USEPA 2005)
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate (USEPA 2005)
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	Default of 1.81E-4 considered appropriate
С	(Unitless)	0.02	USLE cover management factor.	(USEPA 2005) Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
	(0			1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997). Consistent with recommended default.
Ta	ĸ	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	( <u>1 - O</u> N, 0 - Off)	1		(USEFA 2003)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Soll) Bkg Factor (Water)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
Ta	(vr)	30	combustion)	Assumed no averaging Most conservative
CONSTANTS	().)			
ρ <sub>a</sub>	(g/m³)	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m <sup>3</sup> /	0.00008205	Universal gas constant	R is a constant
	mol-K)		-	
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
	(	0		Interction of a sector of the sector of the sector is a sec-
RO	(cm/yr)	14.4715	Average annual imgation Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
				So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
HYDROLOGY/HYDROGEOL	OGY			
A <sub>W(Lake)</sub>	(m²)	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	7.07E+05	River surface area	Calculation based on measurements
	()	1.012+07		Management Plan
AL	(m²)	1.20E+08	Total watershed area receiving COPC deposition	
d <sub>z (River)</sub>	(m) (m)	2.6125	Total water body depth (River)	N/A for Rivers
~ (Lake) λ <sub>7</sub>	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
·-	. ,			(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
19	(1 Initless)	0 02	USLE length-slope factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Onitiess)	0.92	USLE length-slope lactor.	LS = $[0.065 + 0.0456(slope) + 0.006541(slope)^2] \times (slope length ÷ const)^{NN}$
				slope = slope steepness (%) = 1.0 %
				slope length = length of slope (ft.) or (m) = $21400 \text{ m}$
				NN = see Table below
				<1 = 0.2
				$1 \le \text{Slope} < 3 = 0.3$
				≥ 5 = 0.5
				Universal Onit Long Equation (USLE) Eastshart
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.2	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
				interpolate)
				Watershed Area (sq. miles) a (unitless)
				0.1 2.1 1 (>0.1 but <=1 0) 1 9
				10 (>1.0 but <=10) 1.4
				100 (>10 but <=100) 1.2 1000 (>100) 0.6
	1			Note: 1 sq. mile = $2.59E+06 \text{ m}^2$

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	4.30E+07	Average volumetric flow rate through water body (River)	Calculation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	2.6125	Depth of water column (in River)	HYDAT-prorate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	Not measured, therefore calculated using D <sub>SS</sub>
TSS <sub>(River) Measured</sub>	(mg/L)	25	Total Suspended Solids	CLOCA, 2002. Oshawa Creek Watershed Management Plan
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.1	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC Rp (produce)	CTORS (unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	based on human consumption) (USEPA 2005) Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	INA IT USING WEIGNTED KP (produce) (USEPA 2005) Default of 0.053 considered appropriate if calculating fruit separately
Rp(ferrore)	(unitless)	0.5	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005)
Rp(giloge)	(unitless)	0.46	Interception fraction of the edible portion of plant	(USEPA 2005) Default of 0.46 considered appropriate
kp	(1/4)	10		(USEPA 2005)
κμ	(1/y1)	0.404	Frank surface loss coefficient	(USEPA 2005)
тр —	(yr)	0.164	edible portion of the ith plant group	(USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.252 considered appropriate if calculating fruit separately NA if using weighted Yp (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.15 considered appropriate (USEPA 2005)
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.5 considered appropriate (USEPA 2005)
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.8 considered appropriate (USEPA 2005)
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Default of 1 considered appropriate (USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Default of 0.5 considered appropriate (USEPA 2005)
TISSUE CONCENTRATION	UPTAKE FACTORS			
T m <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be eating hay	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate (USEPA 2005)
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate (USEPA 2005)
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook (USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				$Qp_{(forage-game)} = (0.577 * BW ^{0.727})/1000$ where $Qp_{(forage-game)} =$ water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate (USEPA 2005)
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

### Table D.78 Site Input Parameters for Robinson Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	ente	Faido		
$\theta_{sw}$	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A value of 2 cm was used in this risk assessment.
BD	(g soil/	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
Twe	К	282.5	surface Water body temperature (Note Units)	(USEPA 2005) OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
WK .	<i></i>			Management
θ	(unitless)	1.026	l emperature correction factor	USEPA 2005)
u C <sub>d</sub>	(m/s) (unitless)	0.199 0.0011	Current velocity Drag coefficient	Calculation Default of 0.0011 considered appropriate
W	(m/s)	3	Average annual wind speed	(USEPA 2005) Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
ρ <sub>w</sub>	(g/cm <sup>3</sup> )	1	Density of water	Peterborough A (10.8 km/h yearly average) Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	(USEPA 2005) Default of 0.4 considered appropriate
Щ.,,	(q/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0.0169 considered appropriate
	(a/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005)
μa	(g/off 3)	0.000101		(USEPA 2005)
С	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC, 1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997). Consistent with recommended default.
Та	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON, 0 - Off)	1		(USEFA 2003)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Soil) Bkg Factor (Water)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(yr)	0	Time period at the beginning of compution	Compustion assumed to start at time 0
tD	(yr)	30	Time period at the beginning of combustion	RFP states a 30 year period.
	()-)		combustion)	
	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
ρ <sub>a</sub>	(g/m³)	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m <sup>3</sup> /	0.00008205	Universal gas constant	R is a constant
	mol-K)		-	
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
		0		Injection at a minimal based on two of forming in pres
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as GW = Groundwater recharge = 15% Precipitation (till soil)
				So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
HYDROLOGY/HYDROGEOL	OGY	•		
A <sub>W(Lake)</sub>	(m²)	0 1 30E±04	Lake surface area	N/A for Rivers
A <sub>l</sub>	(m²)	1.71E+05	Impervious watershed area receiving COPC deposition	3% considered impervious
A	(m²)	5.70E+06	Total watershed area receiving COPC deposition	CLOCA WQ monitoring of headwaters of black Creek
d <sub>z (River)</sub>	(m)	0.3	Total water body depth (River)	Estimate
d <sub>z (Lake)</sub>	(m)	0	Total water body depth (Lake)	N/A for Rivers
λz	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
ĸ	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the north. For the purposes of this SSRA, silty clay and an average organic
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
15	(I Initless)	0.64	LISE E length-slope factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
23	(Ondess)	0.04		$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^2] \times (slope\_length \div const)^{NN}$
				Where: slope = slope steepness (%) = 1.36 %
				slope length = length of slope (ft.) or (m) = $3574 \text{ m}$
				constant = 72.5 Imperial or 22.1 metric
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				$3 \leq \text{Slope} < 5 = 0.4$
				2 0 = 0.0
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
	(unitiona)	1 4	Empirical intercent coefficient	Record on watershed area according to the following table (Do NOT
a	(uniness)	1.4		interpolate)
				Watershed Area (so miles) a (unitless)
				0.1 2.1
				$\begin{array}{ccc} 1 (>0.1 \text{ but } <=1.0) & 1.9 \\ 10 (>1.0 \text{ but } <=10) & 1.4 \end{array}$
				100 (>10 but <=10) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	1.89E+06	Average volumetric flow rate through water body (River)	Water Balance Equation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.3	Depth of water column (in River)	Estimate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	2	Total Suspended Solids	CLOCA WQ monitoring of headwaters of black Creek
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate (USEPA 2005)
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate (USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.252 considered appropriate if calculating fruit separately NA if using weighted Yp (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.15 considered appropriate (USEPA 2005)
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.5 considered appropriate (USEPA 2005)
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.8 considered appropriate (USEPA 2005)
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Default of 1 considered appropriate (USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Default of 0.5 considered appropriate (USEPA 2005)
	(monthe)	6	Number of months per year a cow is got out to post up	Considered appropriate for Durbom Pegion
1111pasture	(monuns)	0	and eating grass; the rest of the year is assumend to be	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate (USEPA 2005)
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate (USEPA 2005)
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook (USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a
				$Qp_{(forege, name)} = (0.577 * BW^{0.727})/1000$
				where
				Qp <sub>(torage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate (USEPA 2005)
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate
Qs <sub>(beef)</sub>	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
QS <sub>(port</sub> )	(kg/dav)	0.37	Quantity of soil eaten by the swine day	(USEPA 2005) Default of 0.37 considered appropriate
(poik)	(			(USEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where Qw = water ingestion rate (L/day)
0	(L/dov)	E 09	Quantity of water ingested by the swine each day	BW = body weight (kg) = 755 kg (domestic cattle)
QW <sub>(pork)</sub>	(L/day)	5.06	Quantity of water ingested by the swine each day	(USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	Estimated using equation 3-15 from the Wildlife Exposure Factors Handbook
(	· · · ·			(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day) BW = body weight (kg) = 3.17 kg (Canada goose)
Qw <sub>(game)</sub>	(L/day)	3.94	Quantity of water ingested by the game animal each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				spx:
				C
				Qw = 0.099 * BW ***
				where
				Qw = water ingestion rate (L/day)
				BW = BOUY Weight (kg) = 60 kg (White-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and	Default of 1.0 considered appropriate
	(1)	A	ingested by the animal	(USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	by the animal	(USEPA 2005)
F <sub>L(beef)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
F <sub>L(pork)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the swine	N/A to rivers
F <sub>L(chicken)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the chicken	N/A to rivers
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
F <sub>R(beef)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the cow	Value or 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
FR(pork)	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F R(chicken)	(unitiess)	1	chicken	value or 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
► <sub>R(game)</sub>	(unitiess)	Т	animal	considered in HHRAP)
f <sub>lipid</sub>	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
				(USEPA 2005)

 Table D.79
 Site Input Parameters for Second Marsh

Parameter	Units	Value	Parameter Description	Rationale
GENERAL	(ml. wotor/	0.0	Soil volumetrie water content	Default of 0.2 considered appropriate (USERA 2005)
θ <sub>sw</sub>	cm <sup>3</sup> soil)	0.2	Son volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Zs	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A value of 2 cm was used in this risk assessment.
BD	(g soil/	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
Tt	к	282	surface Water body temperature (Note Units)	(USEPA 2005) OMAFRA, 1996, Best Management Practices: Fish and Wildlife Habitat
' WK		202		Management
θ	(unitless)	1.026	l emperature correction factor	Usepa 2005)
u C	(m/s)	0	Current velocity	Not applicable to equations for lakes
U d	(unitess)	0.0011		(USEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station - Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μω	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0.0169 considered appropriate
	(q/cm-s)	0.000174	Viscosity of air corresponding to air temperature	(USEPA 2005)
μ <sub>a</sub> C	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
PF	(Linitless)	1	LISE E supporting practice factor	1997) Recommended value for no suporting practice (p.37, RUSELEAC, 1997)
	(01111033)			Consistent with recommended default.
Ta	K	281.55	Ambient temperature (Note Units) Solids particle density	7.7*C from Environment Canada for Oshawa Station Default of 2.7 considered appropriate
Psoil	(g/cm)	2.1		(USEPA 2005)
Include Deposition? Bkg Factor (Air)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	1 0		
Bkg Factor (Soil) Bkg Factor (Water)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
Τ <sub>2</sub>	(yr)	30	combustion) Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS				
ρ <sub>a</sub> R	(g/m³)	1270 0.00008205	Density of air	Density of air at 5 degC (Doherty and Franzini, 1987) R is a constant
к 	mol-K)	0.00000200		
CLIMATE P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
1	(cm/ur)	0		Irrigation at a minimal bacad on type of forming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
			• • • • • •	So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli mate/049_50
HYDROLOGY/HYDROGEOL A <sub>W(Lake)</sub>	OGY (m²)	1.23E+05	Lake surface area	Friends of Second Marsh website
A <sub>W(River)</sub>	(m²)	0	River surface area	N/A for Lakes
A <sub>i</sub>	(m²)	1.20E+05	Impervious watershed area receiving COPC deposition	5% considered impervious - estimate
AL	(m²)	2.41E+06	Total watershed area receiving COPC deposition	Topo map (direct drainage)
d <sub>z (River)</sub>	(m)	0	Total water body depth (River)	N/A for Lakes
C <sub>z (Lake)</sub>	(m)	1.0		$d_z = d_{wc} + d_{bs}$
λz	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic content was used to determine a K Factor of 0.26
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
LS	(Unitless)	0.26	USLE length-slope factor.	nup://www.omarra.gov.on.ca/english/engineer/tacts/00-001.htm#tab1 Calculated using the following equation:
				LS = $[0.065 + 0.0456(slope) + 0.006541(slope)^2] \times (slope_length \div const)^{NN}$
				Where:
				slope = slope steepness (%) = $0.9$ % slope length = length of slope (ft ) or (m) = $1494$ m
				constant = 72.5 Imperial or 22.1 metric
				ININ = See Table below
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Online and Encoding (UOLE). Excelote an
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.9	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
				Interpolate)
				Watershed Area (sq. miles) a (unitless)
				1 (>0.1 but <=1.0) 1.9
				10 (>1.0 but <=10) 1.4 100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

### Table D.79 Site Input Parameters for Second Marsh

Parameter	Units	Value	Parameter Description	Rationale
b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate
Vf <sub>x (Lake)</sub>	(m³/yr)	3.48E+05	Average volumetric flow rate through water body (Lake)	(USEPA 2005) Total volumetric flowrate is estimated as RO times the drainage area.
Vf <sub>x (River)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (River)	N/A for Lakes
due (Leke)	(m)	1	Depth of water column (in Lake)	Estimated for Marsh
d (Dirac)	(m)	0	Depth of water column (in River)	N/A for Lakes
	(m)	0.03	Depth of upper benthic sediment layer (in Lake)	The LIS EPA recommended range is from 0.01 to 0.05 m with a
ubs (Lake)	(11)	0.05	Deptir of upper bentific sediment layer (in Lake).	recommended value of 0.03 m.
d <sub>bs (River)</sub>	(m)	0	Depth of upper benthic sediment layer (in River).	N/A for Lakes
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	1825	Suspended solids deposition rate	A default value of 1,825 for quiescent lakes or ponds is recommended (non-
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	flowing water) N/A for Lakes
TSS <sub>(Lake)</sub> Measured	(mg/L)	0	Total Suspended Solids	Not measured, therefore calculated using D <sub>SS</sub>
TSS <sub>(River) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Lakes
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate
00	(unitless)	0.1	Fraction of organic carbon in bottom sediment	(USEPA 2005) Hill A and Cardaci Mia, 2004 Denitrification and organic corbon availability.
UUsed	(unitiess)	0.1	Fraction of organic carbon in bottom sediment	in riparian wetland soils and subsurface sediments. Soil Science Society of America Journal vol. 68. no. 1 pp. 320-325.
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rn (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Dased on numan consumption) (USEPA 2005)
itp (veg)	(unitiess)	0.902		NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate (USEPA 2005)
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate (USEPA 2005)
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate (USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the	Default of 0.12 considered appropriate
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the	Default of 0.16 considered appropriate
Yp (produce)	(kg DW/m²)	2.24	edible portion of the ith plant group Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 2.24 considered appropriate (weighted intake of fruit and veg
Yp (veg)	(ka DW/m²)	5.66	plant (productivity) Yield or standing crop biomass of the edible portion of the	based on human consumption) (USEPA 2005) Default of 5.66 considered appropriate if calculating veg separately
Yn (fruit)	(kg D)\//m²)	0.252	plant (productivity)	NA if using weighted Yp (produce) (USEPA 2005)
		0.232	plant (productivity)	NA if using weighted Yp (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.15 considered appropriate (USEPA 2005)
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.5 considered appropriate (USEPA 2005)
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.8 considered appropriate (USEPA 2005)
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Default of 0.5 considered appropriate
				(USEPA 2005)
Tm <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook (USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx: Qp <sub>(forage-game)</sub> = (0.577 * BW <sup>0.727</sup> )/1000 where Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate

				(USEPA 2005)
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate
				(USEPA 2005)

 Table D.79
 Site Input Parameters for Second Marsh

Parameter	Units	Value	Parameter Description	Rationale
Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	(USEPA 2005) Default of 3.3 considered appropriate
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate
Qs <sub>(beef)</sub>	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
QS <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate (USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Default of 0.37 considered appropriate (USEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				$Qw = 0.099 * BW^{0.90}$
				where Qw = water ingestion rate (L/day)
0	(1. (-1)	5.00	Quantity of water ingracted by the swine cosh day	BW = body weight (kg) = 755 kg (domestic cattle)
QW <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	(USEPA, 1993):
				$Qw = 0.099 * BW^{0.90}$
				where
				Qw = water ingestion rate (L/day)
Qw <sub>(chicken)</sub>	(L/day)	0.14	Quantity of water ingested by the chicken each day	Estimated using equation 3-15 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				BW = body weight (kg) = 3.17 kg (Canada goose)
Qw <sub>(game)</sub>	(L/day)	3.94	Quantity of water ingested by the game animal each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a
				$Qw = 0.099 * BW^{0.90}$
				where
				Qw = water ingestion rate (L/day) PW = body weight (kg) = 60 kg (white toil door)
				DVV = body weight (kg) = 00 kg (white-tail deel)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and ingested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and ingested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>L(beef)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the cow	Value of 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
F <sub>L(pork)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
$F_{L(chicken)}$	(unitless)	1	Fraction of contaminanted lake water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>L(game)</sub>	(unitless)	1	Fraction of contaminanted lake water ingested by the animal	Value of 1.0 considered conservative (Note: water ingestion by game not considered in HHRAP)
F <sub>R(beef)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the cow	N/A for lakes
F <sub>R(pork)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the swine	N/A for lakes
F <sub>R(chicken)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the chicken	N/A for lakes
F <sub>R(game)</sub>	(unitless)	0	Fraction of contaminanted river water ingested by the animal	N/A for lakes
f <sub>lipid</sub>	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate (USEPA 2005)

 Table D.80
 Site Input Parameters for Soper Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL θενν	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
	cm <sup>3</sup> soil)	2	Soil mixing zone denth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default) A
2s	(cm)	2		value of 2 cm was used in this risk assessment.
BD	(g soil/ cm³ soil)	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant surface	Recommended value for cations (such as metals) and organics (USEPA 2005)
T <sub>wk</sub>	к	281.5	Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
θ	(unitless)	1.026	Temperature correction factor	Default of 1.026 considered appropriate
u	(m/s)	0.404	Current velocity	Calculation based on HYDAT data
C <sub>d</sub>	(unitless)	0.0011	Drag coefficient	Default of 0.0011 considered appropriate (USEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station - Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1.81E-4 considered appropriate
C	(Unitless)	0.02	USLE cover management factor.	(USEPA 2005) Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
DE	(Unitloss)	1		1997)
T <sub>a</sub>	K	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate (USEPA 2005)
Include Deposition?	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	1		
Bkg Factor (Soil)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
ыку настог (vvater) Bkg Factor (Sediment)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS	(g/m <sup>3</sup> )	1200	Density of air	Default of 1200 considered appropriate
Pa	(3,)	0.00008205	Liniversal das constant	(USEPA 2005)
	mol-K)	0.00000203		
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
I	(cm/yr)	0	Average annual irrigation	Irrigation at a minimal based on type of farming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as GW = Groundwater recharge = 15% Precipitation (till soil)
				$S_{0}$ , $P_{0} = P_{-}(0.15)$ , $P_{-}$ , $E_{1} = 0.85$ , $P_{-}$ , $E_{1}$
E <sub>v</sub>	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli
				mate/049_50
	OGY (m <sup>2</sup> )	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	8.20E+04	River surface area	Calculation based on measurements
A <sub>I</sub>	(m²)	5.31E+06	Impervious watershed area receiving COPC deposition	7% considered impervious - 80% rural, 20% residential/industrial
AL	(m²)	7.58E+07	Total watershed area receiving COPC deposition	CLOCA, 2000. Bowmanville/Soper Creek Watershed Aquatic Resource Management Plan
d <sub>z (River)</sub>	(m)	0.3	Total water body depth (River)	Estimate based on pool/riffle ratio
d <sub>z (Lake)</sub> λ <sub>z</sub>	(m) (unitless)	0 4	Dimensionless viscous sublayer thickness	N/A for Rivers Default of 4 considered appropriate for lakes (N/A to rivers and streams)
	、 <i>,</i> ,			(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				content was used to determine a K Factor of 0.26.
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LS	(Unitless)	0.94	USLE length-slope factor.	Calculated using the following equation: $I_s = [0.065 \pm 0.0456(slope) \pm 0.006541(slope)^2] \times (slope_length \pm const)^{NN}$
				slope = slope steepness (%) = 1.2 %
				slope length = length of slope (ft.) or (m) = $16350 \text{ m}$ constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.2	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
~	(4		,	interpolate)
				Watershed Area (sq. miles) a (unitless)
				0.1 2.1 1 (>0.1 but <=1.0) 1.9
				10 (>1.0 but <=10) 1.4 100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	2.71E+07	Average volumetric flow rate through water body (River)	HYDAT
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.3	Depth of water column (in River)	Estimate based on pool/riffle ratio
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore $D_{SS}$ was not required.
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	25	Total Suspended Solids	PWQMN
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005) Default of 0.053 considered appropriate if calculating fruit separately
Rp(forgap)	(unitless)	0.5	Interception fraction of the edible portion of plant	NA if using weighted Rp (produce) (USEPA 2005) Default of 0.5 considered appropriate
Pp	(unitless)	0.46	Interception fraction of the adible particip of plant	(USEPA 2005) Default of 0.46 considered appropriate
INP(silage)		0.40		(USEPA 2005)
кр	(1/yr)	18		(USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the	Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the	Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the	Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the	Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	(USEPA 2005) Default of 0.5 considered appropriate
				(USEPA 2005)
	(months)	6	Number of months per year a cow is set out to pasture	Considered appropriate for Durham Region
i i pasture	(months)	Ŭ	and eating grass; the rest of the year is assumend to be eating hav	
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				$Qp_{(forage-game)} = (0.577 * BW^{0.727})/1000$
				where Qp <sub>(forage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	(USEPA 2005) Default of 4.1 considered appropriate
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	(USEPA 2005) Default of 3.0 considered appropriate
(gran milk)				(USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
				(USEPA 2005)
Qs <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	Ulsepa 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handbook (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
			-	BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>	(1)	0.4.4	Overtity of water is prosted by the chicker acceleday	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day	BW = body weight (kg) = 3.17 kg (Canada goose)
(game)	(L/uay)	3.54	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water indestion rate (L/dav)
				BW = body weight (kg) = 60 kg (white-tail deer)
F <sub>(forage)</sub>	(unitless)	1	Fraction of forage grown on contaminated soil and indested by the animal	Default of 1.0 considered appropriate
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and incested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
			by the animal	(USEPA 2005)
FL(beef)	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	N/A to rivers
Fuction States	(unitless)	0	swine	N/A to rivers
• L(chicken)	(dimoso)	v	chicken	
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
⊢ <sub>R(beef)</sub>	(unitiess)	1	reaction of contaminanted river water ingested by the con	considered in HHRAP)
F <sub>R(pork)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the swine	Value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
free	(unitless)	0.070	Fish Lipid Content	Default of 0.07 considered appropriate
lipid	(unitiess)	0.070		(USEPA 2005)

# Table D.81 Site Input Parameters for Lower Tooley Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL θ <sub>sw</sub>	(mL water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Z <sub>s</sub>	cm <sup>3</sup> soil) (cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
BD	(g soil/	1.5	Soil bulk density	Value of 2 cm was used in this risk assessment. Default of 1.5 considered appropriate (USEPA 2005)
Fw	cm <sup>3</sup> soil) (unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
Twk	K	281.5	surface Water body temperature (Note Units)	(USEPA 2005) OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
- wk	(unitless)	1 026	Temperature correction factor	Management Default of 1.026 considered appropriate
	(m/s)	0.261		(USEPA 2005)
C <sub>d</sub>	(unitless)	0.0011	Drag coefficient	Default of 0.0011 considered appropriate (UISEPA 2005)
W	(m/s)	3	Average annual wind speed	Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
ρ <sub>w</sub>	(g/cm <sup>3</sup> )	1	Density of water	Default of 1 considered appropriate
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0.0169 considered appropriate
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1.81E-4 considered appropriate
С	(Unitless)	0.02	USLE cover management factor.	(USEPA 2005) Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
PF	(Unitless)	1	USLE supporting practice factor.	1997) Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
Ta	K	281.55	Ambient temperature (Note Units)	Consistent with recommended default. 7.7*C from Environment Canada for Oshawa Station
Psoil	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON, 0 - Off)	1		(USEPA 2005)
Bkg Factor (Air) Bkg Factor (Soil)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Water) Bkg Factor (Sediment)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS ρ <sub>a</sub>	(g/m³)	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m³/	0.00008205	Universal gas constant	(USEPA 2005) R is a constant
CLIMATE	mol-K)			
Р	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
I RO	(cm/yr) (cm/yr)	0 14.4715	Average annual irrigation Average annual surface runoff from pervious areas	Irrigation at a minimal based on type of farming in area Calculated as
		_		GW = Groundwater recharge = 15% Precipitation (till soil)
F	(cm/vr)	61	Average annual evanotranspiration	So: RO = P - (0.15) P - Ev = 0.85 P - Ev National Atlas of Canada provides evapotranspiration (inches/year) Value
	(011, 91)	01		for the Durham region is around 24 inches or 61 cm/year. Reference
				mate/049_50
	OGY (m <sup>2</sup> )	0		N/A for Divoro
A <sub>W(Lake)</sub>	(m²)	5.00E+03	River surface area	Calculation
A <sub>i</sub>	(m²)	5.56E+04	Impervious watershed area receiving COPC deposition	3% considered impervious - CLOCA Tooley creek surveying
AL	(m²)	1.85E+06	Total watershed area receiving COPC deposition	CLOCA
d <sub>z (River)</sub>	(m) (m)	0.3	Total water body depth (River) Total water body depth (Lake)	Estimate N/A for Rivers
$\lambda_z$	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
K	ton/acro	0.26	LISE E prodibility factor	Soils in watershed at consider Silty Clay in areas around site and cand to the
K	ion/acre	0.20		north. For the purposes of this SSRA, silty clay and an average organic content was used to determine a K Factor of 0.26
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
LS	(Unitless)	0.46	USLE length-slope factor.	Calculated using the following equation:
				$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope\_length \div const)^{NN}$
				Where: slope = slope steepness (%) = <b>1.3</b> %
				slope length = length of slope (ft.) or (m) = <b>1292 m</b> constant = <b>72.5</b> Imperial or <b>22.1</b> metric
				NN = see Table below
				Table. NN Values
				<1 = 0.2 1 ≤ Slope < 3 = <b>0.3</b>
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.9	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
	(			interpolate)
				Watershed Area (sq. miles) a (unitless)
				$\begin{array}{c} 2.1 \\ 1 \\ (>0.1 \text{ but } <=1.0) \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.9 \\ 1.1 \\ 1.9 \\ 1.1 \\ 1.9 \\ 1.1 \\ 1.9 \\ 1.1 \\ 1$
				10 (>1.0  but  <=10) 1.4 100 (>10  but  <=100) 1.2 100 (>10  but  <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup> ; 1 sq meter = 3.86102159 × 10-7 sq miles

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	3.70E+06	Average volumetric flow rate through water body (River)	Water Balance Equation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.3	Depth of water column (in River)	Estimate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS(Lake) Measured	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	2	Total Suspended Solids	CLOCA
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate (USEPA 2005)
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	Default of 0.164 considered appropriate
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the	Default of 0.12 considered appropriate
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the	Default of 0.16 considered appropriate
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the	Default of 2.24 considered appropriate (weighted intake of fruit and veg
Yp (veg)	(kg DW/m²)	5.66	plant (productivity) Yield or standing crop biomass of the edible portion of the	Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	Plant (productivity) Yield or standing crop biomass of the edible portion of the	NA it using weighted Yp (produce) (USEPA 2005) Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Plant (productivity) Yield or standing crop biomass of the edible portion of the	NA it using weighted Yp (produce) (USEPA 2005) Default of 0.15 considered appropriate
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	plant (productivity) Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 0.5 considered appropriate
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	plant (productivity) Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 0.8 considered appropriate
VG <sub>ag(forage)</sub>	(unitless)	1	plant (productivity) Empirical correction factor for forage	(USEPA 2005) Default of 1 considered appropriate
	(unitions)	0.5	Empirical correction factor for allogo	(USEPA 2005)
V G <sub>ag(silage)</sub>	(unitiess)	0.5		(USEPA 2005)
TISSUE CONCENTRATION	UPTAKE FACTORS			
Tm <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be eating hav	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx: $Qp_{(torage-game)} = (0.577 * BW^{0.727})/1000$ where $Qp_{(torage-game)} =$ water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
	<i>(</i> , <i>(</i> ), <i>)</i>			(USEPA 2005)
QS <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	(LISEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>		0.4.4	Our stitue function in prosted by the philosophy day.	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day.	BW = body weight (kg) = 3.17 kg (Canada goose)
QW(game)	(L/uay)	3.94	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 60 kg (white-tail deer)
	(	4	Franking of famous and an extension to deall and	
F <sub>(forage)</sub>	(unitiess)	1	ingested by the animal	(USEPA 2005)
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and ingested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
F <sub>L(beef)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	(USEPA 2005) N/A to rivers
F <sub>L(pork)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the swine	N/A to rivers
F <sub>L(chicken)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the chicken	N/A to rivers
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
F <sub>R(beef)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the cow	Value of 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
FR(pork)	(unitiess)	1	swine	value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
4	(unitions)	0.070	animal Fish Lipid Contont	Considered in HHRAP)
T <sub>lipid</sub>	(unitiess)	0.070	FISH LIPIA CONTENT	
				1001772000

# Table D.82 Site Input Parameters for Upper Tooley Creek Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL A	(ml_water/	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
	cm <sup>3</sup> soil)	0.2		
Zs	(cm)	2	Soli mixing zone depth	value of 2 cm was used in this risk assessment.
BD	(g soil/ cm³ soil)	1.5	Soil bulk density	Default of 1.5 considered appropriate (USEPA 2005)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
T <sub>wk</sub>	К	281.5	surrace Water body temperature (Note Units)	OMAFRA, 1996. Best Management Practices: Fish and Wildlife Habitat
	(unitless)	1 026	Temperature correction factor	Management Default of 1 026 considered appropriate
0	(driftess)	1.020		(JSEPA 2005)
U C <sub>d</sub>	(m/s) (unitless)	0.325	Current velocity Drag coefficient	Calculation Default of 0.0011 considered appropriate
	(m/c)	2		(USEPA 2005)
	(11/5)	3	Average annual who speed	Peterborough A (10.8 km/h yearly average)
ρ <sub>w</sub>	(g/cm³)	1	Density of water	Default of 1 considered appropriate (USEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
μ <sub>w</sub>	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	Default of 0.0169 considered appropriate
ща	(q/cm-s)	0.000181	Viscosity of air corresponding to air temperature	(USEPA 2005) Default of 1.81E-4 considered appropriate
		0.00		(USEPA 2005)
C	(Unitiess)	0.02	USLE cover management factor.	1997)
PF	(Unitless)	1	USLE supporting practice factor.	Recommended value for no suporting practice (p.37, RUSELFAC, 1997).
T <sub>a</sub>	К	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
Psoil	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate (USEPA 2005)
Include Deposition?	(1 - ON, 0 - Off)	1		
вкg ⊢actor (Air) Bkg Factor (Soil)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
Bkg Factor (Water) Bkg Factor (Sediment)	(1 - ON, 0 - Off)	0		
FACILITY PARAMETERS		0		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
	(91)	30	combustion)	NEE states a 50 year period.
	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
ρa	(g/m³)	1200	Density of air	Default of 1200 considered appropriate
R	(atm-m <sup>3</sup> /	0.00008205	Universal gas constant	(USEPA 2005) R is a constant
	mol-K)			
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
	(cm/yr)	0	Average annual irrigation	Irrigation at a minimal based on type of farming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
F	(cm/yr)	61		So: $RO = P - (0.15) P - Ev = 0.85 P - Ev$
μ	(Chivyr)	01	Average annual evaporarispiration	for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				http://atlas.nrcan.gc.ca/site/english/maps/archives/4thedition/environment/cli mate/049 50
	007			_
A <sub>W(Lake)</sub>	(m²)	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	3.40E+04	River surface area	Calculation
A <sub>l</sub>	(m²)	2.16E+05	Impervious watershed area receiving COPC deposition	2.5% considered impervious - CLOCA Tooley creek surveying
AL	(m²)	8.65E+06	Total watershed area receiving COPC deposition	CLOCA Tooley creek surveying
dz (River)	(m) (m)	0.2	Total water body depth (River)	Estimate N/A for Rivers
λ <sub>z</sub>	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
				(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				content was used to determine a K Factor of 0.26.
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
LS	(Unitless)	0.59	USLE length-slope factor.	Calculated using the following equation:
				$LS = [0.065 + 0.0456(slope) + 0.006541(slope)^{2}] \times (slope\_length \div const)^{NN}$
				Where:
				slope = slope steepness (%) = 1.176 % slope length = length of slope (ft.) or (m) = 3580 m
				constant = 72.5 Imperial or 22.1 metric
				NN = see Table below
				Table. NN Values
				$1 \le \text{Slope} < 3 = 0.3$
				3 ≤ Slope < 5 = 0.4 ≥ 5 = 0.5
				Universal Soil Loss Eduction (USLE) East-bast
				Universal Soil Loss Equation (USLE) Factsheet. http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.4	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
				Interpolate)
				Watershed Area (sq. miles) a (unitless)
				1 (>0.1 but <=1.0) 1.9
				10 (>1.0 but <=10) 1.4 100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>
b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
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Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	3.07E+06	Average volumetric flow rate through water body (River)	water balance equation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.2	Depth of water column (in River)	estimate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS <sub>(River) Measured</sub>	(mg/L)	2	Total Suspended Solids	CLOCA WQ monitoring of headwaters of black Creek
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Default of 0.982 considered appropriate if calculating veg separately NA if using weighted Bp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate (USEPA 2005)
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate (USEPA 2005)
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate (USEPA 2005)
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.164 considered appropriate (USEPA 2005)
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.12 considered appropriate (USEPA 2005)
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the edible portion of the ith plant group	Default of 0.16 considered appropriate (USEPA 2005)
Yp (produce)	(kg DW/m²)	2.24	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 2.24 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Yp (veg)	(kg DW/m²)	5.66	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 5.66 considered appropriate if calculating veg separately NA if using weighted Yp (produce) (USEPA 2005)
Yp (fruit)	(kg DW/m²)	0.252	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.252 considered appropriate if calculating fruit separately NA if using weighted Yp (produce) (USEPA 2005)
Yp <sub>(grass)</sub>	(kg DW/m²)	0.15	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.15 considered appropriate (USEPA 2005)
Yp <sub>(hay)</sub>	(kg DW/m²)	0.5	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.5 considered appropriate (USEPA 2005)
Yp <sub>(silage)</sub>	(kg DW/m²)	0.8	Yield or standing crop biomass of the edible portion of the plant (productivity)	Default of 0.8 considered appropriate (USEPA 2005)
VG <sub>ag(forage)</sub>	(unitless)	1	Empirical correction factor for forage	Default of 1 considered appropriate (USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Default of 0.5 considered appropriate (USEPA 2005)
	UPTAKE FACTORS			
I M <sub>pasture</sub>	(months)	6	Number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be eating hay	Considered appropriate for Durham Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate (USEPA 2005)
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate (USEPA 2005)
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook (USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				$Qp_{(torage-game)} = (0.577 * BW ^{0.727})/1000$ where $Qp_{(torage-game)} =$ water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Default of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Default of 4.1 considered appropriate (USEPA 2005)
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
	<i>(</i> , <i>(</i> ), <i>)</i>			(USEPA 2005)
QS <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	(LISEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>		0.4.4	Our stitue function in prosted by the philosophy day.	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day.	BW = body weight (kg) = 3.17 kg (Canada goose)
QW(game)	(L/uay)	3.94	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 60 kg (white-tail deer)
	(	4	Franking of famous and an extension to deall and	
F <sub>(forage)</sub>	(unitiess)	1	ingested by the animal	(USEPA 2005)
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and ingested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
F <sub>L(beef)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	(USEPA 2005) N/A to rivers
F <sub>L(pork)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the swine	N/A to rivers
F <sub>L(chicken)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the chicken	N/A to rivers
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
F <sub>R(beef)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the cow	Value of 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
FR(pork)	(unitiess)	1	swine	value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
4	(unitions)	0.070	animal Fish Lipid Contont	Considered in HHRAP)
T <sub>lipid</sub>	(unitiess)	0.070	FISH LIPIA CONTENT	Ulisepa 2005)
				10001772000/

Table D.83 Site Input Parameters for Westside Watershed

Parameter	Units	Value	Parameter Description	Rationale
GENERAL				
$\Theta_{\sf sw}$	(mL water/ cm <sup>3</sup> soil)	0.2	Soil volumetric water content	Default of 0.2 considered appropriate (USEPA 2005)
Zs	(cm)	2	Soil mixing zone depth	Will depend on activities in overall watershed (2 (untilled) 20 - 20 default). A
PD	(a soil/	15	Soil bulk donaity	value of 2 cm was used in this risk assessment.
00	cm <sup>3</sup> soil)	1.0	Soli buik density	Deradit of 1.5 considered appropriate (USEF A 2003)
Fw	(unitless)	0.6	Fraction of COPC wet deposition that adheres to plant	Recommended value for cations (such as metals) and organics
T	к	282.5	surface Water body temperature (Note Units)	(USEPA 2005) OMAERA, 1996, Best Management Practices: Fish and Wildlife Habitat
· wk		10110	······	Management
θ	(unitless)	1.026	Temperature correction factor	Default of 1.026 considered appropriate
u	(m/s)	0.212	Current velocity	Calculation
C <sub>d</sub>	(unitless)	0.0011	Drag coefficient	Default of 0.0011 considered appropriate
W	(m/s)	3	Average annual wind speed	(USEPA 2005) Environment Canada Climate Normals 1971 - 2000 - nearest wind station -
				Peterborough A (10.8 km/h yearly average)
$\rho_w$	(g/cm³)	1	Density of water	Default of 1 considered appropriate (LISEPA 2005)
k	(unitless)	0.4	von Karman's constant	Default of 0.4 considered appropriate
	(g/cm-s)	0.0169	Viscosity of water correponding to water temperature	(USEPA 2005) Default of 0 0169 considered appropriate
μw	(9,0			(USEPA 2005)
μ <sub>a</sub>	(g/cm-s)	0.000181	Viscosity of air corresponding to air temperature	Default of 1.81E-4 considered appropriate
С	(Unitless)	0.02	USLE cover management factor.	Recommended value for pasture area in Ontario Region (p.98, RUSELFAC,
	(1 1 - 11)	4		1997)
PF	(Unitless)	1	USLE supporting practice factor.	Consistent with recommended default.
Ta	K	281.55	Ambient temperature (Note Units)	7.7*C from Environment Canada for Oshawa Station
ρ <sub>soil</sub>	(g/cm <sup>3</sup> )	2.7	Solids particle density	Default of 2.7 considered appropriate
Include Deposition?	(1 - ON: 0 - Off)	1		(USEPA 2005)
Bkg Factor (Air)	(1 - ON, 0 - Off)	0		
Bkg Factor (Soil)	(1 - ON, 0 - Off)	0		
вкg ⊢actor (Water) Bkg Factor (Sediment)	(1 - ON, 0 - Off) (1 - ON, 0 - Off)	0		
FACILITY PARAMETERS		~		
T <sub>1</sub>	(yr)	0	Time period at the beginning of combustion	Combustion assumed to start at time 0
tD	(yr)	30	Time period over which deposition occurs (time period of combustion)	RFP states a 30 year period.
T <sub>2</sub>	(yr)	30	Length of exposure duration	Assumed no averaging Most conservative.
CONSTANTS				
ρ <sub>a</sub>	(g/m³)	1200	Density of air	Userault of 1200 considered appropriate (USEPA 2005)
R	(atm-m <sup>3</sup> /	0.00008205	Universal gas constant	R is a constant
	mol-K)			
P	(cm/yr)	88.79	Average annual precipitation	Environment Canada climate normals Oshawa - 887.9 yearly precipatation
1	(cm/yr)	0	Average appual irrigation	Irrigation at a minimal based on type of farming in area
RO	(cm/yr)	14.4715	Average annual surface runoff from pervious areas	Calculated as
				GW = Groundwater recharge = 15% Precipitation (till soil)
				So: RO = P - (0.15) P - Ev = 0.85 P - Ev
Ev	(cm/yr)	61	Average annual evapotranspiration	National Atlas of Canada provides evapotranspiration (inches/year). Value
				for the Durham/York regions are around 24 inches or 61 cm/year. Reference
				mate/049_50
	(m <sup>2</sup> )	0	Lake surface area	N/A for Rivers
A <sub>W(River)</sub>	(m²)	9.00E+03	River surface area	Calculation based on measurements
A	(m²)	5.73E+05	Impervious watershed area receiving COPC deposition	10% considered impervious - 55% residential/industrial
A	(m²)	5.73E+06	Total watershed area receiving COPC deposition	CLOCA
d <sub>z (River)</sub>	(m)	0.3	Total water body depth (River)	Estimate
d <sub>z (Lake)</sub>	(m)	0	Total water body depth (Lake)	N/A for Rivers
λz	(unitless)	4	Dimensionless viscous sublayer thickness	Default of 4 considered appropriate for lakes (N/A to rivers and streams)
				(USEPA 2005)
К	ton/acre	0.26	USLE erodibility factor	Soils in watershed at consider Silty Clay in areas around site and sand to the
				north. For the purposes of this SSRA, silty clay and an average organic content was used to determine a K Factor of 0.26
RF	1/yr	90	USLE rainfall (or erositivity) factor	R factor for Durham, Hastings, Northumberland, Peterborough, Victoria
10	(Unitless)	0.50	LISE E length-slope factor	http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#tab1
LO	(Onitiess)	0.50	USLE lengin-slope lactor.	LS = $[0.065 + 0.0456(slope) + 0.006541(slope)^2] x (slope length ÷ const)^{NN}$
				Where: $(9/2) = 1.1.9$
				slope length = length of slope (ft.) or (m) = $2425 \text{ m}$
				constant = 72.5 Imperial or 22.1 metric
				NN = see ladie below
				Table. NN Values
				<1 = 0.2 1 < Slope = 2 = 0.2
				$3 \le \text{Slope} < 5 = 0.4$
				≥ 5 = 0.5
				Universal Soil Loss Equation (USLE) Factsheet.
				http://www.omafra.gov.on.ca/english/engineer/facts/00-001.htm#equation
а	(unitless)	1.4	Empirical intercept coefficient	Based on watershed area according to the following table (Do NOT
				interpolate)
				Watershed Area (sq. miles) a (unitless)
				0.1 $2.11 (>0.1 but <=1.0) 1.0$
				1 (>0.1  but <= 1.0) 1.9 10 (>1.0 but <= 10) 1.4
				100 (>10 but <=100) 1.2
				1000 (>100) 0.6
				Note: 1 sq. mile = 2.59E+06 m <sup>2</sup>

b	(unitless)	0.125	Empirical slope coefficient	Default of 0.125 considered appropriate (USEPA 2005)
Vf <sub>x (Lake)</sub>	(m³/yr)	0	Average volumetric flow rate through water body (Lake)	N/A for Rivers
Vf <sub>x (River)</sub>	(m³/yr)	2.01E+06	Average volumetric flow rate through water body (River)	Water Balance Equation
d <sub>wc (Lake)</sub>	(m)	0	Depth of water column (in Lake)	N/A for Rivers
d <sub>wc (River)</sub>	(m)	0.3	Depth of water column (in River)	Estimate
d <sub>bs (Lake)</sub>	(m)	0	Depth of upper benthic sediment layer (in Lake).	N/A for Rivers
d <sub>bs (River)</sub>	(m)	0.03	Depth of upper benthic sediment layer (in River).	The US EPA recommended range is from 0.01 to 0.05 m, with a recommended value of 0.03 m.
C <sub>BS</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
D <sub>ss(Lake)</sub>	(m/yr)	0	Suspended solids deposition rate	N/A for Rivers
()	· · · ·			
D <sub>ss(River)</sub>	(m/yr)	0	Suspended solids deposition rate	Measured values of TSS available for streams therefore D <sub>SS</sub> was not required.
TSS <sub>(Lake) Measured</sub>	(mg/L)	0	Total Suspended Solids	N/A for Rivers
TSS(River) Measured	(mg/L)	2	Total Suspended Solids	CLOCA WQ monitoring of headwaters of black Creek
ρ <sub>s</sub>	(kg/L)	2.65	Bed sediment density	Default of 2.65 considered appropriate (USEPA 2005)
OC <sub>sed</sub>	(unitless)	0.07	Fraction of organic carbon in bottom sediment	Assumption based on Lake Ontario sediments
VEGETATION UPTAKE FAC	TORS			
Rp (produce)	(unitless)	0.39	Interception fraction of the edible portion of plant	Default of 0.39 considered appropriate (weighted intake of fruit and veg based on human consumption) (USEPA 2005)
Rp (veg)	(unitless)	0.982	Interception fraction of the edible portion of plant	Detault of 0.982 considered appropriate if calculating veg separately NA if using weighted Rp (produce) (USEPA 2005)
Rp (fruit)	(unitless)	0.053	Interception fraction of the edible portion of plant	Default of 0.053 considered appropriate if calculating fruit separately NA if using weighted Rp (produce) (USEPA 2005)
Rp <sub>(forage)</sub>	(unitless)	0.5	Interception fraction of the edible portion of plant	Default of 0.5 considered appropriate (USEPA 2005)
Rp <sub>(silage)</sub>	(unitless)	0.46	Interception fraction of the edible portion of plant	Default of 0.46 considered appropriate
kp	(1/yr)	18	Plant surface loss coefficient	Default of 18 considered appropriate
Тр	(yr)	0.164	Length of plant exposure to deposition per harvest of the	Default of 0.164 considered appropriate
Tp <sub>(forage)</sub>	(yr)	0.12	Length of plant exposure to deposition per harvest of the	Default of 0.12 considered appropriate
Tp <sub>(silage)</sub>	(yr)	0.16	Length of plant exposure to deposition per harvest of the	(USEPA 2005) Default of 0.16 considered appropriate
Yp (produce)	(kg DW/m²)	2.24	edible portion of the ith plant group Yield or standing crop biomass of the edible portion of the	(USEPA 2005) Default of 2.24 considered appropriate (weighted intake of fruit and veg
Yp (veg)	(kg DW/m²)	5.66	plant (productivity) Yield or standing crop biomass of the edible portion of the	based on human consumption) (USEPA 2005) Default of 5.66 considered appropriate if calculating veg separately
Yp (fruit)	(kg DW/m²)	0.252	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.252 considered appropriate if calculating fruit separately
Yp <sub>(grass</sub> )	(kg DW/m²)	0.15	plant (productivity) Yield or standing crop biomass of the edible portion of the	NA if using weighted Yp (produce) (USEPA 2005) Default of 0.15 considered appropriate
Yn	(kg DW/m <sup>2</sup> )	0.5	plant (productivity)	(USEPA 2005)
Vp	(kg D)///m²)	0.8	plant (productivity)	(USEPA 2005)
VC	(kg DW/III-)	0.0	plant (productivity)	(USEPA 2005)
VG <sub>ag(forage)</sub>	(unitiess)	1		(USEPA 2005)
VG <sub>ag(silage)</sub>	(unitless)	0.5	Empirical correction factor for silage	Uefault of 0.5 considered appropriate (USEPA 2005)
		0	Number of months participation and the state	Considered oppropriate for Durborn Danier
I M <sub>pasture</sub>	(months)	6	number of months per year a cow is set out to pasture and eating grass; the rest of the year is assumend to be eating hav	Considered appropriate for Durnam Region
Qp <sub>(forage-beef)</sub>	(kg DW plant/day)	8.8	Quantity of forage eaten by the animal per day	Default of 8.8 considered appropriate (USEPA 2005)
Qp <sub>(silage-beef)</sub>	(kg DW plant/day)	2.5	Quantity of silage eaten by the animal per day	Default of 2.5 considered appropriate
Qp <sub>(grain-beef)</sub>	(kg DW plant/day)	0.47	Quantity of grain eaten by the animal per day	Default of 0.47 considered appropriate
Qp <sub>(forage-game)</sub>	(kg DW plant/day)	1.72	Quantity of forage eaten by the animal per day	Estimated using equation 3-9 from the Wildlife Exposure Factors Handbook
				(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does: http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer.a spx:
				Qp <sub>(forage-game)</sub> = (0.577 * BW <sup>0.727</sup> )/1000
				where
				Qp <sub>(torage-game)</sub> = water ingestion rate (kg DW/day) BW = body weight (g) = 60,000 g (white-tail deer)
	(h. D)***	10.0		
Qp <sub>(forage-milk)</sub>	(kg DW/day)	13.2	Quantity of forage eaten by the dairy cattle per day	Uerauit of 13.2 considered appropriate (USEPA 2005)
Qp <sub>(silage-milk)</sub>	(kg DW/day)	4.1	Quantity of silage eaten by the dairy cattle per day	Detault of 4.1 considered appropriate (USEPA 2005)
Qp <sub>(grain-milk)</sub>	(kg DW/day)	3	Quantity of grain eaten by the dairy cattle per day	Default of 3.0 considered appropriate (USEPA 2005)

Qp <sub>(silage-pork)</sub>	(kg DW/day)	1.4	Quantity of silage eaten by the swine per day	Default of 1.4 considered appropriate (USEPA 2005)
Qp <sub>(grain-pork)</sub>	(kg DW/day)	3.3	Quantity of grain eaten by the swine per day	Default of 3.3 considered appropriate (USEPA 2005)
Qp <sub>(grain-chicken)</sub>	(kg DW plant/day)	0.2	Quantity of grain eaten by the chicken per day	Default of 0.2 considered appropriate (USEPA 2005)
$Qs_{(beef)}$	(kg/day)	0.5	Quantity of soil eaten by the animal each day	Default of 0.5 considered appropriate (USEPA 2005)
Qs <sub>(game)</sub>	(kg/day)	0.04	Quantity of soil eaten by the animal each day	White-tail deer from EcoRAM model
Qs <sub>(milk)</sub>	(kg/day)	0.4	Quantity of soil eaten by the dairy cattle each day	Default of 0.4 considered appropriate
	<i>(</i> , <i>(</i> ), <i>)</i>			(USEPA 2005)
QS <sub>(pork)</sub>	(kg/day)	0.37	Quantity of soil eaten by the swine day	(LISEPA 2005)
Qs <sub>(chicken)</sub>	(kg/day)	0.022	Quantity of soil eaten by the chicken each day	Default of 0.022 considered appropriate (USEPA 2005)
Qw <sub>(beef)</sub>	(L/day)	38.53	Quantity of water ingested by the cow each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 755 kg (domestic cattle)
Qw <sub>(pork)</sub>	(L/day)	5.08	Quantity of water ingested by the swine each day	Estimated using equation 3-17 from the Wildlife Exposure Factors Handboo (USEPA, 1993):
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
<u> </u>		0.4.4	Our stitue function in prosted by the philosophy day.	BW = body weight (kg) = 79.4 kg (domestic hog)
QW(chicken)	(L/day)	0.14	Quantity of water ingested by the chicken each day	(USEPA, 1993):
				$Qw = 0.059 * BW^{0.67}$
				where
				Qw = water ingestion rate (L/day)
0	(L/dov)	2.04	Quantity of water ingested by the game animal each day.	BW = body weight (kg) = 3.17 kg (Canada goose)
QW(game)	(L/uay)	3.94	Quantity of water ingested by the game animal each day	(USEPA, 1993) and Alberta Fish and Wildlife suggested weight for does:
				http://www.srd.gov.ab.ca/fishwildlife/livingwith/huntingalberta/whitetaileddeer
				spx:
				Qw = 0.099 * BW <sup>0.90</sup>
				where
				Qw = water ingestion rate (L/day)
				BW = body weight (kg) = 60 kg (white-tail deer)
	(	4	Franking of famous and an extension to deall and	
F <sub>(forage)</sub>	(unitiess)	1	ingested by the animal	(USEPA 2005)
F <sub>(silage)</sub>	(unitless)	1	Fraction of silage grown on contaminated soil and ingested by the animal	Default of 1.0 considered appropriate (USEPA 2005)
F <sub>(grain)</sub>	(unitless)	1	Fraction of grain grown on contaminated soil and ingested	Default of 1.0 considered appropriate
F <sub>L(beef)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the cow	(USEPA 2005) N/A to rivers
F <sub>L(pork)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the swine	N/A to rivers
F <sub>L(chicken)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the chicken	N/A to rivers
F <sub>L(game)</sub>	(unitless)	0	Fraction of contaminanted lake water ingested by the animal	N/A to rivers
F <sub>R(beef)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the cow	Value of 1.0 considered conservative (Note: water ingestion by cow not considered in HHRAP)
FR(pork)	(unitiess)	1	swine	value of 1.0 considered conservative (Note: water ingestion by pork not considered in HHRAP)
F <sub>R(chicken)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the chicken	Value of 1.0 considered conservative (Note: water ingestion by chicken not considered in HHRAP)
F <sub>R(game)</sub>	(unitless)	1	Fraction of contaminanted river water ingested by the	Value of 1.0 considered conservative (Note: water ingestion by game not
4	(unitions)	0.070	animal Fish Lipid Contont	Considered in HHRAP)
T <sub>lipid</sub>	(unitiess)	0.070	FISH LIPIA CONTENT	Ulisepa 2005)
				10001772000/