

Table 8 Soil quality benchmarks^I						
Substance	Ontario Guideline for Use at Contaminated Sites (Surface Soil) ^{II} (mg/kg)				Canadian Environmental Quality Criteria and Guidelines ^{III} (mg/kg)	
	Potable Groundwater		Nonpotable Groundwater			
	Agricultural/ Residential ^{IV}	Industrial/ Commercial	Residential	Industrial/ Commercial	Agricultural/ Residential ^{IV}	Industrial/ Commercial ^V
Acenaphthene	15	15	1000	1300		
Acenaphthylene	100	130	100	840		
Acetone	3.5	3.5	3.8	3.8		
Aldrin	0.05	0.05	0.05	0.05		
Anthracene	28	28	28	28		
Antimony	13	40-44	13	40-44	20	40
Arsenic	20-25	40-50	20-25	40-50	12	12
Barium	750-1000	1500-2000	750-1000	1500-2000	(A)750 (R)500	2000
Benzene	0.24	0.24	5.3-25	5.3-25		
Surface (10 ⁻⁵ Incremental Risk)					(AC)0.03 (AF)0.0068 (RC)0.03 (RF)0.0068	(CC)0.03 (CF)0.0068 (IC)0.03 (IF)0.0068
Subsoil (10 ⁻⁵ Incremental Risk)					(AC)0.03 (AF)0.0068 (RC)0.03 (RF)0.0068	(CC)0.03 (CF)0.0068 (IC)0.03 (IF)0.0068
Surface (10 ⁻⁶ Incremental Risk)					(AC)0.0095 (AF)0.0068 (RC)0.0095 (RF)0.0068	(CC)0.03 (CF)0.0068 (IC)0.03 (IF)0.0068
Subsoil (10 ⁻⁶ Incremental Risk)					(AC)0.01 (AF)0.0068 (RC)0.011 (RF)0.0068	(CC)0.03 (CF)0.0068 (IC)0.03 (IF)0.0068
Benzo(a)anthracene	6.6	6.6	40	40	(A)0.1 (R)1	10
Benzo(b)fluoranthene	12	18	12	19	(A)0.1 (R)1	10
Benzo(k)fluoranthene	12	18	12	19	(A)0.1 (R)1	10
Benzo(g,h,i)perylene	40	40	40	40		
Benzo(a)pyrene	1.2	1.9	1.2	1.9	(A)0.1 (R)0.7	0.7
Beryllium	1.2	1.2	1.2	1.2	4	8
Biphenyl, 1,1-	0.89	0.89	4.3	4.3		
Bis(2-chloroethyl) ether	0.66	0.66	0.66	0.66		
Bis(2-chloroisopropyl) Ether	0.66	0.66	0.82-1.9	0.82-2.6		
Bis(2-ethylhexyl) phthalate	100	100	130	330		
Boron (available) ^{VI}	1.5	2	1.5	2	(A)2	

Bromodichloro-methane	0.12	0.12	14	25		
Bromoform	0.11	0.11	2.3-14	2.3-14		
Bromomethane	0.061-0.38	0.061-0.38	0.061-0.38	0.061-0.38		
Cadmium	(A)3-4 (R)12	12	12	12	(A)1.4 (R)10	22
Carbon tetrachloride	0.1-0.64	0.1-0.64	0.1-0.64	0.1-0.64	(A)0.1 (R)5	50
Chlordane	0.29	0.29	0.29	0.29		
Chloroaniline, <i>p</i> -	1.3	1.3	1.3	1.3		
Chlorobenzene	2.4	2.4	8-30	8-30	(A)0.1 (R)1	10
Chloroform	0.13	0.13	0.79-4.9	0.79-4.9	(A)0.1 (R)5	50
Chlorophenol, 2-	0.1	0.1	10	10	(A)0.05 (R)0.5	5
Chromium (total)	750-1000	750-1000	750-1000	750-1000	64	87
Chromium (VI)	8-10	8-10	8-10	8-10	0.4	1.4
Chrysene	12	17	12	19		
Cobalt	40-50	80-100	40-50	80-100	(A)40 (R)50	300
Copper	(A)150-200 (R)225-300	225-300	225-300	225-300	63	91
Cresol					(A)0.1 (R)1	10
Cyanide	100	100	100	100	0.9	8
DDD	2.2	3.5	2.2	3.5		
DDE	1.6	2.4	1.6	2.4		
DDT	1.6	2	1.6	2	0.7	12
Dibenzo(a,h) anthracene	1.2	1.9	1.2	1.9	(A)0.1 (R)1	10
Dibromochloro-methane	0.09	0.09	10	18		
Dichlorobenzene, 1,2-	0.88	0.88	30	30	(A)0.1 (R)1	10
Dichlorobenzene, 1,3-	30	30	30	30	(A)0.1 (R)1	10
Dichlorobenzene, 1,4-	0.32	0.32	30	30	(A)0.1 (R)1	10
Dichlorobenzidine, 3,3-	1.3	1.3	1.3	1.3		
Dichloroethane 1,1-	3	3	22-100	22-140	(A)0.1 (R)5	50
Dichloroethane, 1,2-	0.022-0.05	0.022-0.05	0.022-0.14	0.022-0.14	(A)0.1 (R)5	50
Dichloroethene, 1,1-					(A)0.1 (R)5	50
Dichloroethene, 1,2-					(A)0.1 (R)5	50
Dichloroethylene, 1,1-	0.0024- 0.015	0.0024- 0.015	0.0024- 0.015	0.0024- 0.015		
Dichloroethylene, cis - 1,2-	2.3	2.3	2.3	2.3		
Dichloroethylene, trans- 1,2-	4.1	4.1	4.1	4.1		
Dichloromethane					(A)0.1 (R)5	50

Dichlorophenol, 2,4-	0.3	0.3	10	10	(A)0.05 (R)0.5	5
Dichloropropane, 1,2	0.019-0.12	0.019-0.12	0.019-0.12	0.019-0.12	(A)0.1 (R)5	50
Dichloropropene, 1,3-	6.6-40mg/g	6.6-40mg/g	6.6-41mg/g	6.6-41mg/g	(A)0.1 (R)5	50
Dieldrin	0.05	0.05	0.05	0.05		
Diethyl phthalate	0.71	0.71	0.71	0.71		
Diisopropanolamine					180	180
Dimethylphenol, 2,4-	0.94	0.94	140	140	(A)0.1 (R)1	10
Dimethyl phthalate	0.7	0.7	0.7	0.7		
Dinitrophenol, 2,4-	0.2	0.2	4.1	4.1	(A)0.1 (R)1	10
Dinitrotoluene, 2,4-	0.66	0.66	1.1	1.8		
Dioxin/Furan (ng TEQ/g soil)	(A)0.01 (R)1	1	1	1	(A)0.01mg/g (R)1mg/g	
Endosulfan	0.18	0.18	0.29	0.29		
Endrin	0.05	0.05	0.05	0.05		
Ethylbenzene	0.28	0.28	290-500	290-1000		
Surface					(AC)0.082 (AF)0.018 (RC)0.082 (RF)0.018	(CC)0.082 (CF)0.018 (IC)0.082 (IF)0.018
Subsoil					(AC)0.082 (AF)0.018 (RC)0.082 (RF)0.018	(CC)0.082 (CF)0.018 (IC)0.082 (IF)0.018
Ethylene dibromide	5.6-10mg/g	5.6-12mg/g	5.6-10mg/g	5.6-20mg/g		
Ethylene glycol					960	960
Fluoranthene	40	40	40	40		
Fluorene	340	340	350	350		
Fluoride (total)					(A)200 (R)400	2000
Heptachlor	0.084-0.12	0.084-0.15	0.084-0.12	0.084-0.15		
Heptachlor epoxide	0.06	0.09	0.06	0.09		
Hexachlorobenzene	0.46	0.76	0.46	0.76	(A)0.05 (R)2	10
Hexachlorobutadiene	0.38-2.2	0.38-2.2	0.38-2.4	0.38-2.4		
Hexachlorocyclo-hexane (Lindane)	0.41	0.49	0.41	0.49	(A)0.01	
Hexachloroethane	3.8-6.3	3.8-8.5	3.8-6.3	3.8-13		
Indeno(1,2,3-c,d) pyrene	12	19	12	19	(A)0.1 (R)1	10
Lead	200	1000	200	1000	(A)70 (R)140	(C)260 (I)600
Mercury	10	10	10	10	6.6	(C)24 (I)50
Methoxychlor	4	4	4	4		
Methyl- <i>t</i> -butyl ether	5.7	5.7	100	120-410		
2-Methyl 4,6 dinitrophenol					(A)0.1 (R)1	10
Methylene chloride	1.1	1.1	120	140-200	(A)0.1 (R)5	50

Methyl ethyl ketone	0.27	0.27	38	38		
Methyl isobutyl ketone	0.48	0.48	58-69	58-69		
Methyl mercury	6.8 ^{VII}	10 ^{VII}	6.8 ^{VIII}	10 ^{VIII}		
Methylnaphthalene, 2-	1.2	1.2	280-1000	280-1600		
Molybdenum	(A)5 (R)40	40	40	40	(A)5 (R)10	40
Naphthalene	4.6	4.6	40	40	(A)0.1 (R)0.6	22
Nickel	150-200	150-200	150-200	150-200	50	50
Nitrophenol					(A)0.1 (R)1	10
Nonylphenol (and its ethyloxylates)					5.7	14
Pentachlorobenzene					(A)0.05 (R)2	10
Pentachlorophenol	5	5	5	5	7.6	7.6
Petroleum hydrocarbons (gas/diesel)	100	100	1000	1000-2000		
Petroleum hydrocarbons (heavy oils)	1000	1000	1000	5000		
Phenanthrene	40	40	40	40	(A)0.1 (R)5	50
Phenol	40	40	40	40	3.8	3.8
Phenolic compounds, nonchlorinated					(A)0.1 (R)1	10
Polychlorinated biphenyls (PCBs)	(A)0.5 (R)5	25	5	25	(A)0.5 (R)1.3	33
Polychlorinated dibenzo- <i>p</i> -dioxins/ dibenzofurans (PCDD/Fs)					4 ngTEQ/kg	4 ngTEQ/kg
Pyrene	250	250	250	250	(A)0.1 (R)10	100
Quinoline					(A)0.1	
Selenium	(A)2 (R)10	10	10	10	1	3.9
Silver	20-25	40-50	20-25	40-50	20	40
Styrene	1.2-1.7	1.2-1.7	1.2-7.7	1.2-7.7	(A)0.1 (R)5	50
Sulpholane					0.8	0.8
Sulphur (elemental)					(A)500	
Tetrachlorobenzene isomers (each)					(A)0.05 (R)2	10
Tetrachloroethane, 1,1,1,2-	0.019-0.12	0.019-0.12	0.019-0.12	0.019-0.12		
Tetrachloroethane, 1,1,2,2-	0.01	0.01	0.037-0.23	0.037-0.23	(A)0.1 (R)5	50
Tetrachloroethene					(A)0.1 (R)0.2	(C)0.5 (I)0.6
Tetrachloroethylene	0.45	0.45	0.45	0.45	(A)0.1 (R)0.2	(C)0.5 (I)0.6
Tetrachlorophenols					(A)0.05 (R)0.5	5
Thallium	4.1	32	4.1	32	1	1

Thiophene					(A)0.1	
Tin					(A)5 (R)50	300
Toluene	2.1	2.1	34-150	34-150		
Surface					(AC)0.37 (AF)0.08 (RC)0.37 (RF)0.08	(CC)0.37 (CF)0.08 (IC)0.37 (IF)0.08
Subsoil					(AC)0.37 (AF)0.08 (RC)0.37 (RF)0.08	(CC)0.37 (CF)0.08 (IC)0.37 (IF)0.08
Trichlorobenzene, 1,2,3-					(A)0.05 (R)2	10
Trichlorobenzene, 1,2,4-	30	30	30	30	(A)0.05 (R)2	10
Trichlorobenzene, 1,3,5-					(A)0.05 (R)2	10
Trichloroethane, 1,1,1-	26-34	26-34	26-34	26-34	(A)0.1 (R)5	50
Trichloroethane, 1,1,2-	0.28	0.28	2.3	3.1	(A)0.1 (R)5	50
Trichloroethene					(A)0.1 (R)3	31
Trichloroethylene	1.1-3.9	1.1-3.9	1.1-3.9	1.1-3.9	(A)0.1 (R)3	31
Trichlorophenol, 2,4,5-	3.2	3.2	10	10	(A)0.05 (R)0.5	5
Trichlorophenol, 2,4,6-	0.66	0.66	10	10	(A)0.05 (R)0.5	5
Vanadium	200-250	200-250	200-250	200-250	130	130
Vinyl chloride	3-7.5	3-7.5	3-7.5	3-7.5		
Xylenes	25	25	34-210	34-210		
Surface					(AC)11 (AF)2.4 (RC)11 (RF)2.4	(CC)11 (CF)2.4 (IC)11 (IF)2.4
Subsoil					(AC)11 (AF)2.4 (RC)11 (RF)2.4	(CC)11 (CF)2.4 (IC)11 (IF)2.4
Zinc	600-800	600-800	600-800	600-800	200	360

¹All values in milligrams per kilogram (mg/kg) unless otherwise indicated. Please note that mg/kg is equivalent to µg/g. Where a range is indicated, the different numbers may apply to different types of soil (please refer to the appropriate guidelines for more information).

^{II} Ontario Ministry of Environment and Energy, "Guideline for Use at Contaminated Sites in Ontario," Appendix 2, Tables A & B, February 1997, Appendix revised September 2002, [Hhttp://www.ene.gov.on.ca/envision/gp/3161e01_1.pdf](http://www.ene.gov.on.ca/envision/gp/3161e01_1.pdf).

^{III} Canadian Council of Ministers of the Environment, “Canadian Environmental Quality Guidelines,” Summary Table, Update 2002, Hhttp://www.ccme.ca/assets/pdf/e1_06.pdfH.

^{IV} (A) indicates agricultural land and (R) indicates residential land if the values for these types of land differ. In some cases, a value may exist for only one of the two (for example, boron) and is specified by the appropriate letter. (AC) indicates agricultural land with coarse soil, (AF) indicates agricultural land with fine soil, (RC) indicates residential land with coarse soil, and (RF) indicates residential land with fine soil.

^V (I) indicates industrial land and (C) commercial land if the values for these two types of land differ. (CC) indicates commercial land with coarse soil, (CF) indicates commercial land with fine soil, (IC) indicates industrial land with coarse soil, and (IF) indicates industrial land with fine soil.

^{VI} Boron value based on hot water extract.

^{VII} Only when mercury criterion exceeded.

^{VIII} Only if mercury criterion exceeded.