

**Atlantic RBCA - Human Health-Based Tier II Pathway-Specific Standards (PSS) for Soil - Commercial Land Use (mg/kg)**

Land Use	Commercial										
	Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater			Off-site Migration Check	
		Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse	Reference	Fine / Coarse
<b>Inorganic Parameters</b>											
Aluminum	15 400	USEPA, 2019 [5]	-	-	-	-	-	-	-	-	-
Antimony	7.5	MOECC, 2011	-	-	-	-	-	-	-	-	-
Arsenic	31	CCME [4]	-	-	-	10	10	BC CSR Schedule 3.1	-	-	-
Barium	10 000	CCME	-	-	-	350	350	BC CSR Schedule 3.1	96 000	CCME	-
Beryllium	110	CCME	-	-	-	1 [10]	1 [10]	BC CSR Schedule 3.1	1100	CCME	-
Boron (Total)	4300	MOECC, 2011	-	-	-	-	-	-	-	-	-
Boron (mg/L in saturated paste extract)	11 000	AEP, 2019	-	-	-	65	118	AEP, 2019	110 000	AEP, 2019	-
Cadmium	49	CCME	-	-	-	1 [10]	1 [10]	BC CSR Schedule 3.1	-	-	-
Chromium (hexavalent)	160	MOECC, 2011	-	-	-	60	60	BC CSR Schedule 3.1	-	-	-
Chromium (total)	630	CCME	-	-	-	>1 000 000	>1 000 000	BC CSR Schedule 3.1	-	-	-
Cobalt	22	MOECC, 2011	-	-	-	25	25	BC CSR Schedule 3.1	-	-	-
Copper	4000	CCME	-	-	-	250 [10]	250 [10]	BC CSR Schedule 3.1	-	-	-
Cyanide	110	CCME	-	-	-	6.5	6.5	BC CSR Schedule 3.1	-	-	-
Iron	11 000	USEPA, 2019 [5]	-	-	-	-	-	-	-	-	-
Lead	260	CCME	-	-	-	120	120	BC CSR Schedule 3.1	-	-	-
Manganese	360	USEPA, 2019 [5]	-	-	-	2000	2000	BC CSR Schedule 3.1	-	-	-
Mercury (total)	24	CCME	-	-	-	-	-	-	-	-	-
Molybdenum	110	MOECC, 2011	-	-	-	15	15	BC CSR Schedule 3.1	-	-	-
Nickel	310	CCME	-	-	-	70 [10]	70 [10]	BC CSR Schedule 3.1	2500	CCME	-
Selenium	125	CCME	-	-	-	1	1	BC CSR Schedule 3.1	1135	CCME	-
Silver	77	MOECC, 2011	-	-	-	-	-	-	-	-	-
Strontium	9400	USEPA, 2019 [5]	-	-	-	-	-	-	-	-	-
Thallium	1	CCME	-	-	-	-	-	-	-	-	-
Tin	9400	USEPA, 2019 [5]	-	-	-	-	-	-	-	-	-
Uranium	33	CCME	-	-	-	30	30	BC CSR Schedule 3.1	-	-	-
Vanadium	39	MOECC, 2011	-	-	-	100	100	BC CSR Schedule 3.1	-	-	-
Zinc	16 000	CCME	-	-	-	200 [10]	200 [10]	BC CSR Schedule 3.1	140 000	CCME	-
<b>General Chemistry Parameters</b>											
Chloride	>1 000 000	BC CSR Schedule 3.1	-	-	-	100	100	BC CSR Schedule 3.1	-	-	-
Sodium	>1 000 000	BC CSR Schedule 3.1	-	-	-	15,000	15,000	BC CSR Schedule 3.1	-	-	-
<b>Petroleum Hydrocarbons (PHC) Parameters</b>											
Benzene	980	ARBCA, 2021	6.9	0.52	ARBCA, 2021	0.094	0.042	ARBCA, 2021	1100	AEP, 2019	-
Toluene	1400	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.74	0.35	ARBCA, 2021	9200	AEP, 2019	-
Ethylbenzene	3100	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.089	0.043	ARBCA, 2021	24 000	AEP, 2019	-
Xylene	1800	ARBCA, 2021	>RES	60	ARBCA, 2021	1.5	0.73	ARBCA, 2021	6900	AEP, 2019	-
Modified TPH (Gas)	22 000	ARBCA, 2021	>RES	2000	ARBCA, 2021	1900	940	ARBCA, 2021	-	-	-
Modified TPH (Fuel)	13 000	ARBCA, 2021	>RES	32000	ARBCA, 2021	4700	1800	ARBCA, 2021	-	-	-
Modified TPH (Lube)	21 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	>RES	15 000	ARBCA, 2021	-	-	-
MTBE	580	AEP, 2019	7.4	0.57	AEP, 2019	0.044	0.062	AEP, 2019	5400	AEP, 2019	-
<b>Polycyclic Aromatic Hydrocarbons (PAH) Parameters</b>											
<b>Non-Carcinogenic PAH Compounds</b>											
Naphthalene	2800	AEP, 2019	370	25	AEP, 2019	28	53	AEP, 2019	26 000	AEP, 2019	-
1 - Methyl-naphthalene	72	MOECC, 2011 [9]	-	-	-	42	30	MOECC, 2011 [9]	-	-	-
2 - Methyl-naphthalene		MOECC, 2011 [9]	-	-	-			MOECC, 2011 [9]	-	-	-
Acenaphthene	8000	AEP, 2019	770 000	43 000	AEP, 2019	NGR	NGR	AEP, 2019	75 000	AEP, 2019	-
Acenaphthylene	78	MOECC, 2011 [4]	390	66	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]	-	-	-
Anthracene	37 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	350 000	AEP, 2019	-

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Fluoranthene		5300	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	50 000	AEP, 2019
Fluorene		4100	AEP, 2019	NGR	91 000	AEP, 2019	NGR	NGR	AEP, 2019	39 000	AEP, 2019
Phenanthrene		-		-	-		24	17	MOECC, 2011	-	
Pyrene		3200	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	30 000	AEP, 2019
<b>Carcinogenic PAH Compounds</b>											
<b>BaP Total Potency Equivalents</b>		5.3	CCME	NGR	NGR	AEP, 2019	IACR<1.0	IACR<1.0	CCME	-	
Benz[a]anthracene		-		-	-		6.4	12	AEP, 2019	-	
Benzo[a]pyrene		-		-	-		7.0	14	AEP, 2019	-	
Benzo[b,j,k]fluoranthene isomers		-		-	-		0.64	1.2	AEP, 2019	-	
Benzo[g,h,i]perylene		-		-	-		130	250	AEP, 2019	-	
Chrysene		-		-	-		40	78	AEP, 2019	-	
Dibenz[a,h]anthracene		-		-	-		4.4	8.8	AEP, 2019	-	
Indeno[1,2,3-c,d]pyrene		-		-	-		51	98	AEP, 2019	-	
<b>Volatile Organic Compound (VOC) Parameters</b>											
Bromodichloromethane		130	MOECC, 2011 [4]	-	-		1.9	1.5	MOECC, 2011	-	
Bromoform		1000	MOECC, 2011 [4]	17	6.1	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011	-	
<b>Bromomethane*</b>		300	BC CSR Schedule 3.1	0.012	0.0016	MOECC, 2011	0.1	0.097	MOECC, 2011	-	
<b>Carbon Tetrachloride (Tetrachloromethane)*</b>		41	AEP, 2019	0.092	0.0069	AEP, 2019	0.037	0.062	AEP, 2019	380	AEP, 2019
Chlorobenzene		25 000	AEP, 2019	2.7	0.22	AEP, 2019	0.61	1.1	AEP, 2019	230 000	AEP, 2019
Chloroethane		-		-	-		-	-		-	
Chloroform		110	AEP, 2019	1.5	0.14	AEP, 2019	0.53	0.88	AEP, 2019	1000	AEP, 2019
Chloromethane		-		-	-		-	-		-	
Dibromochloromethane		1200	AEP, 2019	76	2.5	AEP, 2019	0.91	1.5	AEP, 2019	11 000	AEP, 2019
1,2-Dichlorobenzene		25 000	AEP, 2019	1700	130	AEP, 2019	0.097	0.18	AEP, 2019	230 000	AEP, 2019
1,3-Dichlorobenzene		420	MOECC, 2011	-	-		34	24	MOECC, 2011	-	
1,4-Dichlorobenzene		6200	AEP, 2019	100	8	AEP, 2019	0.051	0.098	AEP, 2019	59 000	AEP, 2019
1,1-Dichloroethane		50 000	BC CSR Schedule 3.1	39	56	MOECC, 2011	0.6	0.47	MOECC, 2011	-	
1,2-Dichloroethane		4200	AEP, 2019	0.37	0.033	AEP, 2019	0.025	0.041	AEP, 2019	40 000	AEP, 2019
1,1-Dichloroethylene		170	ARBCA, 2021	6.6	0.49	ARBCA, 2021	0.38	0.17	ARBCA, 2021	27 000	AEP, 2019
cis-1,2-Dichloroethylene		110	ARBCA, 2021	3.8	0.24	ARBCA, 2021	1.0	0.42	ARBCA, 2021	-	
trans-1,2-Dichloroethylene		1100	ARBCA, 2021	4.1	0.25	ARBCA, 2021	1.4	0.58	ARBCA, 2021	-	
1,2-Dichloropropane		3500	BC CSR Schedule 3.1	0.68	0.16	MOECC, 2011	0.74	0.54	MOECC, 2011	-	
1,3-Dichloropropene		7500	BC CSR Schedule 3.1	2.1	1.8	MOECC, 2011 [4]	0.81	0.59	MOECC, 2011 [4]	-	
<b>Ethylene Dibromide*</b>		2.2	MOECC, 2011 [4]	0.019	0.015	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011	-	
Methylene Chloride (Dichloromethane)		1500	AEP, 2019	110	9.0	AEP, 2019	0.21	0.32	AEP, 2019	14 000	AEP, 2019
Styrene		2500	MOECC, 2011	170	42	MOECC, 2011	66	47	MOECC, 2011	-	
1,1,1,2-Tetrachloroethane		1500	BC CSR Schedule 3.1	1.1	0.87	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011	-	
1,1,2,2-Tetrachloroethane		150	BC CSR Schedule 3.1	0.94	0.19	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011	-	
Tetrachloroethylene		270	ARBCA, 2021	2.9	0.2	ARBCA, 2021	0.57	0.27	ARBCA, 2021	2600	AEP, 2019
1,1,1-Trichloroethane		500 000	BC CSR Schedule 3.1	42	6.1	MOECC, 2011	27	20	MOECC, 2011	-	
1,1,2-Trichloroethane		1000	BC CSR Schedule 3.1	1.1	0.42	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011	-	
<b>Trichloroethylene*</b>		82	ARBCA, 2021	0.14	0.01	ARBCA, 2021	0.13	0.061	ARBCA, 2021	500	AEP, 2019
Vinyl Chloride		170	ARBCA, 2021	0.12	0.0079	ARBCA, 2021	0.060	0.021	ARBCA, 2021	1000	AEP, 2019
<b>Pesticides</b>											
Aldicarb		34	AEP, 2019	-	-		0.041	0.065	AEP, 2019	320	AEP, 2019
Aldrin		5.1	AEP, 2019	-	-		5.9	11	AEP, 2019	49	AEP, 2019
Atrazine		17	AEP, 2019	-	-		0.10	0.19	AEP, 2019	160	AEP, 2019
Azinphos-methyl		84	AEP, 2019	-	-		0.41	0.75	AEP, 2019	790	AEP, 2019

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Bendiocarb		130	AEP, 2019	-	-		0.14	0.21	AEP, 2019	1300	AEP, 2019
Bromoxynil		17	AEP, 2019	-	-		0.18	0.35	AEP, 2019	160	AEP, 2019
Carbaryl		340	AEP, 2019	-	-		1.9	3.6	AEP, 2019	3200	AEP, 2019
Carbofuran		340	AEP, 2019	-	-		0.68	1.2	AEP, 2019	3200	AEP, 2019
Chlorothalonil		500	AEP, 2019	-	-		27	53	AEP, 2019	4800	AEP, 2019
Chlorpyrifos		340	AEP, 2019	-	-		49	95	AEP, 2019	3200	AEP, 2019
Cyanazine		44	AEP, 2019	-	-		0.12	0.21	AEP, 2019	410	AEP, 2019
2,4-D		340	AEP, 2019	-	-		0.43	0.67	AEP, 2019	3200	AEP, 2019
DDT		340	AEP, 2019	-	-		5900	11,000	AEP, 2019	3200	AEP, 2019
Diazinon		67	AEP, 2019	-	-		2.2	4.2	AEP, 2019	630	AEP, 2019
Dicamba		420	AEP, 2019	-	-		0.5	0.79	AEP, 2019	4000	AEP, 2019
Dichlorop-methyl		34	AEP, 2019	-	-		NGR	NGR	AEP, 2019	320	AEP, 2019
Dieldrin		5.1	AEP, 2019	-	-		0.59	1.1	AEP, 2019	49	AEP, 2019
Dimethoate		67	AEP, 2019	-	-		0.077	0.12	AEP, 2019	630	AEP, 2019
Dinoseb		34	AEP, 2019	-	-		2.8	5.5	AEP, 2019	320	AEP, 2019
Diquat		270	AEP, 2019	-	-		11	21	AEP, 2019	2500	AEP, 2019
Diuron		520	AEP, 2019	-	-		1.9	3.5	AEP, 2019	4900	AEP, 2019
Endosulfan		320	AEP, 2019	-	-		99	190	AEP, 2019	3000	AEP, 2019
Endrin		15	AEP, 2019	-	-		2.4	4.7	AEP, 2019	150	AEP, 2019
Glyphosate		1000	AEP, 2019	-	-		0.95	1.4	AEP, 2019	9500	AEP, 2019
Heptachlor		0.69	AEP, 2019	2.4	0.094	AEP, 2019	0.039	0.076	AEP, 2019	6.5	AEP, 2019
Lindane		10	AEP, 2019	-	-		0.31	0.6	AEP, 2019	95	AEP, 2019
Linuron		67	AEP, 2019	-	-		0.56	1.1	AEP, 2019	630	AEP, 2019
Malathion		670	AEP, 2019	-	-		0.82	1.3	AEP, 2019	6300	AEP, 2019
MCPA		690	AEP, 2019	-	-		0.42	0.66	AEP, 2019	160	AEP, 2019
Methoxychlor		5300	AEP, 2019	-	-		NGR	NGR	AEP, 2019	50 000	AEP, 2019
Metolachlor		170	AEP, 2019	-	-		1.3	2.4	AEP, 2019	1600	AEP, 2019
Metribuzin		280	AEP, 2019	-	-		7.8	15	AEP, 2019	2600	AEP, 2019
Paraquat		34	AEP, 2019	-	-		1.1	2.2	AEP, 2019	320	AEP, 2019
Parathion		170	AEP, 2019	-	-		7.2	14	AEP, 2019	1600	AEP, 2019
Phorate		6.7	AEP, 2019	-	-		0.075	0.14	AEP, 2019	63	AEP, 2019
Picloram		670	AEP, 2019	-	-		0.64	0.94	AEP, 2019	6300	AEP, 2019
Simazine		44	AEP, 2019	-	-		0.14	0.25	AEP, 2019	410	AEP, 2019
Tebuthiuron		2400	AEP, 2019	-	-		2.5	3.7	AEP, 2019	22 000	AEP, 2019
Terbufos		1.7	AEP, 2019	-	-		0.08	0.15	AEP, 2019	16	AEP, 2019
Toxaphene		7.3	AEP, 2019	36,000	1400	AEP, 2019	3.3	6.3	AEP, 2019	69	AEP, 2019
Triallate		440	AEP, 2019	-	-		16	31	AEP, 2019	4100	AEP, 2019
Trifluralin		160	AEP, 2019	-	-		NGR	NGR	AEP, 2019	1500	AEP, 2019
<b>PFAS Substances</b>											
Perfluorooctanoic acid (PFOA)		1.05 [8]	HC, 2019	-	-		-	-		-	
Perfluorooctane sulfonate (PFOS)		3.2 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1	-	
Perfluorobutanoate (PFBA)		173	HC, 2019	-	-		-	-		-	
Perfluorobutane sulfonate (PFBS)		92	HC, 2019	-	-		-	-		-	
Perfluorohexanesulfonate (PFHxS)		3.5	HC, 2019	-	-		-	-		-	
Perfluoropentanoate (PFPeA)		1.21	HC, 2019	-	-		-	-		-	
Perfluorohexanoate (PFHxA)		1.21	HC, 2019	-	-		-	-		-	
Perfluoroheptanoate (PFHpA)		1.21	HC, 2019	-	-		-	-		-	
Perfluorononanoate (PFNA)		0.13	HC, 2019	-	-		-	-		-	

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<b>Other Parameters</b>										
Polychlorinated Biphenyl (Total PCB)	33	AEP, 2019	2300	450	MOECC, 2011[4]	1100	770	MOECC, 2011	310	AEP, 2019
Dioxins and Furans (TEQ) (mg TEQ/kg)	0.000004	CCME	0.21	0.043	MOECC, 2011	0.0026	0.0018	MOECC, 2011	0.000004	CCME
Pentachlorophenol (PCP)	340	CCME	240 000	240 000	CCME	7.6	7.6	CCME	3200	AEP, 2019
Organotins - Tributyltin	3.8	USEPA, 2019 [5]	-	-	-	-	-	-	-	-
Ethylene Glycol	110 000	AEP, 2019	NGR	NGR	AEP, 2019	60	68	AEP, 2019	NGR	AEP, 2019
Propylene Glycol	-	-	-	-	-	-	-	-	-	-
Phenol	7000	CCME	1800	1800	CCME	3.8	3.8	CCME	29 000	AEP, 2019

- Notes:
- [1] All values are in units of mg/kg unless otherwise noted.
  - [2] "-" indicates no guideline available; >RES means no soil criteria are shown as residual soil saturation limits may be exceeded; IACR means the CCME Index of Additive Cancer Risk for carcinogenic PAHs.
  - [3] When evaluating human contact with sediments, dry weight chemical concentrations in sediment should be evaluated against the soil quality guidelines for Soil Contact/Ingestion only.
  - [4] Value has been adjusted from its original jurisdictional value, to reflect a  $1 \times 10^{-05}$  Target Cancer Risk Level.
  - [5] Original USEPA value has been divided by 5 to adjust from a target hazard quotient of 1.0 to a target hazard quotient of 0.2.
  - [6] Benzo(a)pyrene (BaP) Total Potency Equivalents (TPE) are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment, 2010 Canadian soil quality guidelines for the protection of environmental and human health: Carcinogenic and Other PAHs."
  - [7] Dioxins and Furans Toxic Equivalents (TEQ), are to be calculated following the methodology shown in "Canadian Council of Ministers of the Environment. 2002. Canadian soil quality guidelines for the protection of environmental and human health: Dioxins and Furans".
  - [8] When PFOS and PFOA co-occur in soil or groundwater, it is recommended that both chemicals be considered together when comparing to screening values. Refer to Health Canada's "Summary Table: Health Canada Draft Guidelines, Screening Values and Toxicological Reference Values (TRVs) for Perfluoroalkyl Substances (PFAS). May, 2019." for specific guidance on calculating PFOS/PFOA ratios and hazard indices.
  - [9] The guideline is applicable to both 1-methylnaphthalene and 2-methylnaphthalene isomers. If both isomers are detected, the sum of the two must not exceed the guideline.
  - [10] The BC CSR Schedule 3.1 value is pH-dependent. The lowest value from Schedule 3.1 is presented.

\* Indicates the derived guideline value is below currently achievable analytical RDLs (the value is not reliably attainable with current analytical methods). For sites where VOCs are identified as a contaminant of potential concern and where the indoor air guidelines are not achievable for the VOC parameters (parent and associated daughter products), soil vapour or subslab vapour testing is required to determine potential exposures. In any such testing program, the site professional must consult with and abide by the guidance provided in ARBCA (2021), with respect to CVOCs, and the Atlantic RBCA Guidance for Vapour Intrusion Assessments posted at: [www.atlanticrbca.com/technical-documents/](http://www.atlanticrbca.com/technical-documents/).