

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

Land Use	Agricultural								
	Pathway	Soil Contact / Ingestion		Inhalation of Indoor Air			Leaching to Potable Groundwater		
		Parameter	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	6800	CCME	-	-		350	350	BC CSR Schedule 3.1	
Beryllium	75	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	
Boron (Total)	4300	MOECC, 2011	-	-		-	-		
Boron (mg/L in saturated paste extract)	7500	AEP, 2019	-	-		65	118	AEP, 2019	
Cadmium	1.4	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	
Chromium (hexavalent)	160	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1	
Chromium (total)	220	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1	
Cobalt	22	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1	
Copper	1100	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1	
Cyanide	29	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1	
Iron	11 000	USEPA, 2019 [5]	-	-		-	-		
Lead	140	CCME	-	-		120	120	BC CSR Schedule 3.1	
Manganese	360	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1	
Mercury (total)	6.6	CCME	-	-		-	-		
Molybdenum	110	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1	
Nickel	200	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1	
Selenium	80	CCME	-	-		1	1	BC CSR Schedule 3.1	
Silver	77	MOECC, 2011	-	-		-	-		
Strontium	9400	USEPA, 2019 [5]	-	-		-	-		
Thallium	1	CCME	-	-		-	-		
Tin	9400	USEPA, 2019 [5]	-	-		-	-		
Uranium	23	CCME	-	-		30	30	BC CSR Schedule 3.1	
Vanadium	39	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1	
Zinc	10 000	CCME	-	-		200 [10]	200 [10]	BC CSR Schedule 3.1	
<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	180	ARBCA, 2021	0.49	0.021	ARBCA, 2021	0.094	0.042	ARBCA, 2021	
Toluene	900	ARBCA, 2021	>RES	47	ARBCA, 2021	0.74	0.35	ARBCA, 2021	
Ethylbenzene	2000	ARBCA, 2021	>RES	60	ARBCA, 2021	0.089	0.043	ARBCA, 2021	
Xylene	1200	ARBCA, 2021	120	4.9	ARBCA, 2021	1.5	0.73	ARBCA, 2021	
Modified TPH (Gas)	15 000	ARBCA, 2021	>RES	75	ARBCA, 2021	1900	940	ARBCA, 2021	
Modified TPH (Fuel)	8600	ARBCA, 2021	>RES	320	ARBCA, 2021	4700	1800	ARBCA, 2021	
Modified TPH (Lube)	14 000	ARBCA, 2021	>RES	1,800	ARBCA, 2021	>RES	15 000	ARBCA, 2021	
MTBE	380	AEP, 2019	1.1	0.046	AEP, 2019	0.044	0.062	AEP, 2019	
<b>Polycyclic Aromatic Hydrocarbons (PAH) Parameters</b>									
<b>Non-Carcinogenic PAH Compounds</b>									
Naphthalene	1800	AEP, 2019	51	2.2	AEP, 2019	28	53	AEP, 2019	



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1 - Methylanthalene		72	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]
2 - Methylanthalene			MOECC, 2011 [9]	-	-	MOECC, 2011 [9]			
Acenaphthene		5300	AEP, 2019	99 000	3900	AEP, 2019	NGR	NGR	AEP, 2019
Acenaphthylene		78	MOECC, 2011 [4]	33	4.5	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]
Anthracene		24 000	AEP, 2019	NGR	670 000	AEP, 2019	NGR	NGR	AEP, 2019
Fluoranthene		3500	AEP, 2019	NGR	480 000	AEP, 2019	NGR	NGR	AEP, 2019
Fluorene		2700	AEP, 2019	220 000	8600	AEP, 2019	NGR	NGR	AEP, 2019
Phenanthrene		-		-	-		24	17	MOECC, 2011
Pyrene		2100	AEP, 2019	NGR	730,000	AEP, 2019	NGR	NGR	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]	2.6	2.7	MOECC, 2011 [4]	2.9	2.3	MOECC, 2011
<b>Bromomethane*</b>		20	BC CSR Schedule 3.1	0.0034	0.00034	MOECC, 2011	0.1	0.097	MOECC, 2011
<b>Carbon Tetrachloride (Tetrachloromethane)*</b>		27	AEP, 2019	0.013	0.00057	AEP, 2019	0.037	0.062	AEP, 2019
Chlorobenzene		16 000	AEP, 2019	0.39	0.018	AEP, 2019	0.61	1.1	AEP, 2019
Chloroethane		-		-	-		-	-	
Chloroform		72	AEP, 2019	0.22	0.011	AEP, 2019	0.53	0.88	AEP, 2019
Chloromethane		-		-	-		-	-	
Dibromochloromethane		760	AEP, 2019	7.8	0.27	AEP, 2019	0.91	1.5	AEP, 2019
1,2-Dichlorobenzene		16 000	AEP, 2019	230	10	AEP, 2019	0.097	0.18	AEP, 2019
1,3-Dichlorobenzene		420	MOECC, 2011	-	-		34	24	MOECC, 2011
1,4-Dichlorobenzene		4200	AEP, 2019	14	0.67	AEP, 2019	0.051	0.098	AEP, 2019
1,1-Dichloroethane		8500	BC CSR Schedule 3.1	31	3.5	MOECC, 2011	0.6	0.47	MOECC, 2011
<b>1,2-Dichloroethane*</b>		2800	AEP, 2019	0.055	0.0027	AEP, 2019	0.025	0.041	AEP, 2019
<b>1,1-Dichloroethylene*</b>		110	ARBCA, 2021	0.93	0.039	ARBCA, 2021	0.38	0.17	ARBCA, 2021
<b>cis-1,2-Dichloroethylene*</b>		74	ARBCA, 2021	0.52	0.019	ARBCA, 2021	1.0	0.42	ARBCA, 2021
<b>trans-1,2-Dichloroethylene*</b>		740	ARBCA, 2021	0.56	0.02	ARBCA, 2021	1.4	0.58	ARBCA, 2021
1,2-Dichloropropane		600	BC CSR Schedule 3.1	0.085	0.01	MOECC, 2011	0.74	0.54	MOECC, 2011
1,3-Dichloropropene		1000	BC CSR Schedule 3.1	0.83	0.27	MOECC, 2011 [4]	0.81	0.27	MOECC, 2011 [4]
<b>Ethylene Dibromide*</b>		2.2	MOECC, 2011 [4]	0.0054	0.014	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011
Methylene Chloride (Dichloromethane)		990	AEP, 2019	16	0.71	AEP, 2019	0.21	0.32	AEP, 2019
Styrene		2500	MOECC, 2011	19	16	MOECC, 2011	66	47	MOECC, 2011
1,1,1,2-Tetrachloroethane		250	BC CSR Schedule 3.1	0.46	0.58	MOECC, 2011 [4]	0.2	0.15	MOECC, 2011

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1,1,2,2-Tetrachloroethane		35	BC CSR Schedule 3.1	0.096	0.045	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011
<b>Tetrachloroethylene*</b>		170	ARBCA, 2021	0.39	0.016	ARBCA, 2021	0.57	0.27	ARBCA, 2021
1,1,1-Trichloroethane		85 000	BC CSR Schedule 3.1	3.4	0.38	MOECC, 2011	27	20	MOECC, 2011
1,1,2-Trichloroethane		150	BC CSR Schedule 3.1	0.18	0.3	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011
<b>Trichloroethylene*</b>		54	ARBCA, 2021	0.02	0.00081	ARBCA, 2021	0.13	0.061	ARBCA, 2021
<b>Vinyl Chloride*</b>		31	ARBCA, 2021	0.0087	0.00031	ARBCA, 2021	0.060	0.021	ARBCA, 2021
<b>Pesticides</b>									
Aldicarb		22	AEP, 2019	-	-		0.041	0.065	AEP, 2019
Aldrin		3.4	AEP, 2019	-	-		5.9	11	AEP, 2019
Atrazine		11	AEP, 2019	-	-		0.10	0.17	AEP, 2019
Azinphos-methyl		55	AEP, 2019	-	-		0.41	0.75	AEP, 2019
Bendiocarb		89	AEP, 2019	-	-		0.14	0.21	AEP, 2019
Bromoxynil		11	AEP, 2019	-	-		0.18	0.35	AEP, 2019
Carbaryl		220	AEP, 2019	-	-		1.9	3.6	AEP, 2019
Carbofuran		220	AEP, 2019	-	-		0.68	1.2	AEP, 2019
Chlorothalonil		330	AEP, 2019	-	-		27	53	AEP, 2019
Chlorpyrifos		220	AEP, 2019	-	-		49	95	AEP, 2019
Cyanazine		29	AEP, 2019	-	-		0.12	0.21	AEP, 2019
2,4-D		220	AEP, 2019	-	-		0.43	0.69	AEP, 2019
DDT		220	AEP, 2019	-	-		5,900	11,000	AEP, 2019
Diazinon		44	AEP, 2019	-	-		2.2	4.2	AEP, 2019
Dicamba		280	AEP, 2019	-	-		0.5	0.79	AEP, 2019
Dichlorop-methyl		22	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Dieldrin		3.4	AEP, 2019	-	-		0.59	11	AEP, 2019
Dimethoate		44	AEP, 2019	-	-		0.077	0.12	AEP, 2019
Dinoseb		22	AEP, 2019	-	-		2.8	5.5	AEP, 2019
Diquat		180	AEP, 2019	-	-		11	21	AEP, 2019
Diuron		350	AEP, 2019	-	-		1.9	3.5	AEP, 2019
Endosulfan		210	AEP, 2019	-	-		99	190	AEP, 2019
Endrin		10	AEP, 2019	-	-		2.4	4.7	AEP, 2019
Glyphosate		670	AEP, 2019	-	-		0.95	1.4	AEP, 2019
Heptachlor		0.46	AEP, 2019	0.21	0.012	AEP, 2019	0.039	0.076	AEP, 2019
Lindane		6.7	AEP, 2019	-	-		0.31	0.6	AEP, 2019
Linuron		44	AEP, 2019	-	-		0.56	1.1	AEP, 2019
Malathion		440	AEP, 2019	-	-		0.82	1.3	AEP, 2019
MCPA		460	AEP, 2019	-	-		0.42	0.66	AEP, 2019
Methoxychlor		3500	AEP, 2019	-	-		NGR	NGR	AEP, 2019
Metolachlor		110	AEP, 2019	-	-		1.3	2.4	AEP, 2019
Metribuzin		180	AEP, 2019	-	-		7.8	15	AEP, 2019
Paraquat		22	AEP, 2019	-	-		1.1	2.2	AEP, 2019
Parathion		110	AEP, 2019	-	-		7.2	14	AEP, 2019
Phorate		4.4	AEP, 2019	-	-		0.075	0.14	AEP, 2019

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		Parameter	Fine / Coarse	Reference	Fine	Coarse	Reference	Fine	Coarse
Picloram		440	AEP, 2019	-	-		0.64	0.94	AEP, 2019
Simazine		29	AEP, 2019	-	-		0.14	0.25	AEP, 2019
Tebuthiuron		1600	AEP, 2019	-	-		2.5	3.7	AEP, 2019
Terbufos		1.1	AEP, 2019	-	-		0.08	0.015	AEP, 2019
Toxaphene		4.8	AEP, 2019	3100	170	AEP, 2019	3.3	6.3	AEP, 2019
Triallate		290	AEP, 2019	-	-		16	31	AEP, 2019
Trifluralin		110	AEP, 2019	-	-		NGR	NGR	AEP, 2019
<b>PFAS Substances</b>									
Perfluorooctanoic acid (PFOA)		0.70 [8]	HC, 2019	-	-		-	-	
Perfluorooctane sulfonate (PFOS)		2.1 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1
Perfluorobutanoate (PFBA)		114	HC, 2019	-	-		-	-	
Perfluorobutane sulfonate (PFBS)		61	HC, 2019	-	-		-	-	
Perfluorohexanesulfonate (PFHxS)		2.3	HC, 2019	-	-		-	-	
Perfluoropentanoate (PFPeA)		0.8	HC, 2019	-	-		-	-	
Perfluorohexanoate (PFHxA)		0.8	HC, 2019	-	-		-	-	
Perfluoroheptanoate (PFHpA)		0.8	HC, 2019	-	-		-	-	
Perfluorononanoate (PFNA)		0.08	HC, 2019	-	-		-	-	
<b>Other Parameters</b>									
Polychlorinated Biphenyl (Total PCB)		22	AEP, 2019	190	31	MOECC, 2011 [4]	1100	770	MOECC, 2011
Dioxins and Furans (TEQ) (mg TEQ/kg)		0.000004	CCME	0.017	0.0028	MOECC, 2011	0.0026	0.0018	MOECC, 2011
Pentachlorophenol (PCP)		93	CCME	66 000	66 000	CCME	7.6	7.6	CCME
Organotins - Tributyltin		3.8	USEPA, 2019 [5]	-	-		-	-	
Ethylene Glycol		73 000	AEP, 2019	NGR	86 000	AEP, 2019	60	68	AEP, 2019
Propylene Glycol		-		-	-		-	-	
Phenol		1900	CCME	500	500	CCME	3.8	3.8	CCME

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.atlanticrbc.ca.com/technical-documents/](http://www.atlanticrbc.ca.com/technical-documents/).

