

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

Land Use	Industrial										
	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		220 000	USEPA, 2019 [5]	-	-		-	-		-	
Antimony		63	MOECC, 2011	-	-		-	-		-	
Arsenic		31	CCME [4]	-	-		10	10	BC CSR Schedule 3.1	39	CCME [4]
Barium		130 000	CCME	-	-		350	350	BC CSR Schedule 3.1	96 000	CCME
Beryllium		1400	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	1100	CCME
Boron (Total)		24 000	MOECC, 2011	-	-		-	-		-	
Boron (mg/L in saturated paste extract)		230 000	AEP, 2019	-	-		65	118	AEP, 2019	110 000	AEP, 2019
Cadmium		2090	CCME	-	-		1 [10]	1 [10]	BC CSR Schedule 3.1	192	CCME
Chromium (hexavalent)		1300	MOECC, 2011	-	-		60	60	BC CSR Schedule 3.1	-	
Chromium (total)		6700	CCME	-	-		>1 000 000	>1 000 000	BC CSR Schedule 3.1	2300	CCME
Cobalt		250	MOECC, 2011	-	-		25	25	BC CSR Schedule 3.1	-	
Copper		20 000	CCME	-	-		250 [10]	250 [10]	BC CSR Schedule 3.1	16 000	CCME
Cyanide		2300	CCME	-	-		6.5	6.5	BC CSR Schedule 3.1	420	CCME
Iron		164 000	USEPA, 2019 [5]	-	-		-	-		-	
Lead		8200	CCME	-	-		120	120	BC CSR Schedule 3.1	740	CCME
Manganese		5200	USEPA, 2019 [5]	-	-		2000	2000	BC CSR Schedule 3.1	-	
Mercury (total)		690	CCME	-	-		-	-		99	CCME
Molybdenum		1200	MOECC, 2011	-	-		15	15	BC CSR Schedule 3.1	-	
Nickel		5100	CCME	-	-		70 [10]	70 [10]	BC CSR Schedule 3.1	2500	CCME
Selenium		4050	CCME	-	-		1	1	BC CSR Schedule 3.1	1135	CCME
Silver		490	MOECC, 2011	-	-		-	-		-	
Strontium		140 000	USEPA, 2019 [5]	-	-		-	-		-	
Thallium		1	CCME	-	-		-	-		-	
Tin		140 000	USEPA, 2019 [5]	-	-		-	-		-	
Uranium		510	CCME	-	-		30	30	BC CSR Schedule 3.1	300	CCME
Vanadium		160	MOECC, 2011	-	-		100	100	BC CSR Schedule 3.1	-	
Zinc		270 000	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		4700	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.74	0.35	ARBCA, 2021	9200	AEP, 2019
Ethylbenzene		11 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	0.089	0.043	ARBCA, 2021	24 000	AEP, 2019
Xylene		6300	ARBCA, 2021	>RES	60	ARBCA, 2021	1.5	0.73	ARBCA, 2021	6900	AEP, 2019
Modified TPH (Gas)		77 000	ARBCA, 2021	>RES	2000	ARBCA, 2021	1900	940	ARBCA, 2021	-	
Modified TPH (Fuel)		47 000	ARBCA, 2021	>RES	32000	ARBCA, 2021	4700	1800	ARBCA, 2021	-	
Modified TPH (Lube)		74 000	ARBCA, 2021	>RES	>RES	ARBCA, 2021	>RES	15 000	ARBCA, 2021	-	
MTBE		6800	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		34 000	AEP, 2019	370	25	AEP, 2019	28	53	AEP, 2019	26 000	AEP, 2019
1 - Methylnaphthalene		560	MOECC, 2011 [9]	-	-		42	30	MOECC, 2011 [9]	-	
2 - Methylnaphthalene			MOECC, 2011 [9]	-	-				MOECC, 2011 [9]	-	
Acenaphthene		75 000	AEP, 2019	770 000	43 000	AEP, 2019	NGR	NGR	AEP, 2019	75 000	AEP, 2019
Acenaphthylene		96	MOECC, 2011 [4]	390	66	MOECC, 2011 [4]	32	23	MOECC, 2011 [4]	-	
Anthracene		300 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	350 000	AEP, 2019
Fluoranthene		50 000	AEP, 2019	NGR	NGR	AEP, 2019	NGR	NGR	AEP, 2019	50 000	AEP, 2019

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Fluorene		46 000	AEP, 2019	NGR	91,000	AEP, 2019	NGR	NGR	AEP, 2019	39 000	AEP, 2019
Phenanthrene		-	-	-	-	-	24	17	MOECC, 2011	-	-
Pyrene		34 000	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	75	AEP, 2019
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		180	MOECC, 2011 [4]	-	-	-	1.9	1.5	MOECC, 2011	-	-
Bromoform		1400	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>		480	AEP, 2019	0.092	0.0069	AEP, 2019	0.037	0.062	AEP, 2019	380	AEP, 2019
Chlorobenzene		300 000	AEP, 2019	2.7	0.22	AEP, 2019	0.61	1.1	AEP, 2019	230 000	AEP, 2019
Chloroethane		-	-	-	-	-	-	-	-	-	-
Chloroform		1800	AEP, 2019	1.5	0.14	AEP, 2019	0.53	0.88	AEP, 2019	1000	AEP, 2019
Chloromethane		-	-	-	-	-	-	-	-	-	-
Dibromochloromethane		14 000	AEP, 2019	76	2.5	AEP, 2019	0.91	1.5	AEP, 2019	11 000	AEP, 2019
1,2-Dichlorobenzene		300 000	AEP, 2019	1700	130	AEP, 2019	0.097	0.18	AEP, 2019	230 000	AEP, 2019
1,3-Dichlorobenzene		4400	MOECC, 2011	-	-	-	34	24	MOECC, 2011	-	-
1,4-Dichlorobenzene		74 000	AEP, 2019	100	8	AEP, 2019	0.051	0.098	AEP, 2019	59 000	AEP, 2019
1,1-Dichloroethane		>1 000 000	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		590	ARBCA, 2021	6.6	0.49	ARBCA, 2021	0.38	0.17	ARBCA, 2021	27 000	AEP, 2019
cis-1,2-Dichloroethylene		390	ARBCA, 2021	3.8	0.24	ARBCA, 2021	1.0	0.42	ARBCA, 2021	-	-
trans-1,2-Dichloroethylene		3900	ARBCA, 2021	4.1	0.25	ARBCA, 2021	1.4	0.58	ARBCA, 2021	-	-
1,2-Dichloropropane		10 000	BC CSR Schedule 3.1	0.68	0.16	MOECC, 2011	0.74	0.54	MOECC, 2011	-	-
1,3-Dichloropropane		200 000	BC CSR Schedule 3.1	2.1	1.8	MOECC, 2011 [4]	0.81	0.59	MOECC, 2011 [4]	-	-
<b>Ethylene Dibromide*</b>		3.1	MOECC, 2011 [4]	0.019	0.015	MOECC, 2011 [4]	0.0062	0.0048	MOECC, 2011	-	-
Methylene Chloride (Dichloromethane)		7300	AEP, 2019	110	9	AEP, 2019	0.21	0.32	AEP, 2019	14 000	AEP, 2019
Styrene		26 000	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	-	-
1,1,1,2,2-Tetrachloroethane		150	BC CSR Schedule 3.1	0.94	0.19	MOECC, 2011 [4]	0.19	0.14	MOECC, 2011	-	-
Tetrachloroethylene		920	ARBCA, 2021	2.9	0.2	ARBCA, 2021	0.57	0.27	ARBCA, 2021	2.1	CCME
1,1,1-Trichloroethane		>1 000 000	BC CSR Schedule 3.1	42	6.1	MOECC, 2011	27	20	MOECC, 2011	-	-
1,1,2-Trichloroethane		30 000	BC CSR Schedule 3.1	1.1	0.42	MOECC, 2011 [4]	0.73	0.54	MOECC, 2011	-	-
<b>Trichloroethylene*</b>		280	ARBCA, 2021	0.14	0.01	ARBCA, 2021	0.13	0.061	ARBCA, 2021	500	AEP, 2019
Vinyl Chloride		340	ARBCA, 2021	0.24	0.016	ARBCA, 2021	0.060	0.021	ARBCA, 2021	1000	AEP, 2019
<b>Pesticides</b>											
Aldicarb		160	AEP, 2019	-	-	-	0.041	0.065	AEP, 2019	320	AEP, 2019
Aldrin		44	AEP, 2019	-	-	-	5.9	11	AEP, 2019	49	AEP, 2019
Atrazine		80	AEP, 2019	-	-	-	0.10	0.19	AEP, 2019	160	AEP, 2019
Azinphos-methyl		400	AEP, 2019	-	-	-	0.41	0.75	AEP, 2019	790	AEP, 2019
Bendiocarb		640	AEP, 2019	-	-	-	0.14	0.21	AEP, 2019	1300	AEP, 2019
Bromoxynil		80	AEP, 2019	-	-	-	0.18	0.35	AEP, 2019	160	AEP, 2019

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Carbaryl		1600	AEP, 2019	-	-		1.9	3.6	AEP, 2019	3200	AEP, 2019
Carbofuran		1600	AEP, 2019	-	-		0.68	1.2	AEP, 2019	3200	AEP, 2019
Chlorothalonil		2400	AEP, 2019	-	-		27	53	AEP, 2019	4800	AEP, 2019
Chlorpyrifos		1600	AEP, 2019	-	-		49	95	AEP, 2019	3200	AEP, 2019
Cyanazine		210	AEP, 2019	-	-		0.12	0.21	AEP, 2019	410	AEP, 2019
2,4-D		1600	AEP, 2019	-	-		0.43	0.67	AEP, 2019	3200	AEP, 2019
DDT		1600	AEP, 2019	-	-		5900	11,000	AEP, 2019	3200	AEP, 2019
Diazinon		320	AEP, 2019	-	-		2.2	4.2	AEP, 2019	630	AEP, 2019
Dicamba		2000	AEP, 2019	-	-		0.5	0.79	AEP, 2019	4000	AEP, 2019
Dichlorop-methyl		160	AEP, 2019	-	-		NGR	NGR	AEP, 2019	320	AEP, 2019
Dieldrin		44	AEP, 2019	-	-		0.59	1.1	AEP, 2019	49	AEP, 2019
Dimethoate		320	AEP, 2019	-	-		0.077	0.12	AEP, 2019	630	AEP, 2019
Dinoseb		160	AEP, 2019	-	-		2.8	5.5	AEP, 2019	320	AEP, 2019
Diquat		1300	AEP, 2019	-	-		11	21	AEP, 2019	2500	AEP, 2019
Diuron		2500	AEP, 2019	-	-		1.9	3.5	AEP, 2019	4900	AEP, 2019
Endosulfan		3000	AEP, 2019	-	-		99	190	AEP, 2019	3000	AEP, 2019
Endrin		130	AEP, 2019	-	-		2.4	4.7	AEP, 2019	150	AEP, 2019
Glyphosate		4800	AEP, 2019	-	-		0.95	1.4	AEP, 2019	9500	AEP, 2019
Heptachlor		2.8	AEP, 2019	2.4	0.094	AEP, 2019	0.039	0.076	AEP, 2019	6.5	AEP, 2019
Lindane		48	AEP, 2019	-	-		0.31	0.6	AEP, 2019	95	AEP, 2019
Linuron		320	AEP, 2019	-	-		0.56	1.1	AEP, 2019	630	AEP, 2019
Malathion		3200	AEP, 2019	-	-		0.82	1.3	AEP, 2019	6300	AEP, 2019
MCPA		8200	AEP, 2019	-	-		0.42	0.66	AEP, 2019	160	AEP, 2019
Methoxychlor		50 000	AEP, 2019	-	-		NGR	NGR	AEP, 2019	50 000	AEP, 2019
Metolachlor		800	AEP, 2019	-	-		1.3	2.4	AEP, 2019	1600	AEP, 2019
Metribuzin		1300	AEP, 2019	-	-		7.8	15	AEP, 2019	2600	AEP, 2019
Paraquat		160	AEP, 2019	-	-		1.1	2.2	AEP, 2019	320	AEP, 2019
Parathion		800	AEP, 2019	-	-		7.2	14	AEP, 2019	1600	AEP, 2019
Phorate		32	AEP, 2019	-	-		0.075	0.14	AEP, 2019	63	AEP, 2019
Picloram		3200	AEP, 2019	-	-		0.64	0.94	AEP, 2019	6300	AEP, 2019
Simazine		210	AEP, 2019	-	-		0.14	0.25	AEP, 2019	410	AEP, 2019
Tebuthiuron		11 000	AEP, 2019	-	-		2.5	3.7	AEP, 2019	22 000	AEP, 2019
Terbufos		8	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		2100	AEP, 2019	-	-		16	31	AEP, 2019	4100	AEP, 2019
Trifluralin		770	AEP, 2019	-	-		NGR	NGR	AEP, 2019	1500	AEP, 2019
<b>PFAS Substances</b>											
Perfluorooctanoic acid (PFOA)		9.94 [8]	HC, 2019	-	-		-	-		-	
Perfluorooctane sulfonate (PFOS)		30.5 [8]	HC, 2019	-	-		0.35	0.35	BC CSR Schedule 3.1	-	
Perfluorobutanoate (PFBA)		1630	HC, 2019	-	-		-	-		-	
Perfluorobutane sulfonate (PFBS)		872	HC, 2019	-	-		-	-		-	
Perfluorohexanesulfonate (PFHxS)		33	HC, 2019	-	-		-	-		-	
Perfluoropentanoate (PFPeA)		11.41	HC, 2019	-	-		-	-		-	
Perfluorohexanoate (PFHxA)		11.41	HC, 2019	-	-		-	-		-	
Perfluoroheptanoate (PFHpA)		11.41	HC, 2019	-	-		-	-		-	
Perfluorononanoate (PFNA)		1.2	HC, 2019	-	-		-	-		-	
<b>Other Parameters</b>											
Polychlorinated Biphenyl (Total PCB)		160	AEP, 2019	2300	450	MOECC, 2011 [4]	1100	770	MOECC, 2011	310	AEP, 2019
Dioxins and Furans (TEQ) (mg TEQ/kg)		0.000175	CCME	0.21	0.043	MOECC, 2011	0.0026	0.0018	MOECC, 2011	0.000004	CCME
Pentachlorophenol (PCP)		7500	CCME	280 000	280 000	CCME	7.6	7.6	CCME	1300	CCME

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Organotins - Tributyltin	50	USEPA, 2019 [5]	-	-	-	-	-	-	-	-	-
Ethylene Glycol	530 000	AEP, 2019	NGR	NGR	AEP, 2019	60	68	AEP, 2019	NGR	AEP, 2019	
Propylene Glycol	-		-	-	-	-	-	-	-	-	
Phenol	150 000	CCME	2100	2100	CCME	3.8	3.8	CCME	28 000	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.atlanticrbca.com/technical-documents/](http://www.atlanticrbca.com/technical-documents/).