

Appendix A An Interjurisdictional Comparison of Water Quality Standards

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Water Quality Standards: Contaminant Standards Required in the Ontario Drinking Water Regulation Compared to Canadian Guidelines and the United States, Australia and the World Health Organization

Table A.1.1. Chemical/Physical Standards and Objectives (mg/L)

Parameter	Ontario	Canada	US	Australia	WHO ¹
Acephate				0.01a	
Acrylamide			0b ²	0.0002a	0.0005a
Alachlor	0.005b		0.002a ³		0.020a
Aldicarb	0.009a	0.009a ³	0.007ab ⁴	0.001ab	0.010a
Aldrin + Dieldrin	0.0007a	0.0007a		0.00001b ⁵	0.00003a
Ametyrn				0.005b ⁶	
Amitrole				0.001b ⁷	
Antimony		0.006b	0.006ab	0.003a	0.005b
Arsenic	0.025b	0.025b	0.05a ⁸	0.007a	0.01b
Asbestos			7ab ⁹	Insufficient data	Unnecessary ⁹
Asulam				0.05b	
Atrazine + N-dealkylated metabolites	0.005b	0.005b	0.003ab ¹⁰	0.0005b ¹¹	0.002a ¹²
Azinphos-methyl	0.02a	0.02a		0.002b ¹³	

¹ Some values have been converted from mg/L for consistency

² TT – the combination (or product) of dose and monomer level shall not exceed that equivalent to a polyacrylamide polymer containing 0.05 % monomer dosed at 1 mg/L

³ Aldicarb + metabolites

⁴ The lifetime Health Advisory value or the MCL/MCLG value for any combination of two or more of the chemicals aldicarb, aldicarb sulfone and aldicarb sulfoxide should remain at 0.007 mg/L because of a similar mode of action

⁵ Health value is 0.0003

⁶ Health value is 0.05

⁷ Health value is 0.01

⁸ Units are MFL – million fibers per liter

⁹ The WHO finds that it is unnecessary to recommend a health-based guideline for this compound because it is not hazardous to human health at concentrations normally found in drinking water.

¹⁰ Atrazine only and under review

¹¹ Atrazine only and the health value is 0.2

¹² Atrazine only

¹³ Health value is 0.003

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Barium	1.0a	1.0a	2ab	0.7a	0.7a
Bendiocarb	0.04a	0.04a			
Benomyl				0.1a	
Bentazone				0.03a	0.300a
Benzene	0.005a	0.005a	0.005a ^a	0.001a	0.010a
Benzo(a)pyrene	0.00001a	0.00001a	0.0002a ^a	0.00001a	0.0007a
Beryllium			0.004ab	Inadequate data	Inadequate data
Bioresmethrin				0.1a	
Boron	5.0b	5.0b		0.3a	0.5b
Bromacil				0.1b ¹⁴	
Bromate		0.01b	0.010a ^a	0.02a	0.025b
Bromodichloromethane (THM)			0.080a ^{ab}		0.060a
Bromoform (THM)			0.080a ^{ab}		0.100a
Bromophos-ethyl				0.01a	
Bromoxynil	0.005b	0.005b		0.03 ^a	
Cadmium	0.005a	0.005a	0.005ab	0.002a	0.003a
Carbaryl	0.09a	0.09a		0.005b ¹⁵	
Carbendazim				0.1a	
Carbofuran	0.09a	0.09a	0.04ab ¹⁶	0.005b ¹⁷	0.007a
Carbon Tetrachloride	0.005a	0.005a	0.005a ^a	0.003a	0.002a
Carbophenothion				0.0005a	

¹⁴ Health value is 0.3¹⁵ Health value is 0.03¹⁶ Under review¹⁷ Health value is 0.01

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Carboxin				0.002b ¹⁸	
Chloral hydrate					0.010b
Chloramines	3.0a	3.0a	4ab		
Chlordane (total)	0.007a		0.002a ⁸	0.00001b ¹⁹	0.0002a
Chlorfenvinphos				0.005a	
Chlorine			4ab	5.0a ²⁰	5a
Chlorine Dioxide			0.8ab	1.0a ²¹	²²
Chlorite			1.0a ²³	0.3a	0.200b
Chloroacetic acids				0.15a	
Chlorobenzene			0.1ab	0.3a ²⁴	
Chloroform (THM)			0.080a ^{8b}		0.200a
2-Chlorophenol				0.3a ²⁵	Inadequate data
Chlorothalonil				0.0001b ²⁶	
Chlorotoluron					0.050a
Chloroxuron				0.01a	
Chlorpyrifos	0.09a	0.09a		0.01a	
Chlorsulfuron				0.1a	
Chlpyralid				1ab	

¹⁸ Health value is 0.3

¹⁹ Aesthetic value is 0.0001

²⁰ Aesthetic value is 0.6

²¹ Aesthetic value is 0.4

²² The WHO states: "A guideline value has not been established because of the rapid breakdown of chlorine dioxide and because the chlorite guideline is adequately protective for potential toxicity from chlorine dioxide."

²³ MCLG is 0.8

²⁴ Aesthetic value is 0.01

²⁵ Aesthetic value is 0.0001

²⁶ Health value 0.03

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Chromium	0.05a	0.05a	0.1ab	0.05a	0.05b
Copper			1.3bc	2a ²⁷	2b
Cyanazine	0.01b	0.01b			0.0006a
Cyanide	0.2a	0.2a	0.2ab	0.08a ²⁸	0.070a ²⁹
Dalapon (sodium salt)			0.2ab		
2,4-DB					0.090a
Di(2-ethylhexyl)adipate			0.4ab	Insufficient data	0.080a
Di(2-ethylhexyl)phthalate (PAE)			0.006a ³⁰	0.01a	0.008a
Diazinon	0.02a	0.02a		0.001b ³⁰	
1,2-dibromo-3-chloropropane					0.001a
1,2-dibromoethane					0.0004-0.015b
Dibromoacetonitrile				Insufficient data	0.100b
Dibromochloromethane			0.080a ³¹		0.100a
Dibromochloropropane (DBCP)			0.0002a		
Dicamba	0.12a	0.12a		0.1a	
Dichlobenil				0.01a	
Dichloroacetic acid			0.060a ^{ac}	0.1a	0.050b
Dichloroacetonitrile				Insufficient data	0.090b
Dichlorobenzene o-			0.6ab		
Dichlorobenzene p-			0.075ab		

²⁷ Health value is 0.3²⁸ Cyanogen chloride (as cyanide)²⁹ Cyanogen chloride (as cyanide)³⁰ Health value is 0.0003³¹ MCLG is 0.06

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
1,2-Dichlorobenzene	0.2a ³²	0.20a ³⁵		1.5a ³⁴	1.000a
1,4-Dichlorobenzene	0.005a ³⁵	0.005a ³⁶		0.04b ³⁷	0.500a
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03a			0.00006b ³⁸	0.002a
1,2-Dichloroethane	0.005b	0.005b	0.005a ^a	0.003a	0.030a
1,1-Dichloroethene				0.03a	0.030a
1,2-Dichloroethene				0.06a	0.050a
1,1-Dichloroethylene (vinylidene chloride)	0.014a	0.014a	0.007ab		
Dichloroethylene (cis-1,2-)			0.07ab		
Dichloroethylene (trans-1,2-)			0.1ab		
Dichloromethane	0.05a	0.05a	0.005a ^a	0.004a	0.020a
2,4-Dichlorophenol	0.9a ³⁹	0.9a ⁴⁰		0.2a ⁴¹	Inadequate data
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1b	0.1b	0.07ab	0.0001b ²	0.030a
Dichloropropane (1,2-)			0.005a ^a		0.040a
1,3-dichloropropene					0.020a
Dichloroprop					0.100a
Dichlorvos				0.001ab	
Dicofop-methyl	0.009a	0.009a		0.005a	

³² Aesthetic objective is 0.003.³³ Aesthetic objective is ≤ 0.003 .³⁴ Aesthetic value is 0.001.³⁵ Aesthetic objective is 0.001.³⁶ Aesthetic objective is ≤ 0.001 .³⁷ Aesthetic value is 0.0003.³⁸ DDT only and health value is 0.02.³⁹ Aesthetic objective is 0.0003.⁴⁰ Aesthetic objective is ≤ 0.003 .⁴¹ Aesthetic objective is aesthetic value.⁴² Health value is 0.03.

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Dicofol				0.003a	
Difenzoquat				0.1a	
Dimethoate	0.02b	0.02b		0.05a	
Dinoseb	0.01a	0.01a	0.007ab		
Dioxin and Furan	0.000000015b ⁴⁵		0.00000003a ⁴⁴		
Diphenamid				0.002b ⁴⁵	
Diquat	0.07a	0.07a	0.02ab	0.0005b ⁴⁶	0.010b
Disulfoton				0.001b ⁴⁷	
Diuron	0.15a	0.15a		0.03a	
DPA (2,2-DPA)				0.5a	0.020a
EDB				0.001ab	
Endosulfan				0.00005b ⁴⁸	
Endothal			0.1ab	0.01b ⁴⁹	
Endrin			0.002ab		0.020a
Epichlorohydrin			0.0b ⁵⁰	0.0005a	0.0004b
EPTC				0.001b ⁵¹	
Ethion				0.003a	
Ethoprophos				0.001ab	

⁴³ Total toxic equivalents when compared with 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin)

⁴⁴ Dioxin (2,3,7,8-TCDD) only

⁴⁵ Health value 0.3

⁴⁶ Health value 0.005

⁴⁷ Health value is 0.003

⁴⁸ Health value is 0.03

⁴⁹ Health value 0.1

⁵⁰ TI – the combination (or product) of dose and monomer level shall not exceed that equivalent to a polymer containing 0.01 % monomer dosed at 20 mg/L

⁵¹ Health value is 0.03

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Ethylbenzene			0.7ab	0.3a ⁵²	0.300a
Ethylenediamine tetraacetic acid (EDTA)				0.25a	0.600a
Ethylene dibromide			0.00005a ³		
Etridiazole				0.0001b ⁵³	
Fenamiphos				0.0003a	
Fenarimol				0.001b ⁵⁴	
Fenchlorphos				0.03a	
Fenitrothion				0.01a	
Fenoprop				0.01a	0.009a
Fensulfothion				0.01ab	
Fenvalerate				0.05a	
Flamprop-methyl				0.003a	
Fluometuron				0.05a	
Fluoride	1.5a ⁵⁵	1.5a	4ab	1.5a	1.5a
Formaldehyde				0.5a	0.900a
Formothion				0.05a	
Fosamine				0.03a	
Glyphosphate	0.28b	0.28b	0.7ab	0.01b ⁵⁶	Unnecessary ⁵⁷

⁵² Aesthetic value is 0.003

⁵³ Health value is 0.1

⁵⁴ Health value is 0.03

⁵⁵ Where fluoride is added to drinking water, it is recommended that the concentration be adjusted to 1.0 +/- 0.2 mg/L the optimum level for control of tooth decay. Where supplies contain naturally occurring fluoride at levels higher than 1.5 mg/L but less than 2.4 mg/L the Ministry of Health and Long Term Care recommends an approach through local boards of health to raise public awareness to control excessive exposure to fluoride from other sources. Levels above the MAC must be reported to the local Medical Officer of Health.

⁵⁶ Health value is 1

⁵⁷ The WHO finds that it is unnecessary to recommend a health-based guideline for this compound because it is not hazardous to human health at concentrations normally found in drinking water.

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Haloacetic Acids			0.060a ^c		
Heptachlor + Heptachlor Epoxide	0.003a		0.0004a ⁵⁸	0.00005b ⁵⁹	0.00003a
Hexachlorobenzene			0.001 ^a		0.001a
Hexachlorobutadiene				0.0007a	0.0006a
Hexachlorocyclopentadiene			0.05ab		
Hexaflurate				0.03a	
Hexazihone				0.002b ⁶⁰	
Iodide				0.1a	
Iodine				Insufficient Data	Inadequate Data
Isoproturon					0.009a
Lead	0.01a ⁶¹	0.01a	0.015c ^c	0.01a	0.01a
Lindane (total)	0.004a		0.0002ab	0.00005b ⁶²	0.002a
Malathion	0.19a	0.19a			
Maldison				0.05a	
Manganese				0.5a ⁶³	0.5b
MCPA					0.002a
Mecoprop					0.010a
Mercury	0.001a	0.001a	0.002ab ⁶⁴	0.001a	0.001a ⁶⁵
Methidathion				0.03a	

⁵⁸ This applies to Heptachlor only. Heptachlor epoxide has an MCL of 0.0002 and an MCLG of zero.

⁵⁹ Aesthetic value is 0.0003

⁶⁰ Health value is 0.3

⁶¹ This standard applies to water at the point of consumption.

⁶² Health value is 0.02

⁶³ Aesthetic value is 0.1

⁶⁴ Inorganic

⁶⁵ Total

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Methiocarb				0.005ab	
Methomyl				0.005b ⁶⁶	
Methoxychlor	0.9a	0.9a	0.04ab	0.0002b ⁶⁷	0.020a
Metolachlor	0.05b	0.05b		0.002b ⁶⁸	0.010a
Metrribuzin	0.08a	0.08a		0.001b ⁶⁹	
Metsulfuron-methyl				0.03a	
Mevinphos				0.005ab	
Microcystin-LR					0.001b
Molinate				0.0005b ⁷⁰	0.006a
Molybdenum				0.05a	0.07a
Monochloramine				3a ⁷¹	3a
Monochloroacetic acid			0.060a ^{ac}		Inadequate Data
Monochlorobenzene	0.08a ⁷²	0.08a	0.1ab		0.300a
Monocrotophos				0.001a	
Napropamide				0.001b ⁷³	
Nickel				0.02a	0.02b
Nitralin				0.5a	
Nitrate (as Nitrogen)	10.0a ⁷⁴	45a ⁷⁵	10ab		

⁶⁶ Health value is 0.03⁶⁷ Health value is 0.3⁶⁸ Health value is 0.3⁶⁹ Health value is 0.05⁷⁰ Health value is 0.005⁷¹ Aesthetic value is 0.5⁷² Aesthetic objective is 0.03⁷³ Health value is 1⁷⁴ Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen)⁷⁵ Equivalent to 10 mg/L as nitrate-nitrogen. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Nitrate (as Nitrate)				50a	50a
Nitrite (as Nitrogen)	1.0a ⁷⁶		1ab		
Nitrite (as Nitrite)				3a	3a ⁷⁷
Nitrate + Nitrite (as Nitrogen)	10.0a ⁷⁸		10ab		
Nitrotriacetic Acid (NTA)	0.4a	0.4a		0.2a	0.200a
Nitrosodimethylamine (NDMA)	0.000009b				
Nitroacetic acid				0.2a	
Norflurazon				0.002b ⁷⁹	
Oryzalin				0.3a	
Oxamyl (Vydate)			0.2ab	0.005b ⁸⁰	
Paraquat	0.01b	0.01b ⁸¹		0.001b ⁸²	
Parathion	0.05a	0.05a		0.01a	
Parathion methyl				0.0003b ⁸³	
Pebulate				0.0005b ⁸⁴	
Pendimethalin				0.3a	0.020a
Pentachlorophenol	0.06a ⁸⁵	0.06a ⁸⁶	0.001a ^a	0.00001b ⁸⁷	0.009b
Permethrin				0.001b ⁸⁸	0.020a

⁷⁶ Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen)

⁷⁷ Nitrate and nitrite values refer to acute. A chronic provisional guideline for nitrite is 0.2

⁷⁸ Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen)

⁷⁹ Health value is 0.05

⁸⁰ Health value is 0.1

⁸¹ Paraquat as dichloride, equivalent to 0.007 mg/L for paraquat ion

⁸² Health value is 0.03

⁸³ Health value is 0.1

⁸⁴ Health value is 0.03

⁸⁵ Aesthetic objective is 0.03

⁸⁶ Aesthetic objective is ≤ 0.03

⁸⁷ Health value is 0.01

⁸⁸ Health value is 0.1

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Phorate	0.002b	0.002a			
Picloram	0.19b	0.19b	0.5ab	0.3a	
Piperonyl butoxide				0.1a	
Pirimicarb				0.005a	
Pirimicarb-ethyl				0.0005a	
Pirimicarb-methyl				0.05a	
Polychlorinated Biphenyls (PCB)	0.003b		0.0005 ^a		
Profenofos				0.0003a	
Promecarb				0.03a	
Promethyne	0.001b				
Propachlor				0.001b ⁸⁹	
Propanil				0.0001b ⁹⁰	0.020a
Propargite				0.05a	
Propazine				0.0005b ⁹¹	
Propiconazole				0.0001b ⁹²	
Propyzamide				0.002b ⁹³	
Pyrazophos				0.03a	0.100a
Pyridate					
Quintozene				0.03a	
Selenium	0.01a	0.01a	0.05ab	0.01a	0.01a
Silver				0.1a	Unnecessary ⁹⁴

⁸⁹ Health value is 0.05⁹⁰ Health value is 0.5⁹¹ Health value is 0.05⁹² Health value is 0.1⁹³ Health value is 0.3⁹⁴ The WHO finds that it is unnecessary to recommend a health-based guideline for this compound because it is not hazardous to human health at concentrations normally found in drinking water.

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Simazine	0.01b	0.01b	0.004ab	0.0005b ⁹⁵	0.002a
Styrene			0.1ab	0.05a ⁹⁶	0.020a
Sulphate				500a ⁹⁷	
Sulprofos				0.01a	
2,4,5-T				0.00005D ⁹⁸	0.009a
2,3,7,8-TCDD (Dioxin)			0.0000003a ⁹		
Temephos	0.28b			0.3ab	
Terbacil				0.01b ⁹⁹	
Terbufos	0.001b	0.001b		0.0005ab	
Terbutylazine (TBA)					0.007a
Terbutyn				0.001b ¹⁰⁰	
Tetrachloroethane					
Tetrachloroethene				0.05a	0.040a
Tetrachloroethene (perchloroethylene)	0.030a	0.03a	0.005a ⁴		
2,3,4,6-Tetrachlorophenol	0.10a ¹⁰¹	0.1a ¹⁰²			
Tetrachlorvinphos				0.002b ¹⁰³	
Thallium			0.002a ¹⁰⁴		

⁹⁵ Health value is 0.02⁹⁶ Aesthetic value is 0.004⁹⁷ Aesthetic value is 250⁹⁸ Health value is 0.1⁹⁹ Health value is 0.03¹⁰⁰ Health value is 0.3¹⁰¹ Aesthetic objective is 0.001¹⁰² Aesthetic objective is ≤ 0.001 ¹⁰³ Health value is 0.1¹⁰⁴ MCLG is 0.0005

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Thiobencarb				0.03a	
Thiometon				0.003a	
Thiophanate				0.005a	
Thiram				0.003a	
Toluene			1ab	0.8a ¹⁰⁵	0.700a
Toxaphene			0.003a ^a		
2,4,5-TP (Silvex)			0.05ab		
Triadimefon				0.1b ¹⁰⁶	
Triallate	0.23a				
Tributyltin oxide				0.001	0.002a
Trichloroacetaldehyde				0.02a	
Trichloroacetic acid			0.06a ¹⁰⁷	0.1a	0.100b
Trichloroacetoneitrile				Insufficient data	0.001b
Trichlorfon				0.005a	
1,2,4-Trichlorobenzene			0.07ab		
Trichlorobenzene (total)				0.03a ¹⁰⁸	0.020a
1,1,1-Trichloroethane			0.2ab ¹⁰⁹	Insufficient data	2.000b
1,1,2-Trichloroethane			0.005a ¹¹⁰		

¹⁰⁵ Aesthetic value is 0.025¹⁰⁶ Health value is 0.002¹⁰⁷ MCLG is 0.3¹⁰⁸ Aesthetic value is 0.005¹⁰⁹ MCLG is 0.20¹¹⁰ MCLG is 0.003

Table A.1. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹
Trichloroethene					0.070b
Trichloroethylene	0.05a	0.05a	0.005a ^a	Insufficient data	
2,4,6-Trichlorophenol	0.005a ¹¹¹	0.005a ¹¹²		0.02a ¹¹³	0.200a
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28a ¹¹⁴				0.009a
Triclopyr				0.01a	
Trifluralin	0.045b	0.045b		0.0001b ¹¹⁵	0.020a
Trihalomethanes	0.100a ¹¹⁶	0.1b	0.080a ^b	0.25a	¹¹⁷
Turbidity	1.0a ¹¹⁸	1.0a ¹¹⁹			
Uranium	0.10a	0.02b			0.002b
Vernolate				0.0005b ¹²⁰	
Vinyl Chloride	0.002a	0.002a	0.002a ^a	0.0003a	0.005a
Xylenes (total)			10ab	0.6 ¹²¹	0.500a

¹¹¹ Aesthetic objective is 0.002

¹¹² Aesthetic objective is ≤ 0.002

¹¹³ Aesthetic value is 0.002

¹¹⁴ Aesthetic objective is 0.02

¹¹⁵ Health value is 0.05

¹¹⁶ This standard is expressed as a running annual average of quarterly samples measured at a point reflecting the maximum residence time in the distribution system.

¹¹⁷ The sum value of the ratio of the concentration of each to its respective guideline value should not exceed 1.

¹¹⁸ A MAC for turbidity of 1.0 NTU (Nephelometric Turbidity Unit) in drinking water leaving the treatment plant was established to ensure the efficiency of the disinfection process. To ensure that the aesthetic quality is not degraded, an AO for turbidity at the free flowing outlet of the ultimate consumer has been set at 5 NTU.

¹¹⁹ A MAC for turbidity of 1.0 NTU (Nephelometric Turbidity Unit) and an aesthetic objective of ≤ 5 NTU at point of consumption

¹²⁰ Health value is 0.03

¹²¹ Aesthetic value is 0.02

^a - MCLG is zero

^b - the total for THMs is 0.080 mg/L (1998 Final Rule for Disinfectants and Disinfectant Byproducts)

^c - the total for the five haloacetic acids is 0.060 mg/L (1998 Final Rule for Disinfectants and Disinfection Byproducts Rule)

Table A.2. Microbiological Standards – Health Related

Parameter	Ontario ¹²²	Canada ¹²³	US	Australia ¹²⁴	WHO
Cryptosporidium			99% removal/ inactivation c	Insufficient data	
Escherichia coli and/or Fecal Coliforms	none ¹²⁵	none	none	none ¹²⁶	none ¹²⁷
General Bacterial Population	Less than 500 colonies per ml ¹²⁸	Less than 500 colonies per ml or less than 200 background coliforms on a total coliform membrane filter	Less than 500 colonies per ml		
Giardia lamblia			99.9 % removal/ inactivation c	Insufficient data	
Legionella			No limit c ¹²⁹	Insufficient data	

¹²² MAC (per 100 ml)¹²³ Currently there are no guidelines for viruses or protozoa. Viruses are currently under consideration. However, it is desirable that no viruses or protozoa are detected.¹²⁴ Australia lists selected bacteria, viruses and protozoa which, if detected in water, require advice to be sought from the relevant health authority.¹²⁵ E. coli is a more definitive indicator of faecal contamination than total coliforms or faecal coliforms.¹²⁶ Minimum sample 100 ml¹²⁷ E. coli or thermotolerant coliform bacteria must not be detectable in any 100 ml sample in all water intended for drinking, treated water entering the distribution system or treated water in the distribution system.¹²⁸ At elevated levels, general bacterial population may interfere with coliform detection. The detection of E. coli or faecal coliforms and elevated general bacterial population levels are indicators of adverse water quality (Section 4.2.2 of the Ontario Drinking Water Standards) and require immediate corrective action (increase chlorine dose and flush system).¹²⁹ US EPA believes that if Giardia and viruses inactivated, Legionella will also be controlled

Table A.2. continued

Parameter	Ontario ¹²²	Canada ¹²³	US	Australia ¹²⁴	WHO
Total Coliforms	¹³⁰	3000 per 100 ml ¹³¹	≤ 5 % ¹³²	none ¹³³	none ¹³⁴
Turbidity			≤ 5 NTU c		
Viruses			99.9 % killed/ inactivated c		

¹³⁰ Referred to section 4.2.2 of the Ontario Drinking Water Standards titled "Indicators of Adverse Water Quality, Notification and Procedure and Corrective Actions." This states that if total coliforms are detected in any required sample other than from raw water, resampling and corrective action are required.

¹³¹ However, because coliforms are not uniformly distributed in water and are subject to considerable variation in enumeration, drinking water fulfilling the following conditions is considered to be in compliance with the coliform MAC: no sample should contain more than 10 total coliform organisms per 100 ml with no fecal coliforms; no consecutive sample from the same site should show the presence of coliform organisms; and, for community distribution drinking water systems, not more than one sample from a set of samples taken from the community on a given day should show the presence of coliform organisms and not more than 10 % of samples based on a minimum of 10 samples should show the presence of coliform organisms.

¹³² No more than 5 % total samples total coliform positive in a month. Positive tests must be analyzed for fecal coliforms. No fecal coliforms are allowed.

¹³³ Minimum sample 100 ml

¹³⁴ Total coliform bacteria must not be detectable in any 100 ml sample in treated water entering the distribution system or treated water in the distribution system. In the case of large supplies where sufficient samples are examined, they must not be present in 95 % of samples throughout any 12 month period.

Table A.3. Radionuclide Standards – Health Related
Natural Radionuclides¹³⁵

<i>Parameter</i>		<i>Parameter</i>		<i>Parameter</i>	
Beryllium-7	4000	Radium-226	0.6	Thorium-234	20
Bismuth-210	70	Radium-228	0.5	Uranium-234	4
Lead-210	0.1	Thorium-228	2	Uranium-235	4
Polonium-210	0.2	Thorium-230	0.4	Uranium-238	4
Radium-224	2	Thorium-232	0.1		

Artificial Radionuclides¹³⁶

Americium-241	0.2	Iodine-125	10	Selenium-75	70
Antimony-122	50	Iodine-129	1	Silver-108m	70
Antimony-124	40	Iodine-131	6	Silver-110m	50
Antimony-125	100	Iron-55	300	Silver-111	70
Barium-140	40	Iron-59	40	Sodium-22	50
Bromine-82	300	Managnae-54	200	Strontium-85	300
Calcium-45	200	Mercury-197	400	Strontium-89	40
Calcium-47	60	Mercury-203	80	Strontium-90	5
Carbon-14	200	Molybdenum-99	70	Sulphur-35	500
Cerium-141	100	Neptunium-239	100	Technetium-99	200
Cerium-144	20	Niobium-95	200	Technetium-99m	7000
Cesium-133	2000	Phosphorous-32	50	Tellurium-129m	40
Cesium-134	7	Plutonium-238	0.3	Tellurium-131m	40
Cesium-136	50	Plutonium-239	0.2	Tellurium-132	40
Cesium-137	10	Plutonium-240	0.2	Thallium-201	2000
Chromium-51	3000	Plutonium-241	10	Tritium	7000
Cobalt-57	40	Rhodium-105	300	Ytterbium-169	100
Cobalt-58	20	Rubidium-81	3000	Yttrium-90	30
Cobalt-60	2	Rubidium-86	50	Yttrium-91	30
Gallium-67	500	Ruthenium-103	100	Zinc-65	40
Gold-198	90	Ruthenium-106	10	Zirconium-95	100
Indium-111	400				

¹³⁵ MAC Becquerel per litre (Bq/L)¹³⁶ MAC (Bq/L)

US		Australia		WHO
<i>Parameter</i>		<i>Parameter</i>		
Alpha Particles	15 pCi/La ^a	Gross alpha activity	0.1 Bq/L	0.1 Bq/L
Beta Particles and photon emitters	4 mrem/year a ^a	Gross beta activity	0.5 Bq/L	1 Bq/L
Radium 226 and Radium 228 (combined)	5 pCi/La ^a			
Uranium	30 mg/L ^b			

^a MCLG will be zero as of 12/08/03^b MCL as of 12/08/03 and MCLG will be zero as of 12/08/03

Table A.4. Chemical/Physical Objectives (mg/L) – Not Health Related

Parameter	Ontario	Canada	US	Australia	WHO ¹³⁷
Alkalinity (as CaCO ₃)	30-500c				
Aluminium (Aluminium)	0.10c		0.05-0.2d	0.2d	0.2
Ammonia				0.5d	1.5
Chloride	250d	≤ 250d	250d	250d	250
Chlorine					0.600-1.000
2-chlorophenol					0.0001-0.010
Colour	5 TCUd ¹³⁸	≤ 15 TCUd	15 Cu d ¹³⁹	15 Hazen Units d	15 TCU
Copper	1.0d	≤ 1.0 ¹⁴⁰	1.0d	1d	1
Corrosivity			Non-corrosive		
1,2-Dichlorobenzene					0.001-0.010
1,3-Dichlorobenzene					
1,4-Dichlorobenzene					0.0003-0.030
2,4-dichlorophenol					0.0003-0.040
2,4,6-dichlorophenol					0.002-0.300
Dissolved Organic Carbon	5.0d				
Dissolved Oxygen				> 85 % d	
Ethylbenzene	0.0024d	≤ 0.0024d			0.002-0.200
Fluoride			2.0d		
Foaming agents			0.5d		
Hardness (as CaCO ₃)	80-100c				
Hydrogen Sulphide				0.05d	0.05
Iron	0.30d	≤ 0.3d	0.3d		0.3
Manganese	0.05d	≤ 0.05d	0.05d		0.1

¹³⁷ Level at which likely to give rise to consumer complaints. As such, this represents the upper limits, rather than a maximum value.

¹³⁸ Total colour units (TCU)

¹³⁹ 15 colour units

¹⁴⁰ At point of consumption

Table A.4. continued

Parameter	Ontario	Canada	US	Australia	WHO ¹³⁷
Methane	3L/m ³ d				
Monochlorobenzene			0.040/0.020 ¹⁴¹		0.010-0.120
MtBE					
Odour	Inoffensive d	Inoffensive d	3 ¹⁴²	Acceptable to most people d	Should be acceptable
Organic Nitrogen	0.15c				
pH ¹⁴³	6.5-8.5c	6.5-8.5d	6.5-8.5d	6.5-8.5d	<8 ¹⁴⁴
Silver			0.1d		
Sodium	200d ¹⁴⁵	≤ 200d		180d	200
Styrene					0.004-2.600
Sulphate	500d ¹⁴⁶	≤ 500d ¹⁴⁷	250d		250
Sulphide	0.05d	≤ 0.05d			
Taste	Inoffensive d	Inoffensive d		Acceptable to most people d	Should be acceptable
Temperature	15°Cd	≤ 15°Cd			Should be acceptable
Toluene	0.024d	≤ 0.024d			0.024-0.170
Total Dissolved Solids	500d	≤ 500d	500d	500d	1000
Trichlorobenzenes (total)					0.005-0.050
Turbidity				5 NTU d	5 NTU
Xylenes	0.30d	≤ 0.30d			0.020-1.800
Zinc	5.0d	≤ 5.0d	5.0d	3d	3

¹⁴¹ Taste and odour threshold respectively in the consumer acceptability advisory table

¹⁴² Units are threshold odor numbers

¹⁴³ No units

¹⁴⁴ For effective disinfection with chlorine

¹⁴⁵ The local Medical Officer of Health should be notified when sodium concentration exceeds 20 mg/L so that the information can be communicated to local physicians for their use with patients on sodium restricted diets

¹⁴⁶ Higher sulphate levels than this may have a laxative effect on some people

¹⁴⁷ Ibid

Ontario and Canada: a = MAC; b = IMAC; c = OG; d = AO

US: a = MCL; b = MCLG; c = TT; d = SDWR

Australia: a = health value; b = guideline; d = aesthetic value

WHO: a = guideline; b = provisional guideline

MAC is a Maximum Acceptable Concentration

IMAC is an Interim Maximum Acceptable Concentration

OG is an Operational Guideline

AO is an Aesthetic Objective

MCL is a maximum contaminant level

MCLG is a maximum contaminant level goal

TT is a treatment technique, which is a required process intended to reduce the level of a contaminant in drinking water

SDWR is a secondary drinking water regulation that is a non-enforceable federal guideline regarding cosmetic or aesthetic effects

Although the US does not have as many standards for chemical contaminants, they have many more chemicals listed with Health Advisories outlined for children and adults as well as daily, 10-day and lifetime exposure rates. The chemicals are further rated for cancer risk and group

Sources:

Australian Guidelines, 2001, http://www.nhmrc.gov.au/publications/pdf/eh19_2001.pdf

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Canada Guidelines, 1996, http://www.hc-sc.gc.ca/ehp/ehd/catalogue/bcd_pubs/summary.pdf

Ontario Drinking Water Standards, 2000

US Standards, 2002, <http://www.epa.gov/safewater/mdl.html>

WHO, 1998, http://www.who.int/water_sanitation_health/GDWQ/Summary_tables/Sumtab.htm

