



fact sheet

Summary of Massachusetts Drinking Water Program Testing Requirements for Public Water Systems

This fact sheet summarizes drinking water testing requirements, maximum contaminant levels (MCLs), and Maximum Residual Disinfectant Levels (MRDLs) in the State of Massachusetts. These MCLs, MRDLs, and drinking water standards have been established by the U.S. Environmental Protection Agency or the State of Massachusetts for the protection of the public health.

These requirements apply to all public water systems in the state - systems serving drinking water to at least 25 individuals (or 15 service connections) at least 60 days of the year. There are two main types of public water systems:

- **Community Water Systems** - primarily serve year-round residents; and
- **Non-Community Systems** - serve water to non-residential customers and may include restaurants, factories, schools and hospitals.

Non-community systems that regularly serve at least 25 of the same people, for approximately four or more hours a day, four or more days per week, for more than six months or 180 days of the year are called **Non-Transient Non-Community Water Systems (NTNCs)** and are regulated more stringently than **Transient Non-Community Water Systems (TNCs)**.

The standards listed apply to water, which is delivered to the user's tap. Most samples are collected from the point of entry to the distribution system (after any treatment); however, some measurements including those for disinfectants, some disinfection byproducts (trihalomethanes and haloacetic acids), bacteria, lead and copper are conducted out in the distribution system. For lead and copper, the MCL has been replaced with an "action level" and is measured at the consumer's tap.

Determining compliance with these standards differs with each contaminant. The regulations and the individual system's approved sampling plan must be consulted for more specific information. In certain cases, MassDEP may require more frequent testing than specified.

MassDEP also utilizes health-based guidance numbers for chemicals for which standards have not been established. These are determined by the MassDEP Office of Research and Standards (ORS) and applied on a case-by-case basis. The list of guidance values (ORSG) is updated periodically.

Also included is a list of the federal and state secondary contaminant levels. These are aesthetic standards but they may be enforced on a case by case basis.

Copies of the Massachusetts Drinking Water Regulations, 310 CMR 22.00, are available at

<http://www.mass.gov/eea/agencies/massdep/water/regulations/310-cmr-22-00-massachusetts-drinking-water-regulations.html>. If you have any questions on this information please contact the MassDEP Drinking Water Program at 617-292-5770, or Program.Director-DWP@state.ma.us.

Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108-4746

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Inorganic Compounds (310 CMR 22.06, 310 CMR 22.06A, CMR 22.06B, CMR 22.06C)

Parameter	CASRN*	MCL	Monitoring Requirements
Antimony	7440360	0.006 mg/l	Monitoring frequency depends on MassDEP-approved sampling plan. Community and non-transient non-community water supply sources monitoring frequency ranges from once per year for surface water sources to once every three years for groundwater sources. Non-vulnerable sources may be granted waivers and sample once every nine years.
Arsenic	7440382	0.010 mg/l	
Asbestos ¹	1332214	7 million fibers/l	
Barium	7440393	2 mg/l	
Beryllium	7440417	0.004 mg/l	
Cadmium	7440439	0.005 mg/l	
Chromium	7440473	0.1 mg/l	
Cyanide	57125	0.2 mg/l	
Fluoride ²	7782414	4 mg/l	
Lead (action level)	7439921	0.015 mg/l	
Copper (action level)	7440508	1.3 mg/l	
Mercury	7439976	0.002 mg/l	
Nitrate (as N) ³	14797558	10 mg/l	
Nitrite (as N) ³	14797650	1 mg/l	
Total Nitrate & Nitrite (as N)	--	10 mg/l	
Perchlorate	14797730	0.0020 mg/l	
Selenium	7782492	0.05 mg/l	
Sodium ⁴	7440235	4 mg/l	
Thallium	7440280	0.002 mg/l	

¹Statewide waivers have been approved by the U.S. EPA for source waters.

²There is also a secondary MCL for fluoride which is 2.0 mg/l.

³Transient Non-Community systems (TNC) are required to monitor for these contaminants.

⁴Sodium MCL is based on an 8 ounce serving.

Volatile Organic Compounds (310 CMR 22.07B)

Parameter	CASRN	MCL	Monitoring Requirements
Benzene	71432	0.005 mg/l	Monitoring frequency depends on MassDEP-approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters every three years. Waivers may be granted to non-vulnerable sources to monitor once every three years. Monitoring for the following unregulated VOCs is also required:
Carbon tetrachloride	56235	0.005 mg/l	
Dichloromethane	75092	0.005 mg/l	
1,2-Dichlorobenzene (o-DCB)	95501	0.6 mg/l	
1,4-Dichlorobenzene(P-DCB)	106467	0.005 mg/l	
1,2-Dichloroethane	107062	0.005 mg/l	
1,2-Dichloroethylene (<i>cis</i>)	156592	0.07 mg/l	
1,2-Dichloroethylene (<i>trans</i>)	156605	0.1 mg/l	
1,1-Dichloroethylene	75354	0.007 mg/l	
1,2-Dichloropropane	78875	0.005 mg/l	
Ethylbenzene	100414	0.7 mg/l	
Methyl tert-Butyl Ether (MTBE) ⁵	1634044	0.07 mg/l ⁵	
Monochlorobenzene	108907	0.1 mg/l	
Styrene	100425	0.1 mg/l	
Tetrachloroethylene	127184	0.005 mg/l	
Toluene	108883	1 mg/l	
Trichloroethylene	79016	0.005 mg/l	
1,1,1-Trichloroethane	71556	0.2 mg/l	
1,2,4-Trichlorobenzene	120821	0.07 mg/l	
1,1,2-Trichloroethane	79005	0.005 mg/l	
Vinyl Chloride	75014	0.002 mg/l	
Xylenes (total)	1330207	10 mg/l	

⁵MTBE has an ORSG not an MCL

* Chemical Abstract Service Registry Number

Synthetic Organic Compounds (310 CMR 22.07A)

Parameter	CASRN	MCL	Monitoring Requirements
Alachlor	15972608	0.002 mg/l	Monitoring frequency depends on MassDEP-approved sampling plan. Community and non-transient non-community water supply sources must initially monitor for four consecutive quarters. Non-vulnerable sources may be granted monitoring waivers.
Atrazine	1912249	0.003 mg/l	
Benzo(a)pyrene	50328	0.0002 mg/l	
Carbofuran	1563662	0.04 mg/l	
Chlordane	57749	0.002 mg/l	
Dalapon	75990	0.2 mg/l	
Di(2-ethylhexyl) adipate	103231	0.4 mg/l	
Di(2-ethylhexyl) phthalate	117817	0.006 mg/l	
Dinoseb	88857	0.007 mg/l	
Diquat ⁶	85007	0.02 mg/l	
1,2-Dibromo-3-chloropropane (DBCP) ⁷	96128	0.0002 mg/l	
2,4-D (2,4-Dichlorophenoxyacetic acid)	94757	0.07 mg/l	
Endothall ⁵	145733	0.1 mg/l	
Endrin	72208	0.002 mg/l	
Ethylene dibromide (EDB)	106934	0.00002 mg/l	
Glyphosate ⁶	1071536	0.7 mg/l	
Heptachlor	76448	0.0004 mg/l	
Heptachlor epoxide	1024573	0.0002 mg/l	
Hexachlorobenzene	118741	0.001 mg/l	
Hexachlorocyclopentadiene	77474	0.05 mg/l	
Lindane	58899	0.0002 mg/l	
Methoxychlor	72435	0.04 mg/l	
Oxamyl (Vydate)	2313522	0.2 mg/l	
Polychlorinated biphenyls (PCBs)	1336363	0.0005 mg/l	
Pentachlorophenol	87865	0.001 mg/l	
Picloram	1918021	0.5 mg/l	
Simazine	122349	0.004 mg/l	
2,3,7,8-TCDD (Dioxin) ⁶	1746016	3x10 ⁻⁸ mg/l	
Toxaphene	8001352	0.003 mg/l	
2,4,5-TP (Silvex)	93721	0.05 mg/l	

⁶Statewide waivers have been approved by the U.S. EPA for both ground and surface waters.

⁷Statewide waivers have been approved by the U.S. EPA for surface waters.

Turbidity (310 CMR 22.08)

Parameter	MCL	Monitoring Requirements
Turbidity	1 NTU (Nephelometric turbidity unit)	Applies to Community and Non-community systems using filtered or unfiltered surface water sources. Monitoring is required daily. Non-community systems may reduce sampling if granted MassDEP approval to do so.

Disinfectants/Disinfection Byproducts (310 CMR 22.07E)

Parameter	CASRN	MCL	Monitoring Requirements
Chlorine (as Cl ₂)	7782505	4.0 mg/l	Monitoring frequency depends on MassDEP-approved sampling plan and type of treatment being used. Applies to Community and non-transient non-community systems which add a chemical disinfectant (oxidant) to the water. ⁸ Also applies to Transient non-community (TNC) systems.
Chloramines (as Cl ₂)	--	4.0 mg/l	
Chlorine dioxide (as ClO ₂) ⁸	10049044	0.8 mg/l	
<i>Total Trihalomethanes:</i> chloroform	67663	0.080 mg/l	
bromodichloromethane	75274		
dibromochloromethane	124481		
bromoform	75252		
<i>Haloacetic Acids (five):</i> monochloroacetic acid	79118	0.060 mg/l	
dichloroacetic acid	79436		
trichloroacetic acid	76039		
monobromoacetic acid	79083		
dibromoacetic acid	631641		
Bromate	15541454	0.010 mg/l	
Chlorite	7758192	1.0 mg/l	

Bacteria (310 CMR 22.05, 310 CMR 22.26)

Parameter and MCL	Monitoring Requirements
<p>Coliform Bacteria</p> <p>A) MCL- More than one total coliform-positive sample if collecting 40 or fewer samples per month, or more than 5% positive if collecting more than 40 samples per month.</p> <p>B) Acute MCL - Any <i>E.coli</i>-positive or fecal coliform-positive repeat sample, or any total coliform-positive repeat sample following an <i>E.coli</i>-positive routine sample.</p>	Applies to all systems. The number of samples collected depends on the population served (see 310 CMR 22.05, Table 1-22.05). The range is from 1/month for systems serving ≤ 1,000 persons to 480/month for systems serving > 3,960,000. Non-community systems must sample no less than quarterly.
<p>Ground Water Rule (GWR)</p> <p>Fecal indicators – <i>E coli</i>, enterococci, and coliphage (See 310CMR 22.26(3)(a)3 to determine the applicable fecal indicator for your system)</p> <p>MCL - Any fecal indicator positive sample in a ground water source that does not have MassDEP certified 4-log treatment for viruses.</p>	Applies to all systems with ground water sources that do not have MassDEP certified 4-log treatment. Monitoring is <i>triggered</i> if the source has a confirmed positive Total Coliform Rule (TCR) distribution sample. One (1) raw water sample is required for each of the ground water sources in use at the time of the TCR positive result. <i>Representative sampling may be allowed with prior MassDEP approval.</i> If the initial sample (s) is positive 5 additional samples are required.

Radionuclides (310 CMR 22.09A)

Parameter	CASRN	MCL	Monitoring Requirements
Gross Alpha Particle Activity ⁹	--	15 pCi/l	Community systems must monitor for 4 consecutive quarters prior to December 31, 2007. Grandfathering of historic data or no detections during the first two quarters may reduce this requirement. Future monitoring requirements are based on the results of this initial period. ⁹ Includes radium-226 but excludes radon and uranium. ¹⁰ If the gross alpha particle activity is ≤ 5 pCi/l, it may be substituted for the required radium-226 analysis. If the gross alpha particle activity is ≤ 15 pCi/l, it may be substituted for the required uranium analysis. ¹¹ Monitoring is required only at those systems designated by MassDEP.
Combined Radium-226 ¹⁰ and Radium-228	7440144	5 pCi/l	
Uranium ¹⁰	7440611	30 ug/l	
Beta Particle Activity ¹¹	--	4 mrem/yr	
Photon Radioactivity ¹¹	--	4 mrem/yr	
Average Annual Concentrations which produces a body or organ dose of 4 mrem/yr			
Tritium	10028178	20,000 pCi/l	
Strontium-90	10098972	8 pCi/l	

Massachusetts Drinking Water Guidelines

This list of public water supply guidelines are for chemicals that do not have MCLs/MRDLs. MassDEP's Office of Research and Standards (ORS) derives these guidelines, and adopts or revises U.S. EPA health advisories (HA) and proposed MCLs. New guidelines are evaluated on a case-by-case, ongoing basis and may be incorporated into the list at any time.

For information on the derivation of the guidelines, and for general information on the health effects of water contaminants, please contact ORS at 617-292-5570 or visit

<http://www.mass.gov/eea/agencies/massdep/water/drinking/standards/office-of-research-standards-drinking-water-guidelines.html>.

Parameter	CASRN	Guideline (mg/l)	Monitoring Requirements	
Acetone	67641	6.3	On a case by case basis MassDEP may require systems to monitor for one or more of the chemicals.	
Aldicarb	116063	0.003		
Aldicarb sulfone	1646884	0.002		
Aldicarb sulfoxide	1646873	0.004		
Bromomethane	74839	0.01		
Chloroform ¹²	67663	0.07		
Dichlorodifluoromethane	75718	1.4		
1,1-Dichloroethane	75343	0.07		
1,3-Dichloropropene	542756	0.0004		
1,4-Dioxane	123911	0.003		
Ethylene glycol	107211	14		
Manganese ¹³	7439965	0.300		
Methyl ethyl ketone	78933	0.35		
Methyl isobutyl ketone	108101	4.0		
Methyl tertiary-Butyl Ether	1634044	0.07		
Metolachlor	51218452	0.1		
Naphthalene	91203	0.140		
Nickel	7440020	0.1		
Petroleum Hydrocarbons TPH (Total petroleum hydrocarbons)	N/A	0.2		¹² Non-chlorinated supplies only. ¹³ The SMCL is 0.05 mg/l. The EPA and ORS HA levels are: 0.300 mg/l for lifetime exposure and 1.000 mg/l for short term exposure. Sensitive populations should not be given water with levels over 0.300 mg/l.
Aliphatics	C5-C8	30080	¹⁴ The overlap in the C9-C12 range is the result of the VPH and EPH analytical methods used to quantitate these ranges of petroleum hydrocarbons in drinking water. The choice of the most appropriate range to use is based on the identity of the petroleum product of concern and is therefore determined on a case-specific basis.	
	C9-C12 ¹⁴	30089		
	C9-C18 ¹⁴	30092		
	C19-C36	30057		
Aromatics	C9-C10	30087	¹⁵ EPA has proposed an MCL of 300 pCi/l.	
	C11-C22	30048		
Radon-222 ¹⁵	14859677	10,000 pCi/l	¹⁶ The sodium guideline is based on an 8-ounce serving.	
Sodium ¹⁶	7440235	20		
Tetrahydrofuran	109999	1.3		
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	76131	210		
Tertiary Amyl Methyl Ether (TAME)	994058	0.09		
Tertiary Butyl Alcohol (TBA)	75650	0.12		

Massachusetts Secondary Standards (310 CMR 22.07D)

Massachusetts has secondary standards for drinking water. The parameters listed below are not known to cause a health risk at or below the secondary standard, but may affect the taste, color, and/or odor of drinking water.

Parameter	CASRN	Secondary MCL (mg/l)	Monitoring Requirements
Aluminum	7429905	0.05 to 0.2	<p>Secondary standards are used to determine aesthetic quality and enhance water operations as such MassDEP strongly recommends that systems annually monitor for all secondary standards.</p> <p>On a case by case basis MassDEP may require systems to monitor for secondary standards.</p> <p>¹⁷ See Page 5. Manganese also has an EPA and ORS Health Advisory Level of 0.300 mg/l for lifetime exposure and 1.000 mg/l for short term exposure. Sensitive populations should not be given water with levels over 0.300 mg/l.</p> <p>¹⁸ Based on EPA's Drinking Water Advisory using taste and odor thresholds.</p> <p>¹⁹ EPA has proposed an MCL of 500 mg/l.</p>
Chloride	7647145	250	
Color	N/A	15 color units	
Copper	7440508	1	
Corrosivity	N/A	Non-corrosive	
Fluoride	7782414	2	
Foaming agents	N/A	0.5	
Iron	7439896	0.3	
Manganese ¹⁷	7439965	0.05	
Methyl tertiary-Butyl Ether ¹⁸	1634044	0.020 – 0.040	
Odor	N/A	3 threshold odor numbers	
pH	N/A	6.5 to 8.5	
Silver	7440224	0.10	
Sulfate ¹⁹	7757826	250	
Total dissolved solids (TDS)	N/A	500	
Zinc	7440666	5	