

MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants

Updated November 2024

The following tables include California’s maximum contaminant levels (MCLs), detection limits for purposes of reporting (DLRs), public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA). For comparison, Federal MCLs and Maximum Contaminant Level Goals (MCLGs) from the U.S. EPA are also displayed. Previous MCLs that are no longer effective are shown in *italics*. Regulatory citations refer to Title 22 of the [California Code of Regulations \(22 CCR\)](#) and Title 40 of the [Code of Federal Regulations \(40 CFR\)](#).

This document refers to several units of measurement commonly used in assessing water quality. Concentrations of substances in drinking water are typically expressed in milligrams per liter (mg/L), micrograms per liter (µg/L), nanograms per liter (ng/L), and picocuries per liter (pCi/L). These units help quantify the presence of various chemicals, metals, or radioactive materials. For reference, 1 mg/L equals 1,000 µg/L, and 1 µg/L equals 1,000 ng/L, providing a clear scale for understanding the quantities discussed. Picocuries per liter (pCi/L) measure radioactive material, where 1 pCi/L represents a trillionth of a curie, a standard unit for radioactivity.

Inorganic Chemicals

The information in the following table can be found in [22 CCR §64431](#) (California MCLs), [22 CCR §64432](#) (California DLRs), [OEHHA’s website](#) (California PHGs), [40 CFR §141.23](#) (U.S. EPA MCLs), and [40 CFR §141.51](#) (U.S. EPA MCLGs). The values in this table are in **units of micrograms per liter (µg/L)** unless otherwise stated.

Inorganic Chemicals	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Aluminum	1,000	1989-02-25	50	600	2001	--	--	--
Antimony	6	1994-09-08	6	1	2016	6	1994-01-17	6
Arsenic	10 <i>50</i>	2008-11-28 <i>1977</i>	2	0.004	2004	10 <i>50</i>	2006-01-23 <i>1977-06-24</i>	zero
Asbestos ¹	7	1994-09-08	0.2	7	2003	7	1992-07-30	7

¹ Asbestos units are in million fibers per liter (MFL); for fibers >10 microns long.

Inorganic Chemicals	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Barium	1,000	1977	100	2,000	2003	2,000 1,000	1992-07-30 1977-06-24	2000
Beryllium	4	1994-09-08	1	1	2003	4	1994-01-17	4
Cadmium	5 10	1994-09-08 1977	1	0.04	2006	5 10	1992-07-30 1977-06-24	5
Chromium, Hexavalent	10	2024-10-01	0.1	0.02	2011	--	--	--
Chromium, Total	50	1977	10	none ²	--	100 50	1992-07-30 1997-06-24	100
Cyanide	150 200	2003-06-12 1994-09-08	100	150	1997	200	1994-01-17	200
Fluoride	2,000	1998-04	100	1,000	1997	4,000	1987-10-02	4000
Mercury (inorganic)	2	1977	1	1.2	1999	2	1977-06-24	2
Nickel	100	1994-09-08	10	12	2001	--	Remanded	--
Nitrate (as nitrogen, N)	10,000 as N	1977	400	10,000 as N ³	2018	10,000	1977-06-24	10 mg/L
Nitrite (as N)	1,000 as N	1994-09-08	400	1,000 as N	2018	1,000	1992-07-30	1 mg/L
Nitrate + Nitrite (as N)	10,000 as N	1994-09-08	--	10,000 as N	2018	10,000	1992-07-30	10,000
Perchlorate	6	2007-10-18	1	1	2015	--	--	--
Selenium	50 10	1994-09-08 1977	5	30	2010	50 10	1992-07-30 1977-06-24	50
Thallium	2	1994-09-08	1	0.1	1999	2	1994-01-17	0.5

² In November 2001, OEHHA withdrew the 0.0025 mg/L PHG adopted in 1999.

³ The PHG for nitrate can also be expressed as 45 mg/L as NO₃.

Volatile Organic Chemicals (VOCs)

The information in the following table can be found in [22 CCR §64444](#) (California MCLs), [22 CCR §64445.1](#) (California DLRs), [OEHHA's website](#) (California PHGs), [40 CFR §141.61](#) (U.S. EPA MCLs), and [40 CFR §141.50](#) (U.S. EPA MCLGs). The values in this table are in **units of micrograms per liter (µg/L)**.

Volatile Organic Chemicals (VOCs)	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Benzene	1	1989-02-25	0.5	0.15	2001	5	1989-01-09	zero
Carbon tetrachloride	0.5	1989-04-05	0.5	0.1	2000	5	1989-01-09	zero
1,2-Dichlorobenzene	600	1994-09-08	0.5	600	1997	600	1992-07-30	600
1,4-Dichlorobenzene (p-DCB)	5	1989-04-05	0.5	6	1997	75	1989-01-09	75
1,1-Dichloroethane (1,1-DCA)	5	1990-06-24	0.5	3	2003	--	--	--
1,2-Dichloroethane (1,2-DCA)	0.5	1989-04-05	0.5	0.4	1999	5	1989-01-09	zero
1,1-Dichloroethylene (1,1-DCE)	6	1989-02-25	0.5	10	1999	7	1989-01-09	7
cis-1,2-Dichloroethylene	6	1994-09-08	0.5	13	2018	70	1992-07-30	70
trans-1,2-Dichloroethylene	10	1994-09-08	0.5	50	2018	100	1992-07-30	100
Dichloromethane (Methylene chloride)	5	1994-09-08	0.5	4	2000	5	1994-01-17	zero
1,2-Dichloropropane	5	1990-06-24	0.5	0.5	1999	5	1992-07-30	zero
1,3-Dichloropropene	0.5	1989-02-25	0.5	0.2	1999	--	--	--
Ethylbenzene	300 700 680	2003-06-12 1994-09-08 1989-02-25	0.5	300	1997	700	1992-07-30	700
Methyl tertiary butyl ether (MTBE)	13	2000-05-17	3	13	1999	--	--	--
Monochlorobenzene	70 30	1994-09-08 1989-02-25	0.5	70	2014	100	1992-07-30	100
Styrene	100	1994-09-08	0.5	0.5	2010	100	1992-07-30	100
1,1,2,2-Tetrachloroethane	1	1989-02-25	0.5	0.1	2003	--	--	--
Tetrachloroethylene (PCE)	5	1989-05	0.5	0.06	2001	5	1992-07-30	zero
Toluene	150	1994-09-08	0.5	150	1999	1,000	1992-07-30	1,000

Volatile Organic Chemicals (VOCs)	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
1,2,4-Trichlorobenzene	5 70	2003-06-12 1994-09-08	0.5	5	1999	70	1994-01-17	70
1,1,1-Trichloroethane (1,1,1-TCA)	200	1989-02-25	0.5	1000	2006	200	1989-01-09	200
1,1,2-Trichloroethane (1,1,2-TCA)	5 32	1994-09-08 1989-04-05	0.5	0.3	2006	5	1994-01-17	3
Trichloroethylene (TCE)	5	1989-02-25	0.5	1.7	2009	5	1989-01-09	zero
Trichlorofluoromethane (Freon 11)	150	1990-06-24	5	1,300	2014	--	--	--
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1,200	1990-06-24	10	4,000	1997	--	--	--
Vinyl chloride	0.5	1989-04-05	0.5	0.05	2000	2	1989-01-09	zero
Xylenes	1,750	1989-02-25	0.5	1,800	1997	10,000	1992-07-30	10,000

Synthetic Organic Chemicals (SOCs)

The information in the following table can be found in [22 CCR §64444](#) (California MCLs), [22 CCR §64445.1](#) (California DLRs), [OEHHA's website](#) (California PHGs), [40 CFR §141.61](#) (U.S. EPA MCLs), and [40 CFR §141.50](#) (U.S. EPA MCLGs). The values in this table are in **units of micrograms per liter (µg/L)**.

Synthetic Organic Chemicals (SOCs)	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Alachlor	2	1994-09-08	1	4	1997	2	1992-07-30	zero
Atrazine	1 3	2003-06-12 1989-04-05	0.5	0.15	1999	3	1992-07-30	3
Bentazon	18	1989-04-05	2	200	1999	--	--	--
Benzo(a)pyrene	0.2	1994-09-08	0.1	0.007	2010	0.2	1994-01-17	zero
Carbofuran	18	1990-06-24	5	0.7	2016	40	1992-07-30	40
Chlordane	0.1	1990-06-24	0.1	0.03	1997	2	1992-07-30	zero

Synthetic Organic Chemicals (SOCs)	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Dalapon	200	1994-09-08	10	790	1997	200	1994-01-17	200
1,2-Dibromo-3-chloropropane (DBCP)	0.2 0.1	1991-05-03 1989-07-26	0.01	0.003	2020	0.2	1992-07-30	zero
2,4-Dichlorophenoxyacetic acid (2,4-D)	70 100	1994-09-08 1977	10	20	2009	70 100	1992-07-30 1977-06-24	70
Di(2-ethylhexyl)adipate	400	1994-09-08	5	200	2003	400	1994-01-17	400
Di(2-ethylhexyl)phthalate (DEHP)	4	1990-06-24	3	12	1997	6	1994-01-17	zero
Dinoseb	7	1994-09-08	2	14	1997	7	1994-01-17	7
Diquat	20	1994-09-08	4	6	2016	20	1994-01-17	20
Endothal	100	1994-09-08	45	94	2014	100	1994-01-17	100
Endrin	2 0.2	1994-09-08 1977	0.1	0.3	2016	2 0.2	1994-01-17 1977-06-24	2
Ethylene dibromide (EDB)	0.05 0.02	1994-09-08 1989-02-25	0.02	0.01	2003	0.05	1992-07-30	zero
Glyphosate	700	1990-06-24	25	900	2007	700	1994-01-17	700
Heptachlor	0.01	1990-06-24	0.01	0.008	1999	0.4	1992-07-30	zero
Heptachlor epoxide	0.01	1990-06-24	0.01	0.006	1999	0.2	1992-07-30	zero
Hexachlorobenzene	1	1994-09-08	0.5	0.03	2003	1	1994-01-17	zero
Hexachlorocyclopentadiene	50	1994-09-08	1	2	2014	50	1994-01-17	50
Lindane	0.2 4	1994-09-08 1977	0.2	0.032	1999	0.2 4	1992-07-30 1977	0.2
Methoxychlor	30 40 100	2003-06-12 1994-09-08 1977	10	0.09	2010	40 100	1992-07-30 1977-06-24	40
Molinate	20	1989-04-05	2	1	2008	--	--	--
Oxamyl	50 200	2003-06-12 1994-09-08	20	26	2009	200	1994-01-17	200

Synthetic Organic Chemicals (SOCs)	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Pentachlorophenol	1	1994-09-08	0.2	0.3	2009	1	1992-07-30	zero
Picloram	500	1994-09-08	1	166	2016	500	1994-01-17	500
Polychlorinated biphenyls (PCBs)	0.5	1994-09-08	0.5	0.09	2007	0.5	1992-07-30	zero
Simazine	4 10	1994-09-08 1989-04-05	1	4	2001	4	1994-01-17	4
Thiobencarb	70	1989-04-05	1	42	2016	--	--	--
Toxaphene	3 5	1994-09-08 1977	1	0.03	2003	3 5	1992-07-30 1977-06-24	zero
1,2,3-Trichloropropane	0.005	2017-12-14	0.005	0.0007	2009	--	--	--
2,3,7,8-TCDD (dioxin)	0.00003	1994-09-08	5×10^{-6}	5×10^{-8}	2010	0.00003	1994-01-17	zero
2,4,5-TP (Silvex)	50 10	1994-09-08 1977	1	3	2014	50 10	1992-07-30 1977-06-24	50

Disinfectant Residuals

Standards for disinfectant residuals are called “Maximum Residual Disinfectant Levels” (MRDLs) instead of MCLs. Similarly, goals are called “Maximum Residual Disinfectant Level Goals” (MRDLGs). The information in the following table can be found in [22 CCR §64533.5](#) (California MRDLs), [40 CFR §141.65](#) (U.S. EPA MRDLs), and [40 CFR §141.54](#) (U.S. EPA MRDLGs). The values in this table are in **units of milligrams per liter (mg/L)**.

Disinfectant Residuals	California					U.S. EPA		
	MRDL	MRDL Effective Date	DLR	PHG	PHG Date	MRDL	MRDL Effective Date	MRDLG
Chlorine	4.0 (as Cl ₂)	2006-06-17	--	--	--	4.0	1999-02-16	4
Chloramines	4.0 (as Cl ₂)	2006-06-17	--	--	--	4.0	1999-02-16	4
Chlorine dioxide	0.8 (as ClO ₂)	2006-06-17	--	--	--	0.8	1999-02-16	0.8

Disinfection Byproducts

The information in the following table can be found in [22 CCR §64533](#) (California MCLs and DLRs), [OEHHA's website](#) (California PHGs), [40 CFR §141.64](#) (U.S. EPA MCLs), and [40 CFR §141.53](#) (U.S. EPA MCLGs). The values in this table are in **units of micrograms per liter (µg/L)**.

Disinfection Byproducts	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Total Trihalomethanes	80 100	2006-06-17 1983-03-14	--	--	--	80 100	2002-01-01 1983-11-29	--
Bromodichloromethane	--	--	1	0.06	2020	--	--	zero
Bromoform	--	--	1	0.5	2020	--	--	zero
Chloroform	--	--	1	0.4	2020	--	--	70
Dibromochloromethane	--	--	1	0.1	2020	--	--	60
Haloacetic Acids (five) (HAA5)	60	2006-06-17	--	--	--	60	2002-01-01	--
Monochloroacetic Acid	--	--	2	53	2022	--	--	70
Dichloroacetic Acid	--	--	1	0.2	2022	--	--	zero
Trichloroacetic Acid	--	--	1	0.1	2022	--	--	20
Monobromoacetic Acid	--	--	1	25	2022	--	--	--
Dibromoacetic Acid	--	--	1	0.03	2022	--	--	--
Bromate	10	2006-06-17	5 ⁴	0.1	2009	10	2002-01-01	zero
Chlorite	1000	2006-06-17	20	50	2009	1000	2002-01-01	800

Radionuclides

The information in the following table can be found in [22 CCR §64442](#) (California MCLs and DLRs), [22 CCR §64443](#) (California MCLs and DLRs), [OEHHA's website](#) (California PHGs), [40 CFR §141.66](#) (U.S. EPA MCLs), and [40 CFR §141.55](#) (U.S. EPA MCLGs). The values in this table are in **units of picocuries per liter (pCi/L)** unless otherwise stated.

⁴ The DLR for bromate is 0.0010 mg/L for analysis performed using EPA Methods 317.0 Revision 2.0, 321.8, or 326.0.

Radionuclides	California					U.S. EPA		
	MCL	MCL Effective Date	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
Gross alpha particle activity ⁵	15 ⁶ 15	2006-06-11 1977	3	none ⁷	--	15	1977-06-24	zero
Beta/photon emitters ⁸	4 mrem/yr 50	2006-06-11 1977	4	none ⁷	--	4 mrem/yr	1977-06-24	zero
Radium-226	--	--	1	0.05	2006	--	--	--
Radium-228	--	--	1	0.019	2006	--	--	--
Radium-226 + Radium-228	5 ⁶ 5	2006-06-11 1977	--	--	--	5	1977-06-24	zero
Strontium-90	8 ⁹ 8	2006-06-11 1977	2	0.35	2006	4 mrem/yr ¹⁰ 8	2003-12-08 1977-06-24	--
Tritium	20,000 ⁹ 20,000	2006-06-11 1977	1,000	400	2006	4 mrem/yr ¹⁰ 20,000	2003-12-08 1977-06-24	--
Uranium	20 ⁶ 20	2006-06-11 1989-01-01	1	0.43	2001	30 µg/L ¹¹	2003-12-08	zero

⁵ Excludes alpha particle activity from radon and uranium.

⁶ Revised MCL applies to both community (CWS) and nontransient noncommunity water systems (NTNCWS); previous MCL applied only to CWS.

⁷ OEHHA concluded in 2003 that it would not be practical to develop a PHG ([for gross alpha particle activity](#), [for gross beta particle/photon emitters](#)).

⁸ Beta/photon emitters MCLs are in units of millirems per year (mrem/yr) annual dose equivalent to the total body or any internal organ. The DLR is in units of pCi/L of gross beta particle activity.

⁹ Revised MCL applies to all CWS and NTNCWS; previous MCL applied only to water systems with at least 30,000 service connections that used surface water.

¹⁰ U.S. EPA does not have specific MCLs for strontium-90 or tritium; both are regulated under the beta/photon emitters MCL.

¹¹ U.S. EPA MCL of 30 µg/L is equivalent to 20.1 pCi/L (unit conversion using natural uranium specific activity of 0.67 pCi/µg).

Copper and Lead

Standards for lead and copper are called “Action Levels” instead of MCLs. If a system exceeds an Action Level, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public education program. The information in the following table can be found in [22 CCR §64678](#) (California Action Levels and DLRs), [OEHHA's website](#) (California PHGs), [40 CFR §141.80](#) (U.S. EPA Action Levels), and [40 CFR §141.51](#) (U.S. EPA MCLGs). The values in this table are in **units of micrograms per liter (µg/L)**.

Contaminants	California					U.S. EPA		
	Action Level	Action Level Effective Date	DLR	PHG	PHG Date	Action Level	Action Level Effective Date	MCLG
Copper	1,300	1995-12-11	50	300	2008	1,300	1991-11-06	1,300
Lead	15 50	1995-12-11 1977	5	0.2	2009	15 50	1991-11-06 1977-06-24	zero

Treatment Techniques

A treatment technique is a required process intended to reduce contaminant levels in drinking water, safeguarding public health. Rather than setting specific limits on contaminant concentrations, the treatment techniques below focus on the processes used to ensure protection from contaminants:

- **Coliform:** If a water system finds coliform bacteria (which indicate the presence of harmful microorganisms), they must assess and fix any issues in actions called Level 1 and Level 2 assessments.
- **Viruses:** Systems must treat groundwater to remove or inactivate at least 99.99% of viruses using methods like disinfection. They must monitor and correct any issues within hours if they fail to meet these standards.
- **Cryptosporidium:** For surface water or groundwater influenced by surface water, system must treat to remove or inactivate a parasite called Cryptosporidium, which involves special filtration and disinfection processes.
- **Disinfection Byproducts:** Systems have several options for treatment techniques to reduce the levels of disinfection byproducts (total trihalomethanes (TTHMs), haloacetic acids (HAA5), bromate, and chlorite).
- **Acrylamide and Epichlorohydrin:** Water systems that use certain chemicals in the treatment process must certify that the chemical levels are kept below safe limits.

Secondary Standards

Secondary Maximum Contaminant Levels (SMCLs) provide water quality standards related to aesthetic aspects of drinking water, such as taste, odor, and appearance. Though not directly linked to health risks, SMCLs play a crucial role in maintaining

consumer confidence and satisfaction. The information in the following two tables can be found in [22 CCR §64449](#) (California SMCLs) and [40 CFR §143.3](#) (U.S. EPA SMCLs). The values in this table are in **units of micrograms per liter (µg/L)** unless otherwise stated.

Chemical	California			U.S. EPA		
	SMCL		SMCL Effective Date	SMCL	SMCL Effective Date	
Aluminum	200		1994-09-08	50 to 200	1992-07-30	
Color	15 Units		1977	15 Units	1981-01-19	
Copper	1,000		1977	1,000 ¹² 1,000	1992-07-30 1981-01-19	
Corrosivity	--		Removed	Non-corrosive	1981-01-19	
Fluoride	See 22 CCR §64433.2		1998-04-22	2,000	1986-05-02	
Foaming Agents (MBAS)	500		1977	500	1981-01-19	
Iron	300		1977	300	1981-01-19	
Manganese	50		1977	50	1981-01-19	
Methyl- <i>tert</i> -butyl ether (MTBE)	5		1999-01-07	--	--	
Odor -Threshold	3 Units		1977	3 Units	1981-01-19	
pH	--		--	6.5 to 8.5	1981-01-19	
Silver	100		--	100	1992-07-30	
Thiobencarb	1		1989-04-05	--	--	
Turbidity	5 Units		1977	--	--	
Zinc	5,000		1977	5,000	1981-01-19	
	Recommended	Upper	Short Term			
Total Dissolved Solids (mg/L) <i>or</i> Specific Conductance (µS/cm ⁹)	500	1,000	1,500	--	500	1981-01-19
	900	1,600	2,200	--	--	--
Chloride (mg/L)	250	500	600	--	250	1981-01-19
Sulfate (mg/L)	250	500	600	--	250	1981-01-19

¹² The updated SMCL for copper increased the number of significant figures from 1 to 2.

Chemicals soon to be regulated in drinking water in California

The information in the following table can be found in [OEHHA’s website](#) (California PHGs), [40 CFR §141.61](#) (U.S. EPA MCLs), and [40 CFR §141.50](#) (U.S. EPA MCLGs). The values in this table are in **units of nanograms per liter (ng/L)** unless otherwise stated.

Chemicals	California				U.S. EPA		
	MCL	DLR	PHG	PHG Date	MCL	MCL Effective Date	MCLG
N-Nitrosodimethylamine (NDMA)	--	--	3	2006	--	--	--
Perfluorooctanoic acid (PFOA)	--	--	0.007	2024	4.0	2029-04-26	zero
Perfluorooctane sulfonic acid (PFOS)	--	--	1	2024	4.0	2029-04-26	zero
Perfluorohexane sulfonic acid (PFHxS)	--	--	--	--	10.0	2029-04-26	10
Perfluorononanoate (PFNA)	--	--	--	--	10.0	2029-04-26	10
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoate (HFPO-DA or GenX Chemicals)	--	--	--	--	10.0	2029-04-26	10
PFAS Hazard Index ¹³ (includes HFPO-DA, PFBS ¹⁴ , PFHxS, and PFNA)	--	--	--	--	1 (unitless)	2029-04-26	1 (unitless)

¹³ PFAS Hazard Index = $([\text{HFPO-DA}_{\text{water}} \text{ ng/L}]/[10 \text{ ng/L}]) + ([\text{PFBS}_{\text{water}} \text{ ng/L}]/[2000 \text{ ng/L}]) + ([\text{PFNA}_{\text{water}} \text{ ng/L}]/[10 \text{ ng/L}]) + ([\text{PFHxS}_{\text{water}} \text{ ng/L}]/[10 \text{ ng/L}])$

¹⁴ Perfluorobutane sulfonate (PFBS)