

WHS HEALTH GUIDELINES



RIGOROUS STANDARDS ENSURING FULL PUBLIC HEALTH PROTECTION

The health guidelines presented in the WHS Tap Water Database reflect the highest allowable concentration of a contaminant in water, as determined by scientific consensus for ensuring safety. These values are solely focused on safeguarding health and do not factor in the technical feasibility or the associated water treatment costs. The data within this table comprises health guidelines disseminated by either federal or state health and environmental agencies, or alternatively, established by WHS Water researchers through comprehensive, up-to-date scientific investigations.

Units used in the table: parts per million (ppm); parts per billion (ppb); picocuries per liter (pCi/L)

Updated October 2023

CONTAMINANT (IN ALPHABETICAL ORDER)	FEDERAL LEGAL LIMIT	WHS WATER STANDARD	SOURCE OF STANDARD	HEALTH EFFECTS
1,1-Dichloroethane	Nonexistent	3 ppb	California public health goal	Cancer; change to the heart and blood vessels
1,1,2-Trichloroethane	5 ppb	0.3 ppb	California public health goal	Liver cancer; harm to the kidney; change to the central nervous system
1,2-Dibromo-3-chloropropane	0.2 ppb	0.0017 ppb	California public health goal	Testicular cancer; harm to the male reproductive system; infertility
1,2-Dichloroethane	5 ppb	0.4 ppb	California public health goal	Cancer; harm to the immune system; harm to the stomach and intestines; harm to the liver; harm to the kidney; harm to the brain and nervous system
1,2-Dichloropropane	5 ppb	0.5 ppb	California public health goal	Liver cancer; harm to the liver; harm to the kidney; change to blood cells
1,2,3-Trichloropropane	Nonexistent	0.0007 ppb	California public health goal	Cancer
1,2,4-Trichlorobenzene	70 ppb	5 ppb	California public health goal	Harm to the adrenal gland; cancer
1,3-Butadiene	Nonexistent	0.0103 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the Environmental Protection Agency	Cancer; harm to the brain and nervous system; harm to reproduction and child development; change to blood cells; change to the kidney

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1,4-Dioxane	Nonexistent	0.35 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the Environmental Protection Agency	Cancer; irritation of the lungs; harm to the kidney
p-Dichlorobenzene	75 ppb	6 ppb	California public health goal	Cancer; harm to the liver; harm to the kidney; harm to the thyroid
2,4-D (2,4-dichlorophenoxyacetic acid)	70 ppb	20 ppb	California public health goal	Hormone disruption; harm to the liver; harm to the kidney; harm to the thyroid; harm to the brain and nervous system; change to immune system function
Aluminum	Nonexistent	600 ppb	California public health goal	Harm to the brain and nervous system
Antimony	6 ppb	1 ppb	California public health goal	Harm to the liver; change to the stomach and intestines
Arsenic	10 ppb	0.004 ppb	California public health goal	Cancer; harm to the central nervous system; harm to the brain and nervous system; skin damage; change to the heart and blood vessels; increase the risk of heart disease, stroke and diabetes
Atrazine	3 ppb	0.1 ppb	WHS-recommended health guideline	Harm to the developing fetus; hormone disruption; harm to the reproductive system; changes in the nervous system; changes in brain and behavior; cancer
Barium	2 ppm	0.7 ppm	Children's health-based limit for 10-day exposure, as defined by the Environmental Protection Agency	Harm to the kidney; high blood pressure; harm to the heart and blood vessels
Benzene	5 ppb	0.15 ppb	California public health goal	Cancer; harm to blood cells; harm to the central nervous system; harm to child development; harm to the immune system

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Benzo[a]pyrene	0.2 ppb	0.007 ppb	California public health goal	Cancer; harm to the immune system; harm to reproduction and child development; change to the central nervous system
Beryllium	4 ppb	1 ppb	California public health goal	Harm to the stomach and intestines; harm to the lungs; harm to bones
Bromate	10 ppb	0.1 ppb	California public health goal	Cancer
Bromochloroacetic acid	Nonexistent	0.02 ppb	WHS-recommended health guideline	Cancer; harm to fetal growth and development.
Bromodichloroacetic acid	Nonexistent	0.04 ppb	WHS-recommended health guideline	Cancer; harm to fetal growth and development.
Bromodichloromethane	Nonexistent	0.4 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the California Office of Environmental Health Hazard Assessment	Cancer; harm to reproduction and child development; change to fetal growth and development
Bromoform	Nonexistent	5 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the California Office of Environmental Health Hazard Assessment	Cancer; harm to reproduction and child development; change to fetal growth and development
Cadmium	5 ppb	0.04 ppb	California public health goal	Cancer; harm to the kidney; change in behavior
Carbofuran	40 ppb	0.7 ppb	California public health goal	Harm to the brain and nervous system; harm to the reproductive system
Carbon tetrachloride	5 ppb	0.1 ppb	California public health goal	Cancer; harm to the liver; harm to the central nervous system; harm to the kidney; decrease in fertility

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Chlorate	Nonexistent	210 ppb	Health benchmark defined by the Environmental Protection Agency for testing under the Unregulated Contaminant Monitoring Rule program	Hormone disruption
Chlordane	2 ppb	0.03 ppb	California public health goal	Cancer; hormone disruption; harm to reproduction and child development
Chlorodibromoacetic acid	Nonexistent	0.02 ppb	WHS-recommended health guideline	Cancer; harm to fetal growth and development
Chlorite	1 ppm	0.050 ppm	California public health goal	Change to blood cells; change to the thyroid; hormone disruption; harm to reproduction and child development
Chloroform	Nonexistent	1 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the California Office of Environmental Health Hazard Assessment	Cancer; harm to fetal growth and development
Chloromethane	Nonexistent	2.69 ppb	Health benchmark defined by the Environmental Protection Agency for testing under the Unregulated Contaminant Monitoring Rule program	Cancer
Chromium (hexavalent)	Nonexistent	0.02 ppb	California public health goal	Cancer; harm to the liver; harm to the reproductive system
Cobalt	Nonexistent	70 ppb	Health benchmark defined by the Environmental Protection Agency for testing under the Unregulated Contaminant Monitoring Rule program	Harm to the heart; change in blood chemistry; harm to the stomach and intestines

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Copper	Nonexistent	300 ppb	California public health goal	Diarrhea; weight loss; vomiting
Cyanide	200 ppb	150 ppb	California public health goal	Harm to the brain and nervous system; harm to the thyroid; harm to the central nervous system
Di(2-ethylhexyl) adipate	400 ppb	200 ppb	California public health goal	Change to fetal growth and development; harm to the liver
Di(2-ethylhexyl) phthalate	6 ppb	3 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the Environmental Protection Agency	Harm to the male reproductive system; harm to the immune system; change to fetal growth and development; hormone disruption
Dibromoacetic acid	Nonexistent	0.04 ppb	WHS-recommended health guideline	Cancer; harm to fetal growth and development
Dibromochloromethane	Nonexistent	0.7 ppb	Contaminant concentration corresponding to a one-in-a-million lifetime risk of cancer, as defined by the California Office of Environmental Health Hazard Assessment	Cancer; harm to fetal growth and development
Dichloroacetic acid	Nonexistent	0.2 ppb	WHS-recommended health guideline	Cancer; harm to reproduction and child development
p-Dichlorobenzene	75 ppb	6 ppb	California public health goal	Cancer; harm to the liver; harm to the kidney; harm to the thyroid
Dichloromethane (methylene chloride)	5 ppb	4 ppb	California public health goal	Cancer; harm to reproduction and child development; harm to the liver
Diquat	20 ppb	6 ppb	California public health goal	Change to fetal growth and development; change in body weight; harm to the kidney; cataracts
Endothall	100 ppb	94 ppb	California public health goal	Change to the stomach and intestines; eye damage; skin irritation

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Endrin	2 ppb	0.3 ppb	California public health goal	Cancer; change to the central nervous system; harm to the immune system; harm to the reproductive system
Ethylbenzene	700 ppb	300 ppb	California public health goal	Cancer; harm to the lungs; harm to the liver; harm to the kidney; change to the central nervous system
Ethylene dibromide	0.05 ppb	0.01 ppb	California public health goal	Cancer; harm to the reproductive system; harm to the central nervous system; change to fetal growth and development
Glyphosate	700 ppb	5 ppb	EWG-recommended health guideline	Cancer; harm to fetal growth; harm to the kidney
Haloacetic acids (HAA5)	60 ppb	0.1 ppb	WHS-recommended health guideline	Cancer; harm to fetal growth and development
Heptachlor	0.4 ppb	0.008 ppb	California public health goal	Cancer; hormone disruption; harm to the brain and nervous system
Heptachlor epoxide	0.2 ppb	0.006 ppb	California public health goal	Cancer; hormone disruption; harm to the liver
Hexachlorobenzene	1 ppb	0.03 ppb	California public health goal	Cancer; harm to the brain and nervous system; hormone disruption
Hexachlorocyclopentadiene	50 ppb	2 ppb	California public health goal	Harm to the stomach and intestines; change to the liver; change to the kidney; irritation of the lungs
Lead	15 ppb (federal action level for lead in drinking water)	0.2 ppb	California public health goal	Harm to the brain and nervous system
Lindane	0.2 ppb	0.032 ppb	California public health goal	Cancer; harm to the brain and nervous system; harm to the immune system
Manganese	Nonexistent	100 ppb	A risk assessment advisory level defined by the Minnesota Department of Health	Harm to the brain and nervous system; change in behavior

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Mercury (inorganic)	2 ppb	1.2 ppb	California public health goal	Harm to the brain and nervous system; harm to fetal growth and child development; harm to the kidney; harm to the immune system
Methoxychlor	40 ppb	0.09 ppb	California public health goal	Hormone disruption; harm to the reproductive system; harm to the kidney; harm to the liver; harm to the immune system; harm to the brain and nervous system
Molybdenum	Nonexistent	40 ppb	The Environmental Protection Agency health advisory for lifetime exposure	Change in blood chemistry; gout
Monobromoacetic acid	Nonexistent	25 ppb	WHS-recommended health guideline	Change to fetal growth and development
Monochloroacetic acid	Nonexistent	53 ppb	WHS-recommended health guideline	Change to fetal growth and development
Monochlorobenzene (chlorobenzene)	100 ppb	70 ppb	California public health goal	Harm to the liver; harm to the kidney
MTBE	Nonexistent	13 ppb	California public health goal	Cancer
N-Nitrosodimethylamine (NDMA)	Nonexistent	0.003 ppb	California public health goal	Cancer
Nitrate (measured as Nitrogen)	10 ppm	0.14 ppm	WHS-recommended health guideline	Cancer; harm to fetal growth and child development
Oxamyl	200 ppb	26 ppb	California public health goal	Harm to the central nervous system; harm to the brain and nervous system; harm to child development
Pentachlorophenol	1 ppb	0.3 ppb	California public health goal	Cancer; harm to child development; harm to the immune system; hormone disruption
Perchlorate	Nonexistent	1 ppb	California public health goal	Hormone disruption; harm to fetal growth and child development
Perfluorobutane sulfonate (PFBS)	Nonexistent	0.001 ppb	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver

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Perfluoroheptanoic acid (PFHPA)	Nonexistent	0.001 ppb	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver
Perfluorohexane sulfonate (PFHXS)	Nonexistent	0.001 ppb	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver
Perfluorononanoic acid (PFNA)	Nonexistent	0.001 ppb	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver
Perfluorooctane sulfonate (PFOS)	Nonexistent	0.001 ppb	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver
Perfluorooctanoic acid (PFOA)	Nonexistent	0.007 ppt	WHS-recommended health guideline	Cancer; harm to the immune system; hormone disruption; harm to fetal growth and child development; harm to the liver
Picloram	500 ppb	166 ppb	California public health goal	Harm to the liver; harm to the kidney; change to the reproductive system
Polychlorinated biphenyls (PCBs)	0.5 ppb	0.09 ppb	California public health goal	Breast cancer; prostate cancer; harm to the brain and nervous system; hormone disruption; harm to the immune system
Radium-226	5 pCi/L for combined radium-226 and radium-228	0.05 pCi/L	California public health goal	Cancer
Radium-228	5 pCi/L for combined radium-226 and radium-228	0.019 pCi/L	California public health goal	Cancer

CONTAMINANT (IN ALPHABETICAL ORDER)	FEDERAL LEGAL LIMIT	WHS WATER STANDARD	SOURCE OF STANDARD	HEALTH EFFECTS
Selenium	50 ppb	30 ppb	California public health goal	Hormone disruption; harm to child development; harm to the brain and nervous system; skin damage
Simazine	4 ppb	0.1 ppb	WHS-recommended health guideline	Harm to the developing fetus; hormone disruption; harm to the reproductive system; changes in the nervous system; changes in brain and behavior; cancer
Strontium	Nonexistent	1.5 ppm	Health benchmark defined by the Environmental Protection Agency for testing under the Unregulated Contaminant Monitoring Rule program	Harm to bones
Strontium-90	Nonexistent	0.35 pCi/L	California public health goal	Cancer; harm to bones
Styrene	100 ppb	0.5 ppb	California public health goal	Cancer; harm to the liver; harm to the brain and nervous system
Tetrachloroethylene (perchloroethylene)	5 ppb	0.06 ppb	California public health goal	Lung cancer; breast cancer; colon cancer; harm to the kidney; harm to the liver; harm to the central nervous system
Thallium	2 ppb	0.1 ppb	California public health goal	Hair loss; harm to the liver; harm to the central nervous system; harm to the brain and nervous system; harm to the male reproductive system
Toluene	1 ppm	0.15 ppm	California public health goal	Harm to the brain and nervous system; harm to the liver; harm to the immune system; harm to the reproductive system; harm to fetal growth and development
Total trihalomethanes (TTHMs)	80 ppb	0.15 ppb	WHS-recommended health guideline	Bladder cancer; skin cancer; harm to fetal growth and development

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Toxaphene	3 ppb	0.03 ppb	California public health goal	Cancer; harm to the brain and nervous system; harm to the liver; harm to the kidney; hormone disruption
Tribromoacetic acid	Nonexistent	0.04 ppb	WHS-recommended health guideline	Change to fetal growth and development
Trichloroacetic acid	Nonexistent	0.1 ppb	WHS-recommended health guideline	Cancer; harm to reproduction and child development
Trichloroethylene	5 ppb	0.4 ppb	A risk assessment advisory level defined by the Minnesota Department of Health	Cancer; change to fetal growth and development; harm to the liver; harm to the kidney
Trichlorofluoromethane	Nonexistent	1.3 ppm	California public health goal	Harm to the liver; change to the central nervous system; harm to the heart and blood vessels
Trichlorotrifluoroethane	Nonexistent	4 ppm	California public health goal	Harm to the liver; change to the central nervous system; harm to the heart and blood vessels
Tritium	Nonexistent	400 pCi/L	California public health goal	Cancer
Uranium	30 ppb*	0.43 pCi/L	California public health goal	Cancer; harm to the kidney
Vanadium	Nonexistent	21 ppb	Health benchmark defined by the Environmental Protection Agency for testing under the Unregulated Contaminant Monitoring Rule program	Change in blood chemistry; harm to reproduction and child development
Vinyl chloride	2 ppb	0.05 ppb	California public health goal	Liver cancer; harm to the liver; change to the central nervous system
Xylenes (total)	10 ppm	1.8 ppm	California public health goal	Harm to the brain and nervous system; change to the central nervous system; change to fetal growth and development

* The legal limit for uranium is 30 micrograms per liter (corresponding to parts per billion or ppb), but the human health guideline for uranium is based on the overall radioactivity of the substance. Using an EPA conversion factor described in the 2002 EPA Implementation Guidance for Radionuclides, uranium test results can be converted from parts per billion to picocuries per liter. A measurement of 30 ppb is calculated to have a radioactivity level of 20 pCi/L.