

2019 Water Quality Report to SDCWA member agencies -- San Diego County Water Authority

Parameter	Units	State or Federal MCL [MRDL]	PHG (MCLG) [MRDLG]	State DLR	Range Average	Treatment Plant Effluent	Major Sources in Drinking Water
						Twin Oaks Valley Water Treatment Plant	
PRIMARY STANDARDS--Mandatory Health-Related Standards							
CLARITY							
Combined Filter Effluent Turbidity	NTU	0.1	NA	NA	Range	0.01 - 0.02	Soil runoff
	NTU	0.1	NA	NA	Average	0.015	
	%	95 (a)	NA	NA	%≤ 0.1	100.0%	
MICROBIOLOGICAL							
Total Coliform					Range	ND	Naturally present in the environment
Bacteria in Distribution System	%	5.0 (b)	0	NA	Average	ND	
Total Coliform					Range	ND	
Bacteria in Treatment Plant effluent	%	5.0 (b)	0	NA	Average	ND	Naturally present in the environment
E. coli					Range	ND	Human and animal fecal waste
Bacteria in Treatment Plant effluent	(c)	(c)	0	NA	Average	ND	
ORGANIC CHEMICALS							
Pesticides/PCBs							
Alachlor	ppb	2	4	1	Range	ND	Runoff from herbicide used on row crops
					Average	ND	
					Range	ND	
Atrazine	ppb	1	0.15	0.5	Average	ND	Runoff from herbicide used on row crops and along highways
					Range	ND	Runoff/leaching from herbicide used on rice, alfalfa, and grapes
Bentazon	ppb	18	200	2	Average	ND	
					Range	ND	
Carbofuran	ppb	18	0.7	5	Average	ND	Leaching of soil fumigant used on rice, alfalfa, and grapes
					Range	ND	Residue of banned insecticide
Chlordane	ppt	100	30	100	Average	ND	
					Range	ND	
2,4-D	ppb	70	20	10	Average	ND	Runoff from herbicide used on row crops, range land, lawns and aquatic weeds
					Range	ND	Runoff from herbicide used on rights-of-way, crops, and landscapes
Dalapon	ppb	200	790	10	Average	ND	
					Range	ND	
Dibromochloropropane (DBCP)	ppt	200	1.7	10	Average	ND	Banned nematocide that may still be present in soils
					Range	ND	Runoff from herbicide used on soybeans, vegetables, and fruits
Dinoseb	ppb	7	14	2	Average	ND	
					Range	ND	
Diquat	ppb	20	6	4	Average	ND	Runoff from herbicide used for terrestrial and aquatic weeds
					Range	ND	Runoff from herbicide used for terrestrial and aquatic weeds
Endothall	ppb	100	94	45	Average	ND	
					Range	ND	
Endrin	ppb	2	0.3	0.1	Average	ND	Residue of banned insecticide and rodenticide
					Range	ND	Petroleum refinery discharges; underground gas tank leaks
Ethylene Dibromide (EDB)	ppt	50	10	20	Average	ND	
					Range	ND	
Glyphosate	ppb	700	900	25	Average	ND	Runoff from herbicide use
					Range	ND	Residue of banned insecticide
Heptachlor	ppt	10	8	10	Average	ND	
					Range	ND	
Heptachlor Epoxide	ppt	10	6	10	Average	ND	Breakdown product of heptachlor
					Range	ND	Runoff/leaching from insecticide used on cattle, lumber, and gardens
Lindane	ppt	200	32	200	Average	ND	
					Range	ND	
Methoxychlor	ppb	30	0.09	10	Average	ND	Runoff/leaching from insecticide uses
					Range	ND	Runoff/leaching from herbicide used on rice
Molinate (Ordram)	ppb	20	1	2	Average	ND	
					Range	ND	
Oxamyl (Vydate)	ppb	50	26	20	Average	ND	Runoff/leaching from insecticide uses
					Range	ND	Discharge from wood preserving factories other insecticidal and herbicidal uses
Pentachlorophenol	ppb	1	0.3	0.2	Average	ND	
					Range	ND	
Picloram	ppb	500	166	1	Average	ND	Herbicide runoff
					Range	ND	Runoff from landfills; discharge of waste chemicals
Polychlorinated Biphenyls (PCBs)	ppt	500	90	500	Average	ND	
					Range	ND	
Simazine	ppb	4	4	1	Average	ND	Herbicide runoff
					Range	ND	Runoff leaching from rice herbicide
Thiobencarb (d)	ppb	70	42	1	Average	ND	
					Range	ND	
2,4,5-TP (Silvex)	ppb	50	3	1	Average	ND	Residue of banned herbicide
					Range	ND	Runoff/leaching from insecticide used on cotton and cattle
Toxaphene	ppb	3	0.03	1	Average	ND	
					Range	ND	
Semi-Volatile Organic Compounds							
Acrylamide	NA	TT	(0)	NA	Range	ND	Water treatment chemical impurities
					Average	ND	
					Range	ND	
Benzo(a)pyrene	ppt	200	7	100	Average	ND	Leaching from water storage tank linings and distribution lines
					Range	ND	Discharge from chemical factories
Di(2-ethylhexyl)adipate	ppb	400	200	5	Average	ND	
					Range	ND	
Di(2-ethylhexyl)phthalate	ppb	4	12	3	Average	ND	Chemical factory discharge; inert ingredient in pesticides
					Range	ND	Water treatment chemical impurities
Epichlorohydrin	NA	TT	(0)	NA	Average	ND	
					Range	ND	
Hexachlorobenzene	ppb	1	0.03	0.5	Average	ND	Discharge from metal refineries & agrichemicals factories; wastewater chlorination reaction by-product
					Range	ND	Discharge from chemical factories
Hexachlorocyclopentadiene	ppb	50	2	1	Average	ND	
					Range	ND	
2,3,7,8-TCDD (Dioxin)	ppg	30	0.05	5	Average	ND	Waste incineration emissions; chemical factory discharge
Volatile Organic Compounds							
Benzene	ppb	1	0.15	0.5	Range	ND	Plastics factory discharge; gas tanks and landfill leaching
					Average	ND	
					Range	ND	
Carbon Tetrachloride	ppt	500	100	500	Average	ND	Discharge from chemical plants and other industrial waste
					Range	ND	Discharge from industrial chemical factories
1,2-Dichlorobenzene	ppb	600	600	0.5	Average	ND	
					Range	ND	
1,4-Dichlorobenzene	ppb	5	6	0.5	Average	ND	Discharge from industrial chemical factories
					Range	ND	Extraction and degreasing solvent; fumigant
1,1-Dichloroethane	ppb	5	3	0.5	Average	ND	
					Range	ND	
1,2-Dichloroethane	ppt	500	400	500	Average	ND	Discharge from industrial chemical factories
					Range	ND	Discharge from industrial chemical factories
1,1-Dichloroethylene	ppb	6	10	0.5	Average	ND	
					Range	ND	
cis -1,2-Dichloroethylene	ppb	6	13	0.5	Average	ND	Industrial chemical factory discharge; by-product of TCE and PCE biodegradation
					Range	ND	Industrial chemical factory discharge; by-product of TCE and PCE biodegradation
trans -1,2-Dichloroethylene	ppb	10	50	0.5	Average	ND	
					Range	ND	
Dichloromethane (Methylene Chloride)	ppb	5	4	0.5	Average	ND	Discharge from pharmaceutical and chemical factories
					Range	ND	Industrial chemical factory discharge; primary component of some fumigants
1,2-Dichloropropane	ppb	5	0.5	0.5	Average	ND	
					Range	ND	

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1,3-Dichloropropene	ppt	500	200	500	Range	ND	Runoff/leaching from nematocide used on croplands
					Average	ND	
Ethylbenzene	ppb	300	300	0.5	Range	ND	Petroleum refinery discharge; industrial chemical factories
					Average	ND	
Methyl tert-butyl ether (MTBE) (d,e)	ppb	13	13	3	Range	ND	Gasoline discharge from watercraft engines
					Average	ND	
Monochlorobenzene	ppb	70	70	0.5	Range	ND	Discharge from industrial, agricultural, and chemical factories, and dry cleaners
					Average	ND	
Styrene	ppb	100	0.5	0.5	Range	ND	Rubber and plastics factories discharge; landfill leaching
					Average	ND	
1,1,2,2-Tetrachloroethane	ppb	1	0.1	0.5	Range	ND	Discharge from industrial, agricultural, and chemical factories; solvent uses
					Average	ND	
Tetrachloroethylene (PCE)	ppb	5	0.06	0.5	Range	ND	Discharge from factories, dry cleaners, and auto shops
					Average	ND	
Toluene	ppb	150	150	0.5	Range	ND	Discharge from petroleum and chemical refineries
					Average	ND	
1,2,4-Trichlorobenzene	ppb	5	5	0.5	Range	ND	Discharge from textile-finishing factories
					Average	ND	
1,1,1-Trichloroethane	ppb	200	1000	0.5	Range	ND	Metal degreasing site discharge; manufacture of food wrappings
					Average	ND	
1,1,2-Trichloroethane	ppb	5	0.3	0.5	Range	ND	Discharge from industrial chemical factories
					Average	ND	
1,2,3-Trichloropropane	ppt	5	0.7	5	Range	ND	Cleaning and degreasing solvent, also associated with pesticide products
					Average	ND	
Trichloroethylene (TCE)	ppb	5	1.7	0.5	Range	ND	Discharge from metal degreasing sites and other factories
					Average	ND	
Trichlorofluoromethane (Freon-11)	ppb	150	1300	5	Range	ND	Industrial factory discharge; degreasing solvent; propellant
					Average	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	ppm	1.2	4	0.01	Range	ND	Discharge from metal degreasing sites and other factories; dry cleaning solvent; refrigerant
					Average	ND	
Vinyl Chloride	ppt	500	50	500	Range	ND	Leaching from PVC piping; plastic factory discharge; by-product of TCE and PCE biodegradation
					Average	ND	
Xylenes	ppm	1.750	1.8	0.0005	Range	ND	Discharge from petroleum and chemical refineries; fuel solvent
					Average	ND	

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INORGANIC CHEMICALS							
Aluminum (d)	ppm	1	0.6	0.05	Range Average	ND ND	Natural deposits erosion; Residue from water treatment process.
Antimony	ppb	6	1	6	Single Sample	ND	Petroleum refinery discharges; fire retardants; solder; electronics
Arsenic	ppb	10	0.004	2	Single Sample	3	Natural deposits erosion, glass and electronics production wastes
Asbestos	MFL	7	7	0.2	Single Sample	ND	Asbestos cement pipes internal corrosion; natural deposits erosion
Barium	ppb	1000	2000	100	Single Sample	50	Natural deposits erosion; Oil and metal refineries discharge.
Beryllium	ppb	4	1	1	Single Sample	ND	Discharge from metal refineries, aerospace, and defense industries
Cadmium	ppb	5	0.04	1	Single Sample	ND	Internal corrosion of galvanized pipes; natural deposits erosion
Chromium	ppb	50	(100)	10	Single Sample	ND	Discharge from steel and pulp mills; natural deposits erosion
Chromium VI (g)	ppb	NA	0.02	NA	Range Average	0.06-0.49 0.27	Runoff/leaching from natural deposits; discharge from industrial waste factories
Copper (d,f)	ppm	1.0	0.3	0.05	Single Sample	0.0024	Internal corrosion of household pipes; natural deposits erosion
Cyanide	ppb	150	150	100	Single Sample	ND	Discharge from steel/metal, plastic, and fertilizer factories
					Control Range Optimal Fluoride Level	0.6 - 1.2 0.7 0.5-0.7	Erosion of natural deposits; water additive that promotes strong teeth
Fluoride (g) Treatment-related	ppm	2.0	1	0.1	Range Average	0.7 0.7	
Lead (g)	ppb	AL=15	0.2	5	Single Sample	ND	House pipes internal corrosion; erosion of natural deposits
Mercury	ppb	2	1.2	1	Single Sample	ND	Erosion of natural deposits; factory discharge; landfill runoff
Nickel	ppb	100	12	10	Single Sample	ND	Erosion of natural deposits; discharge from metal factories
Nitrate (as N) (h)	ppm	10	10	0.4	Range Average	0.2- 0.4 0.3	Runoff and leaching from fertilizer use; septic tank and sewage; natural deposits erosion
Nitrite (as N)	ppm	1	1	0.4	Range Average	ND ND	Runoff and leaching from fertilizer use; septic tank and sewage; natural deposits erosion
Perchlorate (i)	ppb	6	1	4	Single Sample	ND	Industrial waste discharge
Selenium	ppb	50	30	5	Single Sample	ND	Refineries, mines, and chemical waste discharge; runoff from livestock lots
Thallium	ppb	2	0.1	1	Single Sample	ND	Leaching from ore processing; electronics factory discharge
RADIOLOGICALS (j)							
Gross Alpha Particle Activity	pCi/L	15	(0)	3	Range Average	ND ND	Erosion of natural deposits
Gross Beta Particle Activity (k)	pCi/L	50	(0)	4	Range Average	ND - 3.5 2.3	Decay of natural and man-made deposits
Radium-226	pCi/L	NA	0.05	1	Range Average	ND ND	Erosion of natural deposits
Radium-228	pCi/L	NA	0.019	1	Range Average	ND ND	Erosion of natural deposits
Combined Radium-226 + 228 (l)	pCi/L	5	(0)	NA	Range Average	ND ND	Erosion of natural deposits
Strontium-90	pCi/L	8	0.35	2	Range Average	ND ND	Decay of natural and man-made deposits
Tritium	pCi/L	20000	400	1000	Range Average	ND ND	Decay of natural and man-made deposits
Uranium	pCi/L	20	0.43	1	Single Sample	1.0 -1.1 1.1	Erosion of natural deposits
DISINFECTION BY-PRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS (m)							
Total Trihalomethanes (TTHM) (n)	ppb	80	NA	1	Range Highest TTHM	24-74 74	By-product of drinking water chlorination
Haloacetic Acids (five) (HAA5) (o)	ppb	60	NA	1	Range Highest HAA5	2.2-24 24	By-product of drinking water chlorination
Bromate (p)	ppb	10	0.1	1	Range Average	2 - 4.8 3.1	By-product of drinking water ozonation
Total Chlorine Residual	ppm	[4.0]	[4.0]	NA	Range Average	1.6-3.6 3.1	Drinking watrer disinfectant added for treatment
as Total Organic Carbon (TOC)	ppm	TT	NA	0.30	Range Average	1.9-2.5 2.2	Various natural and man-made sources; TOC is a precursor for the formation of disinfection byproducts
SECONDARY STANDARDS--Aesthetic Standards							
Aluminum (d)	ppb	200	NA	50	Range Average	ND ND	Residue from water treatment process; natural deposits erosion
Chloride	ppm	500	NA	NA	Single Sample	75	Runoff/leaching from natural deposits; seawater influence
Color	Color Units	15	NA	NA	Range Average	ND ND	Naturally occurring organic materials
Copper (d,f)	ppm	1.0	NA	0.05	Single Sample	0.0024	Internal corrosion of household pipes; natural deposits erosion; wood preservatives leaching
Foaming Agents (MBAS)	ppb	500	NA	NA	Single Sample	ND	Municipal and industrial waste discharges
Iron	ppb	300	NA	100	Range Average	ND ND	Leaching from natural deposits; industrial wastes
Manganese	ppb	50	NL = 500	20	Range Average	ND ND	Leaching from natural deposits
MTBE (d,e)	ppb	5	NA	3	Range Average	ND ND	Gasoline discharge from watercraft engines
Odor Threshold	TON	3	NA	1	Single Sample	1.0	Naturally-occurring organic materials
Silver	ppb	100	NA	10	Single Sample	ND	Industrial discharges
Specific Conductance	µS/cm	1600	NA	NA	Single Sample	600	Substances that form ions in water; seawater influence
Sulfate	ppm	500	NA	0.5	Single Sample	89	Runoff/leaching from natural deposits; industrial wastes
Thiobencarb (d)	ppb	1	NA	1	Range Average	ND ND	Runoff/leaching from rice herbicide
Total Dissolved Solids (TDS)	ppm	1000	NA	NA	Single Sample	340	Runoff/leaching from natural deposits; seawater influence
Turbidity (a)	NTU	5	NA	0.1	Range Average	ND ND	Soil runoff
Zinc	ppm	5.0	NA	0.05	Single Sample	ND	Runoff/leaching from natural deposits; industrial wastes
OTHER PARAMETERS							
CHEMICAL							
Acetochlor	ppb	NA	NA	2	Range Average	ND ND	Herbicide runoff

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Alachlor	ppb	NA	NA	2	Range Average	ND ND	Herbicide runoff
Alkalinity (t)	ppm	NA	NA	NA	Single Sample	86	
Boron	ppb	NL = 1000	NA	100	Single Sample	120	Runoff/leaching from natural deposits; industrial wastes
Calcium	ppm	NA	NA	NA	Single Sample	34	
Chlorate	ppb	NL = 800	NA	20	Range Average	190-450 251	By-product of drinking water chlorination; industrial processes
Corrosivity (r) (as Aggressiveness Index)	AI	NA	NA	NA	Single Sample	12	Elemental balance in water; affected by temperature, other factors
Corrosivity (s) (as Saturation Index)	SI	NA	NA	NA	Single Sample	.11	Elemental balance in water; affected by temperature, other factors
Dimethoate	ppb	NA	NA	0.7	Range Average	ND ND	Runoff from insecticide used on crops and residential uses
Hardness (t)	ppm	NA	NA	NA	Single Sample	140	
Magnesium	ppm	NA	NA	NA	Single Sample	14	
Metolachlor	ppb	NA	NA	1	Range Average	ND ND	Herbicide runoff
pH	pH Units	NA	NA	NA	Range Average	7.6-8.5 8.2	
Potassium	ppm	NA	NA	NA	Single Sample	3.2	
Radon (i)	pCi/L	NA	NA	100	Single Sample	ND	
Sodium	ppm	NA	NA	NA	Single Sample	64	
TOC	ppm	TT	NA	0.30	Range Average	1.9-2.5 2.2	Various natural and man-made sources
Vanadium	ppb	NL = 50	NA	3	Single Sample	ND	Naturally-occurring; industrial waste discharge
N-Nitrosodiethylamine (NDEA)	ppb	NA	NA	0.005	Single Sample	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosodimethylamine (NDMA)	ppt	NL = 10	3	2	Single Sample	2.3	By-product of drinking water chloramination; industrial processes
N-Nitroso-di-n-butylamine (NDBA)	ppb	NA	NA	0.004	Single Sample	ND	By-product of drinking water chloramination; industrial processes
N-Nitroso-di-n-propylamine (NDPA)	ppb	NA	NA	0.007	Single Sample	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosomethylethylamine (NMEA)	ppb	NA	NA	0.003	Single Sample	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosopyrrolidine (NPYR)	ppb	NA	NA	0.002	Single Sample	ND	By-product of drinking water chloramination; industrial processes
Dichlorodifluoromethane (Freon 12)	ppb	NL = 1000	NA	0.5	Range Average	ND ND	Industrial waste discharge
Ethyl- <i>tert</i> -butylether (ETBE)	ppb	NA	NA	3	Range Average	ND ND	Used as gasoline additive
<i>tert</i> -Amyl-methylether (TAME)	ppb	NA	NA	3	Range Average	ND ND	Used as gasoline additive
<i>tert</i> -Butyl alcohol (TBA)	ppb	NL = 12	NA	2	Single Sample	ND	MTBE breakdown product; used as gasoline additive

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ABBREVIATIONS AND FOOTNOTES

Abbreviations							
AI	Aggressiveness Index					N	Nitrogen
AL	Action Level					NA	Not Applicable
CFE	Combined Filter Effluent					NL	Notification Level
CFU	Colony-Forming Units					ND	None Detect
LRAA	Locational Running Annual Average; highest LRAA is the highest of all Locational Running Annual Averages calculated as average of all samples collected within a 12-month period					NTU	Nephelometric Turbidity Units
						pCi/L	picoCuries per Liter
						PHG	Public Health Goal
						ppb	parts per billion or micrograms per liter (µg/L)
DBP	Disinfection By-Products					ppm	parts per million or milligrams per liter (mg/L)
DLR	Detection Limits for purposes of Reporting					ppq	parts per quadrillion or picograms per liter (pg/L)
HPC	Heterotrophic Plate Count					ppt	parts per trillion or nanograms per liter (ng/L)
MBAS	Methylene Blue Active Substances					SI	Saturation Index (Langelier)
MCL	Maximum Contaminant Level					RAA	Running Annual Average
MCLG	Maximum Contaminant Level Goal					TOC	Total Organic Carbon
MFL	Million Fibers per Liter					TON	Threshold Odor Number
MRDL	Maximum Residual Disinfectant Level					TT	Treatment Technique
MRDLG	Maximum Residual Disinfectant Level Goal					µS/cm	microSiemen per centimeter; or micromho per centimeter (µmho/cm)
Footnotes							
(a)	The turbidity level from the CFE of the membranes shall be less than or equal to 0.1 NTU in 95% of the measurements taken each month and shall not exceed 1.0 NTU at any time. Turbidity is a measure of the cloudiness of the water and is an indicator of treatment performance.					(m)	TOVWTP met all provisions of the Stage 2 Disinfectants/Disinfection By-Products (D/DBP) Rule. Compliance was based on the LRAA. Average and range for the treatment plant effluent were taken from daily and monthly samples for TTHM and HAA5.
(b)	Total coliform MCLs: No more than 5.0% of the monthly samples may be total coliform-positive. In 2019, 287 samples were analyzed and all samples were negative for total coliforms. The MCL was not violated.					(n)	DLR = 0.5 ppb for each TTHM (bromoform, chloroform, dibromochloromethane, bromodichloromethane).
(c)	<i>E.coli</i> MCLs: The occurrence of two (2) consecutive total coliform-positive samples, one of which contains <i>E. coli</i> , constitutes an acute MCL violation. The MCL was not violated.					(o)	DLR = 1.0 ppb for each HAA5 analyte (dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid) except for monochloroacetic acid which has a DLR = 2.0 ppb.
(d)	Aluminum, copper, MTBE, and thiobencarb have both primary and secondary standards.					(p)	Running annual average was calculated from quarterly results of monthly and daily samples. Bromate reporting level is 3 ppb.
(e)	MTBE reporting level is 0.5 ppb.					(q)	Chromium VI reporting level is 0.03 ppb.
(f)	Lead and copper are regulated as a Treatment Technique under the Lead and Copper Rule. It requires systems to take water samples at the consumers' tap. The action levels, which trigger water systems into taking treatment steps if exceeded in more than 10% of the tap water samples, are 1.3 ppm for copper and 15 ppb for lead.					(r)	AI is a calculated value that measures the aggressiveness of water transported through pipes. Water with AI <10.0 is highly aggressive and would be very corrosive to almost all materials found in a typical water system. AI > 12.0 indicates non-aggressive water. AI between 10.0 and 11.9 indicates moderately aggressive water.
(g)	TOVWTP was in compliance with all provisions of the State's Fluoridation System Requirements.					(s)	SI measures the tendency for a water to precipitate or dissolve calcium carbonate (a natural mineral in water). Positive indices indicate the tendency to precipitate and/or deposit scale on pipes and are assumed to be non-corrosive. Negative indices indicate the tendency to dissolve calcium carbonate and are assumed to be corrosive.
(h)	State MCL is 45 mg/L as nitrate, which equals 10 mg/L as N.						
(i)	TOVWTP's perchlorate reporting level is 2 ppb, which is below the state DLR of 4 ppb.						
(j)	Data collected (annually) from four consecutive quarters of monitoring in 2013. TOVWTP's required triennial monitoring (2016-2019) was performed in 2016					(t)	Alkalinity and hardness was based on CaCO ₃
(k)	The gross beta particle activity MCL is 4 millirem/year annual dose equivalent to the total body or any internal organ. The screening level is 50 pCi/L.						
(l)	State MCL is 5 pCi/L for combined Radium-226 and -228.						