

2022 Water Quality Report to SDCWA member agencies -- San Diego County Water Authority

Parameter	Units	State of Federal MCL (MCLG)	PHG (MCLG)	State of P.R.	Range Average	Treatment Plant Effluent		Major Sources in Drinking Water
						Twin Oaks Valley Water Treatment Plant		
<b>PRIMARY STANDARDS--Mandatory Health-Related Standards</b>								
<b>CLARITY</b>								
Combined Filter Effluent Turbidity	NTU	0.1	NA	NA	Range Average	0.005-0.028 0.017		Soil runoff
<b>MICROBIOLOGICAL</b>								
Total Coliform	%	5.0 (b)	0	NA	Range	ND		Naturally present in the environment
Bacteria in Distribution System	%	5.0 (b)	0	NA	Range	ND		Naturally present in the environment
Total Coliform	%	5.0 (b)	0	NA	Range	ND		Naturally present in the environment
Bacteria in Treatment Plant Effluent	%	5.0 (b)	0	NA	Range	ND		Naturally present in the environment
E. coli	col	col	0	NA	Range	ND		Human and animal fecal waste
Bacteria in Treatment Plant Effluent	col	col	0	NA	Range	ND		Human and animal fecal waste
<b>ORGANIC CHEMICALS</b>								
<b>Pesticides/PCBs</b>								
Azinphos	ppb	2	4	1	Range Average	ND ND		Runoff from herbicide used on row crops
Atrazine	ppb	1	0.15	0.5	Range Average	ND ND		Runoff from herbicide used on row crops and along highways
Bentazone	ppb	18	200	2	Range Average	ND ND		Runoff from herbicide used on rice, alfalfa, and grapes
Carbofuran	ppb	18	0.7	5	Range Average	ND ND		Leachings of soil fumigant used on rice, alfalfa, and grapes
Chlorpyrifos	ppd	100	30	100	Range Average	ND ND		Residue of banned insecticide
2,4-D	ppb	70	20	10	Range Average	ND ND		Runoff from herbicide used on row crops, canola, leeks and aquatic weeds
Dalapon	ecb	200	750	10	Range Average	ND ND		Runoff from herbicide used on mids-of-ways, roads, and landscapes
Dichloroacetic acid	ecb	200	3	10	Range Average	ND ND		Banned nematocides that may still be present in soils
Dinoseb	ecb	7	14	2	Range Average	ND ND		Runoff from herbicide used on soybeans, vegetables, and fruits
Diuron	ecb	20	6	4	Range Average	ND ND		Runoff from herbicide used for terrestrial and aquatic weeds
Endosulfan	ecb	100	94	45	Range Average	ND ND		Residue of banned insecticide and aquatic weeds
Ethion	ecb	2	0.3	0.1	Range Average	ND ND		Residue of banned insecticide and rodenticide
Ethylene Dibromide (EDB)	ppd	50	10	20	Range Average	ND ND		Petroleum refinery discharges, underground gas tank leaks
Glyphosate	ppb	700	900	25	Range Average	ND ND		Runoff from herbicide use
Heptachlor	ppd	10	8	10	Range Average	ND ND		Residue of banned insecticide
Heptachlor Epoxide	ppd	10	6	10	Range Average	ND ND		Breakdown product of heptachlor
Lindane	ppd	200	32	200	Range Average	ND ND		Runoff from insecticide used on cattle, lumber, and gardens
Methoxychlor	ppb	30	0.09	10	Range Average	ND ND		Runoff from insecticide uses
Molinate (Ordam)	ppb	20	1	2	Range Average	ND ND		Runoff from herbicide used on rice
Ordnal (Vydale)	ppb	50	26	20	Range Average	ND ND		Runoff from insecticide uses
Pentachloronitrobenzene	ecb	1	0.3	0.2	Range Average	ND ND		Discharge from wood preserving factories, other insecticide and herbicide uses
Picloram	ecb	500	168	1	Range Average	ND ND		Herbicide runoff
Polychlorinated Biphenyls (PCBs)	ecb	500	90	500	Range Average	ND ND		Runoff from landfills, discharge of waste chemicals
Simazine	ecb	4	4	1	Range Average	ND ND		Herbicide runoff
Thiobenzothiazole	ecb	70	42	1	Range Average	ND ND		Runoff from rice herbicide
2,4,5-TP (Silvex)	ecb	50	3	1	Range Average	ND ND		Residue of banned herbicide
Triphenylethylene	ecb	3	0.04	1	Range Average	ND ND		Runoff from insecticide used on coffee and cattle
<b>Semi-Volatile Organic Compounds</b>								
Acetamide	NA	TT	(b)	NA	Range	ND		Water treatment chemical impurities
Benzonitrile	ecb	200	7	100	Range	ND		Leachings from water storage tank linings and distribution lines
Di(2-ethylhexyl)adipate	ppb	400	200	5	Range	ND		Discharge from chemical factories
Di(2-ethylhexyl)phthalate	ppb	4	12	3	Range	ND		Chemical factory discharge, inert ingredient in pesticides
Epichlorohydrin	NA	TT	(b)	NA	Range	ND		Water treatment chemical impurities
Hexachlorobenzene	ppb	1	0.03	0.5	Range	ND		Discharge from metal refineries & synchemicals factories, wastewater chlorination reaction by-product
Hexachlorocyclopentadiene	ppb	50	2	1	Range	ND		Discharge from chemical factories
2,3,7,8-TCDF (Dioxin)	ppb	30	0.05	5	Range	ND		Waste incineration emissions, chemical factory discharge
<b>Volatile Organic Compounds</b>								
Benzene	ppb	1	0.15	0.5	Range	ND		Plastics factory discharge, gas tanks and landfill leaching
Carbon Tetrachloride	ppd	500	100	500	Range	ND		Discharge from chemical plants and other industrial waste
1,2-Dichlorobenzene	ppb	600	600	0.5	Range	ND		Discharge from industrial chemical factories
1,4-Dichlorobenzene	ppb	5	6	0.5	Range	ND		Discharge from industrial chemical factories
1,1-Dichloroethane	ppb	5	3	0.5	Range	ND		Extraction and degreasing solvent, fumigant
1,2-Dichloroethane	ecb	500	400	500	Range	ND		Discharge from industrial chemical factories
1,1-Dichloroethene	ecb	6	10	0.5	Range	ND		Discharge from industrial chemical factories
cis-1,2-Dichloroethene	ecb	6	13	0.5	Range	ND		Industrial chemical factory discharge, by-product of TCE and PCE biodegradation
trans-1,2-Dichloroethene	ecb	10	50	0.5	Range	ND		Industrial chemical factory discharge, by-product of TCE and PCE biodegradation
Dichloromethane	ecb	5	4	0.5	Range	ND		Discharge from pharmaceutical and chemical factories
Methylene Chloride	ecb	5	0.5	0.5	Range	ND		Industrial chemical factory discharge, primary component of some fumigants
1,3-Dichloropropane	ecb	500	200	500	Range	ND		Runoff from nematocides used on croplands
1,3-Dichloropropane	ppb	300	300	0.5	Range	ND		Petroleum refinery discharge, industrial chemical factories
Ethylbenzene	ppb	13	13	3	Range	ND		Gasoline discharge from watercraft engines
Methyl tert-butyl ether (MTBE (L))	ecb	70	70	0.5	Range	ND		Discharge from industrial, agricultural, and chemical factories, and dry cleaners
Monochlorobenzene	ecb	100	0.6	0.5	Range	ND		Rubber and plastics factories discharge, landfill leachings
Shurene	ecb	1	0.1	0.5	Range	ND		Discharge from industrial, agricultural, and chemical factories, solvent uses
1,1,2,2-Tetrachloroethane	ppb	5	0.06	0.5	Range	ND		Discharge from factories, dry cleaners, and auto shops
Toluene	ecb	150	150	0.5	Range	ND		Discharge from petroleum and chemical refineries
1,2,4-Trichlorobenzene	ppb	5	5	0.5	Range	ND		Discharge from textile-finishing factories
1,1,1-Trichloroethane	ppb	200	1000	0.5	Range	ND		Metal degreasing site discharge, manufacture of food emulsifiers
1,1,2-Trichloroethane	ppb	5	0.3	0.5	Range	ND		Discharge from industrial chemical factories
1,2,3-Trichloropropane	ppd	5	0.7	5	Range	ND		Cleaning and degreasing solvent, also associated with pesticide products
Trichloroethylene (TCE)	ppb	5	1.7	0.5	Range	ND		Discharge from metal degreasing sites and other factories
Trichlorofluoromethane (Freon-11)	ppb	150	1300	5	Range	ND		Industrial factory discharge, degreasing solvent, propellant
1,1,2-Trifluoro-1,2,2-Tetrafluoroethane (Freon-113)	ppm	1.2	4	0.01	Range	ND		Discharge from metal degreasing sites and other factories, dry cleaning solvent, propellant
Vinyl Chloride	ppb	500	50	500	Range	ND		Leachings from PVC piping, plastic factory discharge, by-product of TCE and PCE biodegradation
Xylene	ppm	1,750	3.6	0.0005	Range	ND		Discharge from petroleum and chemical refineries, fuel solvent
<b>INORGANIC CHEMICALS</b>								
Aluminum (d)	ppm	1	0.6	0.05	Range	ND-0.22		Natural deposits erosion
Arsenic	ppb	6	1	6	Range	0.07		Residue from water treatment process
Boron	ppb	10	0.004	2	Range	ND		Petroleum refinery discharges, fire retardants, solder, electronics
Cadmium	ppb	7	7	0.2	Range	ND		Natural deposits erosion, glass and electronics production wastes
Asbestos	MFL	7	7	0.2	Range	ND		Asbestos cement pipes internal corrosion, natural deposits erosion
Barium	ecb	1000	2000	100	Range	ND		Oil and metal refineries discharge
Beryllium	ecb	4	1	1	Range	ND		Discharge from metal refineries, aerospace, and defense industries
Cadmium	ecb	5	0.04	1	Range	ND		Internal corrosion of galvanized pipes, natural deposits erosion
Chromium	ecb	50	1100	10	Range	ND		Discharge from steel and auto mills, natural deposits erosion
Chromium VI	ppb	NA	0.02	NA	Range	0.11		Runoff from natural deposits, discharge from industrial waste factories
Copper (d.f)	ppm	1.3	0.3	0.05	Range	ND		Runoff from natural deposits, discharge from industrial waste factories
Cyanide	ppb	150	150	100	Range	ND		natural deposits erosion
Fluoride (b)	ppm	2.0	1	0.1	Range	0.7-2		Discharge from steel and auto mills, natural deposits erosion
Fluoride (treated)	ppm	2.0	1	0.1	Range	0.5-0.7		Discharge from steel and auto mills, natural deposits erosion
Lead (f)	ppb	15	0.2	5	Range	ND		House pipes internal corrosion, erosion of natural deposits
Mercury	ppb	2	1.2	1	Range	ND		Erosion of natural deposits, factory discharge, landfill runoff
Nickel	ppb	100	12	10	Range	ND		Erosion of natural deposits, discharge from metal factories
Nitrate (as N) (h)	ppm	10	10	0.4	Range	ND-0.4		Runoff and leachings from fertilizer use, septic tank and sewerage, natural deposits erosion
Nitrate (as N)	ppm	1	1	0.4	Range	ND		Runoff and leachings from fertilizer use, septic tank and sewerage, natural deposits erosion
Phosphate (i)	ecb	6	1	2	Range	ND		Industrial waste discharge
Selenium	ecb	50	30	5	Range	ND		Refineries, mines, and chemical waste discharge, runoff from livestock lots
Thallium	ecb	2	0.1	1	Range	ND		Leachings from ore processing, electronics factory discharge
<b>RADIOLOGICALS (n)</b>								
Gross Alpha	pCi/L	15	(b)	0	Range	ND-4		Erosion of natural deposits
Gross Beta	pCi/L	50	(b)	4	Range	4.5-5.1		Decay of natural and man-made deposits

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						Twin Oaks Valley Water Treatment Plant	Average	
Radium-226	pCi/L	NA	0.05	1	Average	ND	ND	Erosion of natural deposits
Radium-228	pCi/L	NA	0.019	1	Average	ND	ND	Erosion of natural deposits
Combined Radium-226 + 228 (i)	pCi/L	5	(i)	NA	Average	ND	ND	Erosion of natural deposits
Strontium-90	pCi/L	8	0.35	2	Average	ND	ND	Decay of natural and man-made deposits
Tritium	pCi/L	20000	400	1000	Average	ND	ND	Decay of natural and man-made deposits
Uranium	pCi/L	20	0.43	1	Average	ND	ND	Erosion of natural deposits
<b>DISINFECTION BY PRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS (m)</b>								
Total Trihalomethanes (TTHM) (m)	ppb	80	NA	1	Highest TTHM	40	40	By-product of drinking water chlorination
Halacetic Acids (five) (HAA5) (i)	ppb	60	NA	1	Highest HAA5	10	10	By-product of drinking water chlorination
Bromate (p)	ppb	10	0.1	1	Average	1.6	1.6	By-product of drinking water ozonation
Total Chlorine Residual	ppm	14.0	14.0	NA	Average	2.6	2.6	Drinking water disinfectant added for treatment
Total Organic Carbon (TOC)	ppm	TT	NA	0.30	Average	2.3	2.3	Various natural and man-made sources. TOC is a precursor for the formation of disinfection byproducts
<b>SECONDARY STANDARDS--Aesthetic Standards</b>								
Aluminum (d)	ppb	200	NA	50	Average	10	10	Residue from water treatment process; natural deposits erosion
Chloride	ppm	250	NA	NA	Average	110	110	Runoff/leaching from natural deposits; sewerage influence
Color	Color Units	15	NA	NA	Average	ND	ND	Naturally occurring organic materials
Copper (d)	ppm	1.0	NA	0.05	Single	ND	ND	Internal corrosion of household pipes; natural deposits erosion; acid preservation leaching
Fluoride (MCL)	ppb	500	NA	NA	Single	ND	ND	Municipal and industrial waste discharges
Iron	ppb	300	NA	100	Average	ND	ND	Leaching from natural deposits; industrial wastes
Manganese	ppb	50	ML = 500	20	Average	ND	ND	Leaching from natural deposits
MTBE (d a)	ppb	5	NA	3	Average	ND	ND	Gasoline discharge from watercraft engines
Odor Threshold	TON	3	NA	1	Single	ND	ND	Naturally-occurring organic materials
Silver	ppb	100	NA	10	Sample	ND	ND	Industrial discharges
Specific Conductance	uS/cm	900	NA	NA	Sample	900	900	Substances that form ions in water; sewerage influence
Sulfate	ppm	250	NA	0.5	Average	217	217	Runoff/leaching from natural deposits; industrial wastes
Thiocarbam (d)	ppb	1	NA	1	Average	ND	ND	Runoff/leaching from rice herbicide
Total Dissolved Solids (TDS)	ppm	500	NA	NA	Sample	610	610	Runoff/leaching from natural deposits; sewerage influence
Turbidity (a)	NTU	5	NA	0.1	Average	ND	ND	Soil runoff
Zinc	ppm	5.0	NA	0.05	Sample	ND	ND	Runoff/leaching from natural deposits; industrial wastes
<b>OTHER PARAMETERS</b>								
<b>CHEMICALS</b>								
Acarbathor	ppb	NA	NA	2	Range	ND	ND	Herbicide runoff
Achlor	ppb	NA	NA	2	Average	ND	ND	Herbicide runoff
Alkalinity (l)	ppm	NA	NA	NA	Single	130	130	Runoff/leaching from natural deposits; industrial wastes
Boron	ppb	NL = 1000	NA	100	Single	130	130	Runoff/leaching from natural deposits; industrial wastes
Calcium	ppm	NA	NA	NA	Average	87.88	87.88	
Chlorate	ppb	NL = 300	NA	20	Sample	250-140	250-140	By-product of drinking water chlorination; industrial processes
Conductivity (r)	uS/cm	NA	NA	NA	Sample	335	335	Elemental balance in water - affected by temperature, other factors
Iron Aggressiveness Index	AI	NA	NA	NA	Sample	10	10	Elemental balance in water - affected by temperature, other factors
Lang Saturation Index	SI	NA	NA	NA	Sample	0.30	0.30	Runoff from pesticide used on crops and residential uses
Dimethoate	ppb	NA	NA	0.7	Average	ND	ND	Runoff from pesticide used on crops and residential uses
Hardness (l)	ppm	NA	NA	NA	Sample	270	270	
Magnesium	ppm	NA	NA	NA	Average	26	26	
Metalachlor	ppb	NA	NA	1	Range	ND	ND	Herbicide runoff
pH	pH	NA	NA	NA	Range	8.3	8.3	
pot	Units	NA	NA	NA	Average	8.3	8.3	
Potassium	ppm	NA	NA	NA	Average	4.8	4.8	
Radon (i)	pCi/L	NA	NA	100	Sample	ND	ND	
Sodium	ppm	NA	NA	NA	Average	86.88	86.88	
Vanadium	ppb	NL = 50	NA	3	Sample	ND	ND	Naturally-occurring; industrial waste discharge
N-Nitrosodimethylamine (NDMA) (i)	ppb	NL=10	NA	5	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosodimethylamine (NDMA) (i)	ppb	NL=10	NA	2	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
N-Nitroso-di-n-butylamine (NDNB) (i)	ppb	NA	NA	4	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
N-Nitroso-di-n-octylamine (NDNO) (i)	ppb	NA	NA	7	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosodimethylamine (NDMA) (i)	ppb	NA	NA	3	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
N-Nitrosodimethylamine (NDMA) (i)	ppb	NA	NA	2	Sample	ND	ND	By-product of drinking water chloramination; industrial processes
Dichlorodifluoromethane (Freon 12)	ppb	NL = 1000	NA	0.5	Average	ND	ND	Industrial waste discharge
Diethyl-ether	ppb	NA	NA	3	Average	ND	ND	Used as gasoline additive
Diethyl-ether	ppb	NA	NA	3	Average	ND	ND	Used as gasoline additive
Diethyl-ether	ppb	NA	NA	3	Average	ND	ND	Used as gasoline additive
Diethyl-ether	ppb	NL = 12	NA	2	Sample	ND	ND	MTBE breakdown product; used as gasoline additive
<b>OTHER PARAMETERS - VOLUNTARY SAMPLING</b>								
Perfluorooctanoic Acid (PFOS)	ppb	ND=5.1	NA	NA	Single	ND	ND	
Perfluorododecanoic Acid (PFDS)	ppb	ND=8.5	NA	NA	Single	1	1	
<b>ABBREVIATIONS AND FOOTNOTES</b>								
<b>Abbreviations</b>								
AI	Aggressiveness Index	N	Nitrogen					
AL	Action Level	NA	Not Applicable					
CFE	Combined Filter Effluent	NL	Notification Level					
CFU	Colony-Forming Units	ND	None Detected					
LRAA	Local/Annual Running Annual Average; Highest of all	NTU	Nephelometric Turbidity Units					
	Local/Annual Running Annual Average; Highest of all	pCi/L	picocuries per liter					
	Annual Averages calculated as average of all samples collected within a 12-month period	PHG	Public Health Goal					
DBP	Disinfection By-Products	ppb	parts per billion or micrograms per liter (uS/L)					
DLR	Detection Limits for purposes of Reporting	ppm	parts per million or milligrams per liter (mg/L)					
HPC	Heterotrophic Plate Count	ppq	parts per quadrillion or picograms per liter (pg/L)					
MBAS	Methylene Blue Active Substances	ppb	parts per billion or micrograms per liter (uS/L)					
MCL	Maximum Contaminant Level	RAA	Running Annual Average					
MCLG	Maximum Contaminant Level Goal	TOC	Total Organic Carbon					
MFL	Maximum Filter Level	TON	Threshold Odor Number					
MREL	Maximum Residual Disinfectant Level	TT	Treatment Technique					
MRLDL	Maximum Residual Disinfectant Level Goal	uS/cm	microSiemens per centimeter; or micromho per centimeter (umho/cm)					
		TOVWTP	Twin Oaks Valley Water Treatment Plant					
<b>Footnotes</b>								
(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 (DIBP) Rule. Compliance was based on the LRAA.					
(b)	Total coliform MCLs: No more than 5.0% of the monthly samples may be total coliform-positive. In 2022, 227 samples were analyzed and all samples were negative for total coliforms. The MCL was not violated.	(n)	Average and range for the treatment plant effluent were taken from daily and monthly samples for TTHM and HAA5.					
(c)	E.coli MCLs: The occurrence of zero (0) consecutive total coliform-positive samples, one of which contains E. coli, constitutes an acute MCL violation. The MCL was not violated.	(o)	DLR = 1.0 ppb for each HAAS analyte (dichloroacetic acid, trichloroacetic acid, monochloroacetic acid, and dibromoacetic acid) except for monochloroacetic acid which has a DLR = 2.0 ppb.					
(d)	Aluminum, copper, MTBE, and thiocarbam have both primary and secondary standards.	(p)	Running annual average was calculated from quarterly results of monthly and daily samples. Bromate reporting level is 1 ppb.					
(e)	MTBE reporting level is 0.5 ppb.	(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.					
(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 consumer's 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.	(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.					
(g)	TOVWTP was in compliance with all provisions of the State's Fluoridation System Requirements.	(t)	Alkalinity and hardness was based on CaCO3.					
(h)	State MCL is 45 mg/L as nitrate, which equals 10 mg/L as N.	(u)	Sampling done every 3 years. Results listed are from 2021. Next sampling is 2024.					
(i)	TOVWTP's perchlorate reporting level is 2 ppb, which is below the state DLR of 4 ppb.							
(j)	Data was collected from one quarter of monitoring in 2021-2022. TOVWTP's next required internal monitoring will be performed during the period of 2023-2024.							
(k)	The gross beta particle activity MCL is 4 million/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.							

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