



# 2019

Annual Drinking  
Water Quality Report



## City of San Diego's Tap Water Supply Meets All State and Federal Health Standards in 2019

The City of San Diego is committed to providing you with a clean, safe and stable water supply. It's the priority of every employee of the City's Public Utilities Department. Those efforts matter. Based on the water quality monitoring data collected in 2019, the City's tap water met all state and federal drinking water health standards, which are the primary standards for treating and monitoring water. The U.S. Environmental Protection Agency (EPA) and the California Division of Drinking Water mandate all water agencies to produce an annual document educating customers about their drinking water quality for the previous year. This annual Drinking Water Quality Report details the origin of the City's water supply, what it contains and how it meets health standards.

### A Message from the Director

When you turn on a faucet at your home, you're receiving a resource that has travelled hundreds of miles, and is the result of dedicated work by many men and women to make sure you receive clean and safe water.

Most of our tap water is imported and is treated through a multi-stage process for quality and safety. The water is delivered to your home via a complex system of storage tanks, pumps and pipelines. These processes, as well as regularly maintaining and repairing the City's water and wastewater systems, takes a team of more than 1,600 people to bring you and dispose of the water you use every day for drinking, cooking, cleaning and irrigating.

We are proud of our work, and we consistently look for ways to improve our efficiency and procedures to provide you the best possible service.

We are very pleased to present to you this 2019 Drinking Water Quality Report where you'll find details about our water supply, treatment process, water content and other information. If you have any questions or need assistance from the Public Utilities Department, please contact us. We are ready to help.

Sincerely,

Shauna Lorance  
Director

City of San Diego Public Utilities Department

### CONTACT

Public Utilities Emergency Hotline..... 619-515-3525  
General and Billing Information..... 619-515-3500  
customer@sandiego.gov  
Water Quality Lab ..... 619-668-3232  
drinkingwaterquality@sandiego.gov

Capital Improvements Projects ..... 619-533-4207  
City Reservoirs Recreation ..... 619-465-3474  
Pure Water Program ..... 619-533-6638  
Storm Water Pollution Prevention..... 619-235-1000  
Water Waste/Recycled Water ..... 619-533-5271

### VISIT

City of San Diego Public Utilities..... sandiego.gov/public-utilities  
San Diego County Water Authority ..... sdcwa.org  
Metropolitan Water District ..... mwdh2o.com  
California Division of Drinking Water ..... waterboards.ca.gov  
Think Blue ..... thinkblue.org  
U.S. EPA ..... water.epa.gov/drink  
American Water Works Association..... awwa.org  
Be Water Wise ..... bewaterwise.com  
Pure Water Program ..... purewatersd.org

### ENGAGE

  
**Get It Done App**  
sandiego.gov/get-it-done

  
facebook.com/CityofSanDiego

  
instagram.com/thecityofsandiego

  
https://nextdoor.com/city/san-diego--ca/

  
twitter.com/CityofSanDiego

  
youtube.com/TheCityofSanDiego



### How Can I Get More Involved?

Public Utilities Department matters are often discussed at San Diego City Council meetings. Meetings are held Monday and Tuesday of most weeks. The meetings can also be viewed on CityTV – Channel 24 on Cox Communications and Spectrum, or Channel 99 on AT&T. CityTV also streams council meetings online at [sandiego.gov](http://sandiego.gov). For meeting location, date, time and items involving the Public Utilities Department, visit [sandiego.gov/city-clerk/officialdocs/legisdocs/dockets](http://sandiego.gov/city-clerk/officialdocs/legisdocs/dockets) for the current Council agenda.



## Water Supply - What's in Your Water Before It's Treated?

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals that are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, agricultural application and septic systems.
- Radioactive contaminants, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) and the State Water Resources Control Board (State Board) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk.



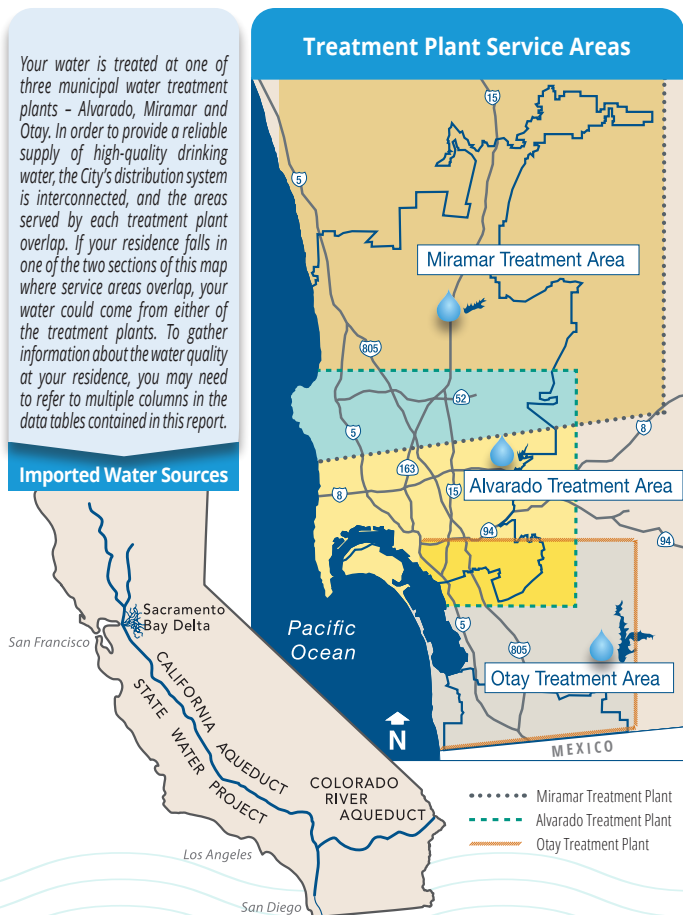
## Imported Water Supply and the Impact on Water Quality

The City of San Diego currently imports most of its water supply, the bulk of which is raw (untreated) water purchased from the San Diego County Water Authority. All raw water is treated before entering the City's drinking water distribution system. Less than 10% of the imported water purchased from the Water Authority is a blend of treated water from the Metropolitan Water District's Skinner Water Treatment Plant, the San Diego County Water Authority's Twin Oaks Valley Water Treatment Plant and the Carlsbad Desalination Plant.

Most of the imported water from the Water Authority is a blend from the Colorado River and State Water Project (see map to the left). Throughout the year, the ratio of water from each source changes. The constituents that make up the City's source water are influenced by the water source, climate, geology and the land activities that they flow through. The City continually monitors our source water and adjusts its treatment process to ensure that the water is always healthy and safe.

## Imported Water Sources

Your water is primarily treated at one of three municipal water treatment plants – Alvarado, Miramar and Otay (a small portion is treated supplied by Metropolitan Water District's Skinner Water Treatment Plant and the San Diego County Water Authority's Twin Oaks and Carlsbad Desalination water treatment plants). To provide a reliable supply of high-quality drinking water, the City's distribution system is interconnected, and the areas served by each treatment plant overlap. If your residence falls in one of the two sections of this map where service areas overlap, your water could come from either of the relevant treatment plants. To gather information about the water quality at your residence, you may need to refer to multiple columns in the data tables contained in this report.



## Improving Services through Technology and Upgrades

The Public Utilities Department continues to invest in infrastructure, advanced technologies and new resources to support and improve our continuing efforts to use water wisely. These changes are part of our commitment to San Diegans to improve services to our customers.



*All cast iron water mains will be replaced by 2024.*

### Replacing Old Infrastructure for More Reliable Service

The City's continuing efforts to replace old cast iron water mains have played a major part in the decrease in pipeline breaks. Since 2013, the City has replaced approximately 220 miles of water mains across the city. The City's goal is to replace the remaining 60 miles of cast iron mains by 2024.



### Installing Smart Meters to Monitor Water Use

Smart meters – or Advanced Meter Infrastructure (AMI) – are being installed throughout the city as old manual meters need to be replaced. The City is creating an implementation plan to ensure our citywide effort to replace all manually-read meters with AMI is completed successfully. These meters wirelessly transmit usage data to the City, which is then available to customers online and via a mobile app.

### Creating a New Water Resource

Work continues on the City's Pure Water Program that will produce 30 million gallons per day of purified water, reducing the City's dependence on imported water and increasing reliability of our supply. Recent milestones have included regulatory approval for use of Pure Water as a public water supply and early site work at the City's North City Water Reclamation Plant and future North City Pure Water Facility.





## Helping San Diego Become a More Sustainable City

As part of its Climate Action Plan, the City of San Diego is committed to sustainability and the efficient use of resources, which are cornerstones of the City's Sustainability Program. The City's Public Utilities Department plays an important role in helping achieve the City's overarching goal of sustainability in two key areas: water and energy.



### Water Conservation

The City has several resources available to help residents and businesses conserve water. Efficient water use is a way of life in San Diego, and it is important to remember that permanent water use restrictions remain in effect regardless of the drought status.

*"Efficient water use  
is a way of life in San Diego"*



### Pure Water San Diego

Pure Water San Diego is the City's phased, multi-year program that will provide one-third of San Diego's water supply locally by the end of 2035.



### Recycled Water

The City's two water reclamation plants treat wastewater to a level that is approved for irrigation, manufacturing and other non-drinking or non-potable purposes. Recycled water gives San Diego a dependable, year-round and locally controlled water resource for these uses.

### Water Supply

An adequate and reliable water supply is vital for the future of San Diego. The Public Utilities Department is actively pursuing ways to increase our water supplies.



### Renewable Energy

The Public Utilities Department has about 23 megawatts total of City-owned and privatized on-site renewable energy generation capacity using fuel sources such as landfill gas, digester gas and solar.

### Wastewater Treatment Monitoring

As part of the Public Utilities Department's commitment to leadership in environmental management and protection, extensive monitoring programs are conducted for its wastewater treatment facilities.



### Ocean Monitoring

The Ocean Monitoring Program is the preeminent leader in studying the effects of our regional wastewater treatment processes on the marine environment.



For more information about these Public Utilities Department projects and programs, please visit [sandiego.gov/public-utilities/sustainability](http://sandiego.gov/public-utilities/sustainability).

# How Do We Make Water Drinkable?

## WATER TREATMENT

The City's Public Utilities Department provides high-quality drinking water by utilizing proven technology, upgraded facilities and state-certified operators. Water is treated using several processes, with each process providing additional water quality improvements. Using several treatment processes provides multiple barriers for added levels of safety. Our treatment plants employ a combination of time-tested conventional water treatment processes and innovative disinfection strategies. Both Alvarado and Miramar water treatment plants use ozone for primary disinfection, while the Otay Water Treatment Plant uses chlorine dioxide. Conventional water treatment consists of coagulation, flocculation, sedimentation and sand/multimedia filtration. This cost-effective, proven method of treatment is used throughout the modern world.



## STAGES OF OUR WATER TREATMENT

**Watershed protection:** Protecting the watersheds prevents contamination of our water supply and is the most cost-effective process in water treatment. Extensive measures are taken to prevent contamination of our local and imported water. If you see "No Swimming" or "No Dumping" signs posted near water supplies, this is for the protection of your drinking water. The latest Watershed Sanitary Survey, which contains information on the City's watersheds, including water quality and vulnerabilities, is available at: [sandiego.gov/water/quality/environment/sanitarysurvey](http://sandiego.gov/water/quality/environment/sanitarysurvey).

**Coagulation:** This is the chemical process of rapidly mixing coagulants into the water entering the water treatment plant. Many of the particles in the source water have negative charges, causing them to repel each other, much like two magnets when the negative ends are put together. Coagulation changes these negative charges to neutral.

**Flocculation:** Coagulated water is slowly mixed causing the neutral particles to collide. When the collisions occur, the particles clump together forming floc. As the floc is formed, particles in the water are trapped within the floc. The floc now looks like snowflakes suspended in the water.

**Sedimentation:** The floc particles are heavier than water. Mixing is stopped and the water slowly flows through the sedimentation basins, during which the

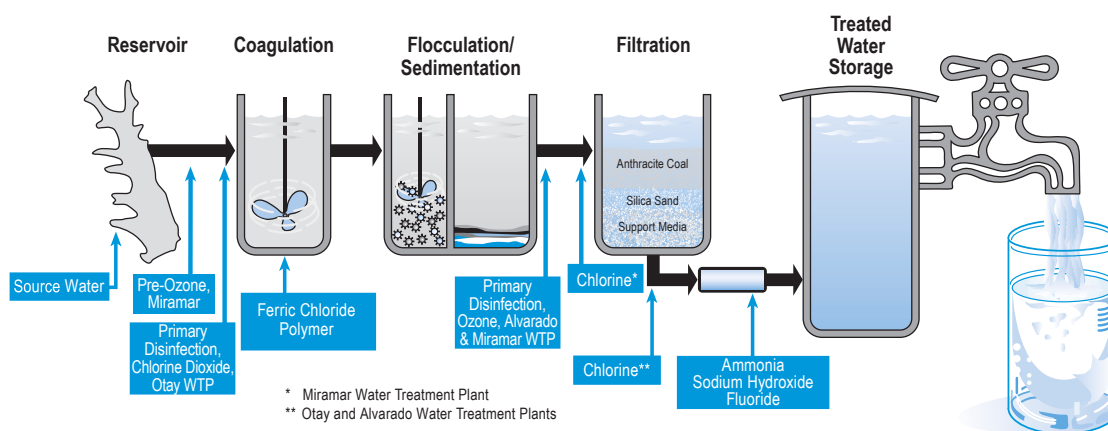
floc settles to the bottom and is removed. The clear water is collected from the top of the sedimentation basins.

**Disinfection, Primary:** Drinking water is further treated to remove or inactivate viruses, bacteria and other pathogenic organisms. Disinfection is accomplished in a variety of methods. The Alvarado and Miramar water treatment plants use ozone as the primary disinfectant. The Otay Water Treatment Plant uses chlorine dioxide as the primary disinfectant. These are advanced disinfection processes and have the advantage of providing higher quality water with better taste.

**Filtration:** Water is passed through deep filtration beds to produce water that is crystal clear. Extremely small particles are removed during this process. San Diego's water treatment plants produce water with turbidity (cloudiness) significantly better than drinking water standards, indicating a highly effective treatment process and resulting in high-quality drinking water.

**Disinfection, Secondary:** Chloramines are created by adding chlorine and ammonia to the water. Chloramines help prevent microbial contamination from occurring in the water distribution system.

**Corrosion Control:** The corrosivity of the water is controlled by adjusting the pH.



## NOTICES OF VIOLATIONS

The San Diego County Water Authority experienced a treatment process failure at its regional treatment plant. Water in the treatment plant was not in contact with the proper dosage of ozone disinfectant for the required amount of time. On April 21-22, 2019, a segment of the disinfection treatment facility did not provide the intended disinfection of pathogens. Upon being notified of the malfunction, a review of the overall pathogen removal at the treatment plant was performed. It was determined however, unable to be confirmed, that the required reduction of pathogens was most likely achieved. The Water Authority implemented policy and engineering changes to immediately identify and correct improper valve conditions that led to the April 21-22 incident. Water Authority has prepared new procedures for ensuring that the continuous disinfection treatment facility is operating as designed and as required. Inadequately treated water may contain

disease causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches. Following a review of water quality data collected for calendar year 2019 by the City of San Diego (City), it became apparent that the City did not collect the one required Gross Alpha (GA) monitoring sample from the effluent of Alvarado Water Treatment Plant (WTP). The concentration of Gross Alpha from the Alvarado WTP is typically low and after realizing the oversight, the City collected a gross alpha make-up sample on March 25, 2020, from the Alvarado WTP effluent that exhibited a concentration below the detection limit for reporting (3 pCi/L). There was no risk to public health as a result of this violation. City is required to monitor drinking water for specific contaminants on a regular basis. The City of San Diego operates an extensive monitoring program for our source waters, treatment plants and distribution system and has never detected a contaminant in the drinking water at levels above state or federal limits.



# A CHANGE FOR THE BETTER...





BEGINS  
WITH  
YOU.


Did you know that San Diego's storm water system is separate from its water or wastewater system? Many people think that when water flows into a storm drain it is treated, but the storm drain system and the sewer system are not connected. Everything that enters storm drains flows untreated directly into our creeks, rivers, bays, beaches and ultimately the ocean.


That's why Think Blue, the City of San Diego's storm water outreach and education program, wants you to know that you have the power to keep trash, debris, sediments, metals, pesticides and other pollutants out of our storm drains and waterways by taking a few easy steps.

## How You Can Help


 **Sweep Up Around Your Yard:** Sweep up dirt, debris and yard waste and dispose of them properly. Yard waste has the potential to carry hazardous landscaping chemicals such as pesticides and fertilizers into the storm drain system and generate large amounts of bacteria if left to decompose in gutters, drains and local waterways.


 **Eliminate Over-Irrigation:** Prevent water from leaving your property so it won't carry pollutants into our storm drains during dry weather. Sweep hard surfaces instead of hosing them off with water, adjust and maintain sprinklers so they don't spray onto your driveway or sidewalk and fix leaks promptly.

 **When It Rains:** During the rainy season, redirect rain gutter downspouts to landscaped areas where the water can be absorbed and replenish groundwater or connect your downspout to a rain barrel to store the water for later use.

 **From Your Car:** Your car can be a source of automotive pollutants such as motor oil. It's important to check your car regularly for fluid leaks.

## Our Storm Water System

 **From Curb to Ocean:** The City of San Diego oversees the operation and maintenance of 48,000 storm drain structures, 900 miles of pipe and 14 pump stations designed to control flooding by moving rain water away from the public and property and properly transport it to local waterways.

 **Aging Infrastructure:** Maintenance of our storm water system is partially funded by a small storm water fee included in your water bill and supplemented by other City funds. It's estimated that almost \$900 million are needed in the next five years to fully fund the repairs and improvements required for the maintenance of this infrastructure and protect the quality of our waterways.

 **Vital to San Diego:** A fully functional and operational modern storm water system is important to the environmental and economic health of San Diego and is essential to our quality of life.

Think Blue appreciates everything you do to help protect our local waterways. Visit [ThinkBlue.org](http://ThinkBlue.org) for more information on how you can prevent pollution in our waterways.

To report storm water pollution in San Diego, call the Think Blue Hotline at 619-235-1000 or report it using the Get It Done App or on your desktop at [SanDiego.gov/getitdone](http://SanDiego.gov/getitdone).

# Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

## CRYPTOSPORIDIUM AND GIARDIA

*Cryptosporidium* and *Giardia* are microbial contaminants that are naturally present in the environment and found in surface water throughout the United States. Disinfection and filtration are highly effective in removing these contaminants; however, the disinfection and filtration methods cannot guarantee 100% removal. In 2019 our monitoring detected *Giardia* in one of the nine surface water sources that reach the City of San Diego water treatment plants; subsequent monitoring in our treated drinking water showed an absence of *Giardia* in water delivered to our customers.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline at 1-800-426-4791. For detailed information on drinking water regulations, visit the state Division of Drinking Water (DDW) website at [waterboards.ca.gov/drinking\\_water](http://waterboards.ca.gov/drinking_water).

## HOW TO READ THE TABLES

The tables on the following pages list parameters that DDW requires the City to monitor, which may be associated with primary (health), secondary (aesthetic) or no established standards. These tables summarize monitoring from January through December 2019. The tables list all parameters that were detected at or above DDW's Detection Limit for Purposes of Reporting (DLR). The map on page 2 of this report can be used to determine the treatment plant or plants that supply water to your residence. Less than 10% of San Diego's total water use comes from purchased treated water, which is a blend of water treated at the Metropolitan Water District's Skinner Water Treatment Plant, the San Diego County Water Authority's Twin Oaks Valley Water Treatment Plant, and the Carlsbad Desalination Plant.



## DEFINITION OF TERMS

**Action Level (AL):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**Location-based Running Annual Average (LRAA):** The average of the most recent four quarters of monitoring performed at a distinct location in the distribution system. **Location-based Running Annual Averages** are calculated quarterly using 12 months of data and may include values obtained in 2018.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. **Primary Maximum Contaminant Levels** are set as close to the Public Health Goals or Maximum Contaminant Level Goals as is economically and technologically feasible. **Secondary Maximum Contaminant Levels** are set to protect the odor, taste and appearance of drinking water.

**Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected health risk. **Maximum Contaminant Level Goals** are set by the U.S. Environmental Protection Agency.

**Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. **Maximum Residual Disinfectant Level Goals** do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**Notification Level (NL):** Health-based advisory levels established by the Division of Drinking Water for chemicals in drinking water that lack Maximum Contaminant Levels. When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply.

**Public Health Goal (PHG):** The level of a contaminant in drinking water that does not pose a significant risk to health. **Public Health Goals** are not regulatory standards.

**Primary Drinking Water Standard (PDWS):** Maximum Contaminant Levels, Maximum Residual Disinfection Levels and treatment techniques for contaminants that affect health, along with their monitoring and reporting requirements.

**Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

## ABBREVIATIONS

**A:** absent

**CA SMCL:** California Secondary Maximum Contaminant Level

**CU:** color units

**DLR:** detection limit for reporting

**gr/Gal:** grains per gallon

**MDL:** City of San Diego Water Quality Laboratory Method Detection Limit – the lowest quantifiable concentration of a measured parameter detectable by the laboratory.

**mL:** milliliter

**n/a:** not applicable

**ND:** not detected (less than DLR, where applicable)

**NTU:** nephelometric turbidity units

**OU:** odor units

**pCi/L:** picocuries per liter (a measure of radiation)

**ppb:** parts per billion or micrograms per liter (µg/L) – [1 ppb = 0.001 ppm]

**ppm:** parts per million or milligrams per liter (mg/L) – [1 ppm = 1,000 ppb]

**µS/CM:** micro-siemens/centimeter

< less than

> greater than



# ENVIRONMENTAL MONITORING AND TECHNICAL SERVICES

## CONSUMER CONFIDENCE REPORT DATA - 2019

### PRIMARY STANDARDS (MANDATORY HEALTH RELATED STANDARDS)

CHEMICAL PARAMETERS	UNITS	MCL	PHG	DLR	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER		MAJOR SOURCES IN DRINKING WATER
					ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Aluminum	ppm	1	0.6	0.05	ND	ND - ND	ND	ND - ND	ND	ND - ND	ND	ND - 0.10	Erosion of natural deposits; residue from some surface water treatment processes
Arsenic	ppb	10	0.004	2	ND	ND - ND	ND	ND - ND	ND	ND - ND	ND	ND - 3	Erosion of natural deposits; glass and electronics production waste
Barium	ppm	1	2	0.1	ND	ND - 0.1	ND	ND - ND	ND	ND - ND	ND	ND - ND	Erosion of natural deposits; discharges of oil drilling wastes
Fluoride (naturally occurring)	ppm	2.0	1	0.1	0.2	0.1 - 0.3	0.2	0.1 - 0.3	0.3	0.2 - 0.5	0.4	0.1 - 0.8	Erosion of natural deposits
Fluoride (treatment-related)*	ppm	2.0	1	0.1	0.4	0.2 - 0.7	0.5	0.2 - 0.7	0.5	0.3 - 0.6	0.7	0.3 - 0.8	Water additive that promotes strong teeth; erosion of natural deposits
Nitrate (as N)	ppm	10	10	0.4	ND	ND - ND	ND	ND - ND	ND	ND - 0.5	ND	ND - 0.4	Runoff and leaching from fertilizer use; erosion of natural deposits
Selenium	ppb	50	30	5	ND	ND - ND	ND	ND - ND	ND	ND - ND	ND	ND - 6	Erosion of natural deposits; refineries, mines, and chemical waste discharge

\* Note: Optimal Fluoride Level as established by US Dept. of Health and Human Services and the State Water Resources Control Board is 0.7 ppm.

\* Note: Optimal Fluoride Level as established by US Dept. of Health and Human Services and the State Water Resources Control Board is 0.7 ppm.

Primary standards (MCLs) are developed for the purpose of protecting the public from possible health risks associated with long-term exposure to contaminants. In this table there are six primary standards listed, which means that of the many primary standards set by DDW and the EPA, only these were detected at or above the DLR in San Diego's drinking water. These results are significantly below their respective MCLs. In general, no health hazard is expected to exist when contaminant levels are below a Primary MCL. A list of the parameters which were analyzed for, but not detected, in San Diego's drinking water is posted at [sandiego.gov/public-utilities/water-quality/water-quality-reports](http://sandiego.gov/public-utilities/water-quality/water-quality-reports).

California state law requires water agencies with more than 10,000 water service connections to supplement naturally-occurring fluoride in their drinking water. Our water system complies with this requirement to help prevent dental cavities in consumers. In 2019, the City of San Diego's source waters contained naturally-occurring fluoride between 0.1 and 0.8 ppm. State regulations require water producers to supplement this naturally-occurring fluoride to an optimum dose of 0.7 ppm. In 2019 treated water had fluoride concentrations ranging from 0.2 to 0.8 ppm, with average values of 0.4 to 0.7 ppm. Information about fluoridation, oral health, and current issues is available at [cdc.gov/fluoridation/index.html](http://cdc.gov/fluoridation/index.html).

RADIOACTIVE PARAMETERS	UNITS	MCL	PHG (MCLG)	DLR	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER		MAJOR SOURCES IN DRINKING WATER
					ALVARADO^		MIRAMAR^		OTAY^				
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	
Gross Alpha Particle Activity	pCi/L	15	(0)	3	4	n/a	ND	n/a	6	n/a	ND	ND - 4	Erosion of natural deposits
Gross Beta Particle Activity	pCi/L	50*	(0)	4	ND	n/a	ND	n/a	4	n/a	ND	ND - 5	Decay of natural and man-made deposits
Uranium	pCi/L	20	0.43	1	2	n/a	1	n/a	ND	n/a	ND	ND - 3	Erosion of natural deposits
* The State Water Resources Control Board considers 50 pCi/L to be the level of concern for beta particles.					^ Alvarado data from 2018. Miramar and Otay data from 2017.								

\* The State Water Resources Control Board considers 50 pCi/L to be the level of concern for beta particles.

^ Alvarado data from 2018, Miramar and Otay data from 2017.

As water travels over the surface of the land or in underground aquifers, it dissolves naturally-occurring minerals and, in some cases, radioactive material. Radioactive materials can be naturally-occurring or a result of oil and gas mining activities. The results in the table above are presented in units of picocuries per

liter (pCi/L), a standard measurement that represents an amount of radiation per liter of water. San Diego's drinking water is substantially lower than the MCL for all radioactive parameters.

MICROBIOLOGICAL	UNITS	MCL	MCLG	DLR	CITY OF SAN DIEGO DISTRIBUTION SYSTEM		MAJOR SOURCES IN DRINKING WATER
					AVERAGE*	RANGE*	
Total Coliform Bacteria State Total Coliform Rule	% Positive	5% Positive	0	n/a	0.1%	0 - 4%	Naturally present in the environment

\*Based on Monthly Percentages of Positive Total Coliform samples

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially-harmful bacteria may be present. DDW regulations require the City to test a minimum of 85 samples per week throughout our distribution system for total coliform bacteria, and to report the results, including the percentage of total coliform positive samples in a given month. To meet this requirement, in 2019 the City of San Diego collected and analyzed 6796 total coliform samples from the distribution system, an average of 131 per week. The MCL for total coliform is defined as the presence of coliform in 5% or more of the samples analyzed in one month, meaning that if 100 samples are collected and 5 contain total coliform, a violation of the MCL has occurred. The regulations are written

as a percentage of monthly samples because multiple variables can cause a positive result, including environmental contamination at the tap. In 2019 the City did not exceed the monthly MCL for total coliform. In fact, this has never occurred in the City's system since this rule was established in 1989. The maximum value recorded in 2019 was 0.4% of monthly samples. When any sample tests positive for total coliform, three additional samples are collected and the cause of the positive result is investigated. Total Coliform Rule testing also examines the presence of *E. coli*, which is a subgroup of Total Coliform. All samples obtained from our drinking water distribution system in 2019 were absent of *E. coli*.

TREATMENT TECHNIQUE	UNITS	MCL	PHG	CITY OF SAN DIEGO TREATMENT PLANTS			PURCHASED TREATED WATER	MAJOR SOURCES IN DRINKING WATER
				ALVARADO	MIRAMAR	OTAY		
Turbidity	NTU	TT = 1 NTU	n/a	Max Level Found = 0.19	Max Level Found = 0.09	Max Level Found = 0.09	Max Level Found = 0.07	Soil runoff
		TT = 95% of samples ≤ 0.3 NTU	n/a	100% of samples ≤ 0.3	100% of samples ≤ 0.3	100% of samples ≤ 0.3	100% of samples ≤ 0.3	

Turbidity is a measure of the cloudiness of the water and is regulated as a Treatment Technique (TT) – an indicator of the effectiveness of our treatment. The City's three water treatment plants (WTPs) monitor turbidity every 15 minutes to ensure consistent, high-quality drinking water production for our customers. TT performance goals established by DDW state that all samples should have turbidity less than 1 NTU, and 95% of the samples should have turbidity less than 0.3 NTU. All three of our treatment plants had 100% of turbidity values less than 0.3 NTU; the maximum values measured in 2019 were 0.19

NTU for Alvarado WTP and 0.09 NTU for both Miramar WTP and Otay WTP. These consistent and very low

turbidity results have led to our treatment plants receiving performance awards. For example:

- The Otay WTP has been awarded the Director's Award from the American Water Works Association (AWWA) Partnership for Safe Water (PSW) Program for twelve consecutive years.
- The Miramar WTP has received the Director's Award for eight years and the President's Award for seven consecutive years.
- Our award-winning Alvarado Treatment Plant participates in the PSW program, meeting all turbidity standards.

## CONTINUED: PRIMARY STANDARDS (MANDATORY HEALTH RELATED STANDARDS)

LEAD AND COPPER STUDY	UNITS	ACTION LEVEL	PHG	DLR	SAMPLES TAKEN FROM CUSTOMER TAPS				Number of Schools Sampled for Lead	MAJOR SOURCES IN DRINKING WATER
					90th PERCENTILE CONCENTRATION	SAMPLING SITES	NUMBER EXCEEDING AL	VIOLATION		
Copper	ppm	1.3	0.3	0.05	0.61	64	0	NO	281*	Internal corrosion of household plumbing systems
Lead	ppb	15	0.2	5	ND	64	1	NO		Internal corrosion of household plumbing systems

Note: Lead and Copper Rule Monitoring mandated every three years. Most recent monitoring conducted in 2017.

In addition to the EPA Lead and Copper study and schools sampling, the City of San Diego analyzed 72 samples from our three drinking water treatment plants in 2019. All results were below the DLR.

\* Represents total number of schools sampled in 2017, 2018, and 2019.

Lead and copper are at Non Detectable levels in the water produced at San Diego's water treatment plants, but can enter drinking water through plumbing materials used in homes or businesses. Exposure to lead and copper may cause health problems ranging from stomach distress to brain damage. In 1991, the EPA published the Lead and Copper Rule (LCR) which, along with corrosion control and other treatment practices, requires monitoring of lead and copper at customer taps. The purpose of the LCR residential sampling is to assess the potential of lead and copper to leach into drinking water from the plumbing installed between the water meter and the tap in homes and businesses. If lead concentrations at customer taps exceed an Action Level (AL) of 15 ppb or copper concentrations exceed an AL of 1.3 ppm in more than 10% of taps sampled, we are required to inform the public and undertake a number of additional actions to ensure comprehensive corrosion control.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of San Diego is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can

take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/lead>.

Lead and Copper Rule monitoring must be conducted every three years. In 2017 sixty-four customers provided samples from their taps to the City of San Diego for lead and copper analysis. None of the residences had a copper result above the AL; just one residence had lead above the AL, representing 1.5% of the residences we tested. Because less than 10% of our results were above the AL for both lead and copper, our water is considered non-corrosive, and no additional actions are required. Our next system-wide study will be conducted in the summer of 2020.

In 2017, DDW issued a Permit Amendment requiring water utilities to sample for lead in the drinking water of any school requesting testing. Additionally, Assembly Bill 746 was signed into law in October 2017, requiring California water providers to conduct lead testing at public K-12 schools within their service area to determine if lead is present in the school's private plumbing or water fixtures. The table lists the total number of schools the Public Utilities Department has tested under these programs. To obtain testing results from individual schools, please contact the school directly or visit the district website.

**Lead<sup>1</sup>**— Consistent with 40 CFR section 141.154(d)(1), every CCR must include the lead-specific language shown below. A water system may provide its own educational statement, but only after consulting with the State Water Board.

## DETECTED DISINFECTION BYPRODUCTS, DISINFECTANT RESIDUAL AND DISINFECTION BY-PRODUCT PRECURSORS

	UNITS	MCL	PHG	DLR	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER		MAJOR SOURCES IN DRINKING WATER
					ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Bromate*	ppb	10	0.1	50/10***	ND	ND - 8.7	ND	ND - ND	n/a	n/a	3.0	ND - 10	Byproduct of drinking water disinfection
Chlorate	ppb	NL=800 PPB		20	n/a	n/a	n/a	n/a	197	131 - 296	143	35 - 450	Byproduct of drinking water disinfection
Chlorite**	ppm	1.0	0.05	0.020	n/a	n/a	n/a	n/a	0.36	0.12 - 0.50	n/a	n/a	Byproduct of drinking water disinfection
Total Organic Carbon (TOC)	ppm	TT	n/a	0.3	2.4	1.9 - 3.4	2.4	2.1 - 3.2	3.7	1.7 - 5.8	2.3****	1.9 - 2.7	Various natural and manmade sources; TOC is a precursor for the formation of disinfection byproducts

\* Required for Alvarado, Miramar, and Purchased Treated Water; compliance is determined by the quarterly Running Annual Average (RAA)

\*\* Required for Otay \*\*\*City of San Diego DLR=5, Purchased Treated Water DLR=1

\*\*\*\*Highest Running Annual Average

	UNITS	MCL [MRDL]	PHG [MRDLG]	DLR (MDL)	CITY OF SAN DIEGO DISTRIBUTION SYSTEM			MAJOR SOURCES IN DRINKING WATER
Disinfectant Residual (Chloramines as Cl <sub>2</sub> )	ppm	[4.0] <sup>a</sup>	[4]	(0.1)	Distribution system average = 1.8	Range = ND - 3.6	—	Drinking water disinfectant added for treatment
Chlorite <sup>a</sup>	ppm	1.0	0.05	0.020	Distribution system average = 0.27	Range = ND - 0.45	----	Byproduct of drinking water disinfection
Haloacetic Acids (HAA5)	ppb	60 <sup>c</sup>	n/a	----	Maximum LRAA = 13	Range = ND - 19	Violation - NO	Byproduct of drinking water disinfection
Total Trihalomethanes (TTHMs)	ppb	80 <sup>c</sup>	n/a	—	Maximum LRAA = 43	Range = 5.7 - 68	Violation - NO	Byproduct of drinking water chlorination

<sup>a</sup> Chlorite monitoring required only in the Southern section of the distribution system.

<sup>b</sup> Compliance is determined by the distribution system average.

<sup>c</sup> Total Trihalomethane and HAA5 compliance is based on quarterly Locational Running Annual Averages (LRAA)

Drinking water must be disinfected to ensure that any potentially harmful microbes are neutralized. There are a variety of disinfection strategies used throughout the United States. San Diego utilizes some of the more advanced disinfection technologies available. Our Alvarado and Miramar treatment plants use ozone and chloramines for disinfection. Ozone produces fewer disinfection byproducts than chlorine or chloramines alone and is considered a superior disinfection method. However, all disinfectant strategies have the potential to create a byproduct. When ozone is used, bromate is monitored as a disinfection byproduct. The City's Otay WTP uses chlorine dioxide and chloramines for disinfection. When chlorine dioxide is used, chlorite is monitored as a disinfection byproduct in the plant effluent and distribution system. All 2019 results for bromate and chlorite are below the MCLs. Total Organic Carbon (TOC) has no health effects. It is monitored and reported here because it provides an assessment of potential disinfection byproduct formation.

As drinking water travels from the City's WTPs through the distribution system to homes and businesses, a disinfectant residual must be maintained in order to prevent growth of potentially harmful microbes.

In San Diego, chloramines are used for this purpose. The City performs frequent and comprehensive monitoring to ensure that disinfectant levels remain in the proper range throughout our large and complex distribution system. The Maximum Residual Disinfectant Level (MRDL) is 4.0 ppm. In 2019 the City analyzed 7623 samples for chloramines throughout the distribution system; the average residual was 1.8 ppm and the maximum was 3.6 ppm.

Another category of disinfection byproducts that the EPA and DDW regulate are Total Trihalomethanes (THMs) and Haloacetic Acids (HAA5). Compliance with EPA's Stage 2 Disinfection Byproduct (DBP) rule is based on the running annual average at each location monitored in the distribution system. The MCL for THMs is an LRAA of 80 ppb, and the MCL for HAA5 is an LRAA of 60 ppb. The City has had no violations of the EPA Stage 1 and Stage 2 DBP MCLs since the program was formalized in 2002. In 2019, our highest LRAA for TTHM was 43 ppb, and individual measurements ranged from 5.7 to 68 ppb. For HAA5, our highest LRAA was 13 ppb, and individual measurements ranged from ND to 19 ppb.

<sup>1</sup> All water systems are required to comply with the state Lead and Copper Rule (LCR). Water systems are also required to comply with the federal LCR, and its revisions and corrections. The 2007 Short-term Revisions of the LCR included mandatory language requirements that have not yet been adopted by the State Water Board.



## SECONDARY STANDARDS (AESTHETICS STANDARDS)

	UNITS	CA SMCL	DLR (MDL)	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER		MAJOR SOURCES IN DRINKING WATER
				ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
				AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Aluminum	ppb	200	50	ND	ND - ND	ND	ND - ND	ND	ND - ND	ND	ND - 94	Erosion of natural deposits; residue from some surface water treatment processes
Chloride	ppm	500	(0.5)	93.5	74.1 - 111	86.7	69.9 - 107	146	114 - 186	75.7	65.7 - 94.0	Runoff/leaching from natural deposits; seawater influence
Color	CU	15	(1)	ND	ND - 1	ND	ND - 2	1	ND - 3	ND	ND - 2	Naturally - occurring organic materials
Odor - Threshold	OU	3	1	ND	ND - 1	ND	ND - 1	1	ND - 1	1	ND - 1	Naturally - occurring organic materials
Specific Conductance	µS/cm	1,600	n/a	731	547 - 914	672	519 - 832	858	694 - 1020	539	345 - 644	Substances that form ions when in water; seawater influence
Sulfate	ppm	500	0.5	127	73.7 - 200	115	68.5 - 184	106	79.9 - 154	66.7	10.0 - 108	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids	ppm	1000	(10)	450	314 - 584	404	300 - 522	517	423 - 616	302	147 - 379	Runoff/leaching from natural deposits

Secondary standards (Secondary MCLs) are set to protect the odor, taste, and appearance of drinking water. If present at or above the Secondary MCL, these parameters may cause the water to appear cloudy or colored, or to have a different or unusual taste or odor. These parameters are not considered to present

a risk to human health at or above Secondary MCL levels. All measurements of Secondary Standards were below the Secondary MCL in 2019.

## OTHER PARAMETERS THAT MAY BE OF INTEREST

	UNITS	MCL	PHG	MDL	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER	
					ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE		
Sodium	ppm	n/a	n/a	20	79.0	61.3 - 95.1	71.1	59.0 - 86.2	102	82.3 - 122	63.9	47.8 - 77.8
Total Hardness	ppm	n/a	n/a	10	194	141 - 261	174	135 - 244	194	165 - 238	113	39.0 - 164
Total Hardness	gr/Gal	n/a	n/a	0.6	11.3	8.24 - 15.2	10.2	7.88 - 14.3	11.3	9.64 - 13.9	6.62	2.28 - 9.58
Alkalinity - Total as CaCO <sub>3</sub>	ppm	n/a	n/a	20	109	84.9 - 133	99.1	82.4 - 124	116	93.3 - 145	78.0	37.0 - 87.0
pH	pH	n/a	n/a	n/a	8.03	7.63 - 8.32	8.04	7.28 - 8.38	8.02	6.90 - 8.35	8.26	6.00 - 8.68

Water quality parameters that may be of interest to our consumers, but do not have MCLs or PHGs and are not considered to present a risk to human health, are included in the table above. Although sodium and hardness do not have MCLs, they are of interest to many consumers who are concerned about sodium intake and may believe that the hardness of the water could affect their health. Therefore, monitoring and

reporting are required by DDW. Sodium refers to the salt present in the water and is generally naturally occurring. Hardness is the sum of positively-charged mineral ions present in the water, essentially the sum of magnesium and calcium. These minerals are usually naturally occurring. Alkalinity and pH are included here because they have proven to be of interest to our customers.

## DETECTED UNREGULATED PARAMETERS

	UNITS	NOTIFICATION LEVEL	DLR (PHG)	CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED TREATED WATER	
				ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE
				AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE		
Boron	ppm	1	0.1	0.1	0.1 - 0.1	0.1	0.1 - 0.1	0.2	0.1 - 0.2	0.3	0.1 - 0.7
N-Nitrosodimethylamine (NDMA)	ppt	10	(3)	n/a	n/a	n/a	n/a	n/a	n/a	3	2 - 4
Chromium, hexavalent (CrVI)	ppb	—	(0.02)*	0.07	Single Sample	0.04	Single Sample	0.03	Single Sample	0.14	ND - 0.49

\* The DLR of 1 ppb and the MCL of 10 ppb for Chromium VI were repealed in 2017. The value listed here is the PHG for Chromium VI.

## UCMR4 STUDY

UCMR4 PARAMETERS <sup>1</sup>	UNITS	UCMR4 MRL (MDL)	CITY OF SAN DIEGO TREATMENT PLANTS						CITY OF SAN DIEGO DISTRIBUTION SYSTEM	
			ALVARADO		MIRAMAR		OTAY		MAX LRAA	RANGE
			AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE		
Bromide*	ppm	(0.02)	0.10	0.05 - 0.16	0.06	0.04 - 0.11	0.20	0.04 - 0.35	n/a	n/a
Manganese	ppb	0.4	2.2	ND - 8.2	0.9	0.6 - 1.2	0.2	ND - 0.7	n/a	n/a
Total Organic Carbon (TOC)*	ppm	(1)	3.2	2.7 - 3.7	2.7	2.6 - 2.9	4.9	2.6 - 7.0	n/a	n/a
HAA9**	ppb	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	4.1 - 40

<sup>1</sup> UCMR4 samples were collected in 2018

\* As measured in untreated plant influent

\*\* HAA9 is the sum of bromochloroacetic acid, bromodichloroacetic acid, chlorodibromochloroacetic acid, dibromochloroacetic acid, dichloroacetic acid, monobromochloroacetic acid, monochloroacetic acid, tribromochloroacetic acid, and trichloroacetic acid.

The parameters listed in the Detected Unregulated Parameters section are not regulated by DDW or the EPA, and monitoring is not required. Unregulated contaminant monitoring helps U.S. EPA and the State Water Resources Control Board to determine where certain contaminants occur and whether the contaminants need to be regulated. Boron and N-Nitrosodimethylamine (NDMA) have been issued Notification Levels (NL) by DDW. If detected above the NL, customers must be notified of the presence of these parameters. The results presented here are significantly lower than the NL. Hexavalent Chromium (CrVI) was issued an MCL of 10 ppb and a DLR of 1 ppb by DDW in 2014. However, these were withdrawn in 2017. The values presented here are approximately 100 times less than 10 ppb.

As part of the 1996 Safe Drinking Water Act (SDWA) amendments, every five years EPA selects from the Contaminant Candidate List (CCL) up to 30 unregulated contaminants to be monitored by public water systems as part of

the Unregulated Contaminant Monitoring Rule (UCMR) program. The CCL is a list of contaminants that are not regulated but are known or anticipated to occur in public water systems, and may warrant future regulation under the Safe Drinking Water Act. The results of UCMR studies provide a basis for future regulatory actions to protect public health. The City of San Diego conducted UCMR4 sampling in 2018.

San Diego's drinking water was tested by an EPA-approved contract laboratory in 2018 for 30 UCMR4 unregulated contaminants. This included 10 different cyanotoxins, none of which were detected. Twenty additional chemicals were monitored, including metals, pesticides, and alcohols. Of these 32 parameters, two were detected – manganese and HAA9. Additionally, two indicators of water quality were monitored in untreated water – bromide and Total Organic Carbon (TOC).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of San Diego Public Utilities Department is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you do so, you may wish to collect the flushed water and reuse it for another beneficial purpose, such as watering plants. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at [www.epa.gov/lead](http://www.epa.gov/lead).



**Quality • Value**  
**Reliability • Customer Service**

# The City of **SAN DIEGO**

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

## Spanish

Este informe contiene información muy importante sobre su agua potable.  
Tradúzcalo o hable con alguien que lo entienda bien.

## Arabic

”هذا التقرير يحتوي على معلومات مهمة تتعلق بمياه الشفة (أو الشرب).  
ترجم التقرير، أو تكلم مع شخص يستطيع أن يفهم التقرير.“

## Chinese (Traditional)

此份有關你的食水報告，內有重要資料和訊息，請找  
他人為你翻譯及解釋清楚。

## Chinese (Simplified)

此份有关你的食水报告，内有重要资料和讯息，请找  
他人為你翻譯及解釋清楚。

## Farsi

اهل اطلاعات مهمی راجع به آب آشامیدنی است. اگر نمیتوانید این اطلاعات را به زبان انگلیسی  
این اطلاعات به

بخوانید لطفاً از کسی که میتواند یا ری بگیرد تا مطالب را برای شما به فارسی ترجمه کند.

## French

Cé rapport contient des information importantes concernant votre eau potable.  
Veuillez traduire, ou parlez avec quelqu' un qui peut le comprendre.

## Hmong

Daimntawv tshaj tawm no muaj lus tseemceeb txog koj cov dej haus.  
Tshab txhais nws, los yog tham nrog tej tug neeg uas totaub txog nws.

## Japanese

この情報は重要です。  
翻訳を依頼してください。

## Korean

이 안내는 매우 중요합니다.  
본인을 위해 번역인을 사용하십시오.

## Laotian

ລາຍງານນີ້ມີຂໍ້ມູນສຳຄັນກ່ຽວກັບນ້ຳປະປາຂອງທ່ານ. ຈົ່ງໃຫ້ຄົນອື່ນຮູ້ປະລາວມໃຫ້ທ່ານ,  
ຫລືໃຫ້ປຶກສາກັບຄົນໃດຄົນໜຶ່ງທີ່ເຂົາເຈົ້າເຂົ້າໃຈເລື້ອງ.

## Russian

Этот отчет содержит важную информацию о вашей питьевой воды. Переведите  
его или поговорите с тем, кто это понимает.

## Swahili

Shauri hii niya kufahamisha uzuri wa maji ya kunyua.  
Shauri nilazima egeuzwe kwa yoyote hajui Kiingereza.

## Tagalog

Mahalaga ang impormasyong ito. Mangyaring ipasalin ito.

## Vietnamese

Chi tiết này thật quan trọng.  
Xin nhờ người dịch cho quý vị.

## Khamer

របាយការណ៍នេះមានព័ត៌មានសំខាន់  
នៃអំពីទឹកបរិភោគ ។ សូមបកប្រែ  
ឬពិគ្រោះជាមួយអ្នកដែលចេះភាសា  
របាយការណ៍នេះ ។