Annual Drinking Water Quality Report

Quality • Value • Reliability

Customer Service



























City of San Diego's Tap Water Continues to Meet Health Standards in 2017

The U.S. Environmental Protection Agency (EPA) and the California Division of Drinking Water require all water agencies to produce an annual report on the previous year informing customers about the quality of their drinking water. The annual Drinking Water Quality Report includes details about the origin of the City water supply, what it contains and how it compares to state standards.

Based on water quality monitoring data collected in 2017, the City 's tap water met all state and federal drinking water health standards, which are the primary standards for treating and monitoring water.

A Message from the Director

I am pleased to share the 2017 Drinking Water Quality Report. As your water purveyor, our priority is to provide safe, reliable drinking water for our 1.4 million customers. We have been honored to do so for more than 100 years.

Delivering safe drinking water to our customers is a job we take very seriously. Water quality personnel test water for several hundred chemical compounds at multiple points in the distribution system, as well as in our treatment plants, watersheds and reservoirs. All of our tests are closely monitored by local, state and federal authorities and the results are reported to the public and the state. Every year we conduct approximately 300,000 tests to ensure the water we deliver meets or exceeds regulatory water quality standards.

A reliable water supply is critical to the economic vitality and excellent quality of life we experience in San Diego now and for future generations. To ensure the continuity of supply, Phase 1 of Pure Water San Diego is currently being implemented. It will create a safe, reliable local source of purified water that has been endorsed by residents, the business community, environmental groups and water professional organizations.

The City of San Diego Public Utilities Department is committed to continuously delivering high quality drinking water to the entire city at the lowest possible cost. From monitoring the watersheds and testing on a daily basis to treatment and delivery, the City ensures a safe reliable water supply for future generations.

Sincerely,

Vic Bianes Director of Public Utilities

69) CONTACT

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General and Billing Information	
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	customercare@sandlego.gov
Water Quality Lab	
	drinkingwaterguality@candiego.gov
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Capital Improvements Projects	
City Lakes Recreation	619-465-3474
Pure Water Speakers Bureau	
Storm Water Pollution Prevention	619-235-1000
Water Waste/Recycled Water	
	waterwaste@sandiego.gov

VISIT

City of San Diego Public Utilities	sandiego.gov/publicutilities
San Diego County Water Authority	sdcwa.org
Metropolitan Water District	mwdh2o.com
CA 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



youtube.com/TheCityofSanDiego

How Can I Get More Involved?

Public Utilities Department issues 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. For meeting location, date, time and items involving the Public Utilities Department, visit sandiego.gov/city-clerk/officialdocs/legisdocs/dockets for the current Council agenda. CityTV also streams council meetings online at **sandiego.gov.**





WATER SUPPLY

WHAT'S IN MY 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 tap water is safe to drink, the U.S. Environmental Protection Agency 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 (FDA) regulations and California law also establish limits for contaminants in bottled water that provide the same protection for public health.

IMPORTED WATER SUPPLY AND THE IMPACT ON WATER QUALITY

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

The majority of imported water from the Water Authority is a blend from the Colorado River and State Water Project (see map below). Throughout the year, the ratio of water from each source changes. Several forces potentially impact the quality of water from the Colorado River and State Water Project. The Colorado River winds through thousands of miles of unprotected watershed containing towns, farms, old mining sites and industrial sites. Water from the State Water Project is subject to potential contaminants such as pesticides and herbicides. This water source also has a higher organic carbon and bromide level than the Colorado River water. As organic carbon and bromide levels increase, the potential for creating higher levels of disinfection byproducts exists. The City continually alters its treatment process to adjust for changing water supplies.



SAN VICENTE RESERVOIR

The City of San Diego's San Vicente Reservoir, located in East County, is an important component of the City's and the region's water supply. The capacity of the reservoir was nearly doubled after the San Diego County Water Authority completed the new dam and enhancements in 2016. The enhancements to the marina include a boat dock and launch ramp, a comfort station and a concessions area. The reservoir offers recreational opportunities, such as boating, water sports, fishing, picnicking and a rental boat fleet.





San Vicente by the Numbers







SAN DIEGO'S HIDDEN GEW





Pure Water San Diego is a phased, multi-year program that will use water purification technology to clean

program that will use water purification te recycled water to produce a safe, reliable and sustainable drinking water supply. The Pure Water Program will provide one-third of the City of San Diego's water supply locally by 2035. The Pure Water Program will include a system of treatment facilities, pump stations and pipelines that will be constructed in multiple phases.

Total: 83 million gallons per day (MGD)

Phase 1 – North City Projects



Phase 1 of the Pure Water Program is composed of several projects that will produce 30 million gallons per day of purified water by 2021, reducing the City's dependence on imported water. The new Morena Pump Station and Pipelines will transport wastewater to an expanded North City Water Reclamation Plant. A new Pure Water Facility will treat recycled water using the proven five-step water purification process to produce purified water that will be delivered to Miramar Reservoir via the new North City Pure Water Pump Station and Pipeline. The purified water will blend with imported water supplies and be treated at the existing Miramar Drinking Water Treatment Plant before being distributed to the public.

- The San Diego City Council unanimously voted to certify the Pure Water San Diego North City Project Final Environmental Impact Report/Environmental Impact Statement and approved the Phase 1 construction management contracts.
- Construction on Phase 1 pipelines and facilities will take place between 2019 and 2021.



Standing Strong, Ten Years On -Water Rates Help Fund Infrastructure Improvements

The City's ability to deliver water to its customers depends on having safe and reliable water infrastructure. Replacing aging components in the drinking water distribution system is essential to maintaining good water quality.

When water rates were increased between 2007-2010, the boost in funding helped to pay for a wide range of water infrastructure improvements under the City's Capital Improvements Program (CIP). Some of the CIP projects funded with the increase included:

------ Alvarado Water Treatment Plant Upgrades

The Alvarado Water Treatment Plant, which has a capacity of 120 million gallons, provides water to customers in the central areas of the city. A multi-phase expansion and upgrade project for the plant was completed in 2011 and included an ozone contactor and associated equipment, the rehabilitation of the original sedimentation and flocculation basins and a 1.1-megawatt solar power system.



...... Rancho Bernardo Reservoir Rehabilitation Project

Originally constructed in 1964, the Rancho Bernardo Reservoir is a 370-foot by 298-foot drinking water storage reservoir with a capacity of 10 million gallons. From 2008-2009, the reservoir received a complete overhaul, including seismic retrofitting, corrosion control, site security upgrades and various mechanical upgrades to improve operations at the facility. The improvements extended the service life of the reservoir, and increased the reliability of local water supplies.



• Otay Water Treatment Plant Upgrades

The smallest of the City's three water treatment plants, Otay Water Treatment Plant's capacity is 34 million gallons of treated drinking water per day. In 2010, the City completed an expansion and upgrade project for the plant that included an 804 kilowatt (AC) solar power system.



To view the full list of CIP projects that were funded by the 2007-2010 water rate increases, visit www.sandiego.gov/water/cip/list.

A CHANGE FOR THE BETTER...



PREVENT POLLUTION

One of the best ways to prevent the flow of pollution into our local waterways is to prevent water from leaving your property as you perform daily activities. Eliminate over-irrigation by sweeping hard surfaces instead of using running water.

AROUND YOUR HOME

Sweep up trash, dirt and debris and dispose of in the trash. Reduce bacteria in our waterways by picking up litter from around your yard and neighborhood and carry bags to pick up after your pet.

IN YOUR YARD

Yard waste has the potential to carry hazardous landscaping chemicals such as pesticides, herbicides and fertilizers into the storm drain system. It also generates a large amount of bacteria if left to decompose in gutters, catch basins and local waterways.

Sweep up yard waste instead of hosing it away and keep curb gutters free of leaves and grass clippings. Replace lawns with native plants to conserve water and reduce the need for landscape chemicals. Stop irrigation runoff by adjusting sprinklers and reducing watering times.

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, antifreeze, transmission fluids and heavy metals. It is important to check your vehicle regularly for fluid leaks and keep it serviced. Use a funnel to prevent spills and keep rags and absorbents within reach. Use drip pans, drop cloths or containers to collect fluids when making repairs or collecting leaks. Wash your car on your lawn or direct wash water to a landscaped surface to avoid releasing automotive pollution into our waterways.

BEGINS

WITH

YOU.

Make a pledge to implement the above practices daily. Think Blue appreciates everything you do to help protect our local waterways.

KEEP POLLUTANTS OUT OF STORM DRAINS

Many people think that when water flows into a storm drain it is treated, but the storm drain system and the sanitary sewer system are not connected. Everything that enters storm drains flows untreated directly into our creeks, rivers, bays, beaches and ultimately the ocean. Storm water often contains pollutants, including chemicals, trash and automobile fluids, all of which pollute our beaches and harm fish and wildlife.

To report storm water pollution in San Diego, call the Think Blue Hotline 619-235-1000 or report it at sandiego.gov/getitdone.







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. 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.

THE WATER TREATMENT PROCESSES WE USE ARE:

Watershed protection: Protecting the watersheds prevents contamination of our water supply and is the most cost effective process in water treatment. Extensive measures are being 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 2015 Watershed Sanitary Survey, which contains information on the City's watersheds, is available at: https://www.sandiego.gov/water/ quality/environment/sanitarysurvey.

Coagulation: This is the chemical process of rapidly mixing coagulants to 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 is allowed to slowly flow through the sedimentation basins. The floc settles to the bottom and is removed. The clear water is collected from the top of the sedimentation basins and sent to the filters.

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.

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.

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.



Sustainability

The City of San Diego has long led the way in sustainable water and energy practices. From the installation of a recycled water distribution system to the self-generation of electricity and heat at wastewater treatment plants, to the incorporation of desalinated water into the drinking water portfolio. San Diego has been working hard to manage water demands while also supporting a sustainable future.

Continuing on that path of discovery, the City is creating a new district where commercial buildings pledge to create more sustainable work spaces. Adopted in 2017, the "2030 district" is a high-performance building community that aims to achieve a 50 percent reduction in water, energy and transportation emissions in participating buildings by 2030.

The City is a partner on this project and maintains a position on the leadership council in collaboration with Cleantech San Diego,



Measurabl, DNV GL, Alexandria Real Estate Equities, Urban Land Institute Greenprint Center for Building Performance, Intuit, Kilroy Realty and local business leaders. Energy and water efficient buildings help the City of San Diego reach its Climate Action Plan goal to eliminate half of all greenhouse gas emissions in the City by 2035.







Ocean Monitoring

The Public Utilities Department's Ocean Monitoring Program is the pre-eminent leader in studying the effects of regional treatment processes on marine communities. Over 200 days of sampling typically occur annually along San Diego's beaches and offshore environments. Offshore sampling is accomplished using the Public Utilities' two monitoring vessels, the *Oceanus* and *Monitor III*.

Marine biologists use specialized sampling gear and instruments to collect the wide array of information necessary to define the ecological health of the ocean environment and to identify potential health concerns associated with the recreational use of San Diego's coastline.

Each year, the Ocean Monitoring Program holds an open house to allow the public to see what staff members do first-hand. This year nearly 500 people turned out to see the process the program uses to monitor the ocean.



Notice of Violation

dichloroethane

chlorohydrin

oride

CICHO

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NO.

The state Division of Drinking Water (DDW) notified us that we did not monitor nitrate annually at the El Cajon Well in 2017 and annually in years of active use at the El Capitan Well in 2013, 2014 and 2017. In addition, the oversight extended to the monitoring of nitrite every three years at the El Capitan Well in 2013 and 2016. There was no risk to public health as a result of this violation.

We are required to monitor drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. The City of San Diego operates an extensive monitoring program for our source waters, treatment plants and distribution system. We are proud to state that we have never detected a contaminant in our drinking water at levels above state or federal limits.

San Diego uses a number of different sources of water to ensure we have a robust and drought-resistant water supply. Water from these two wells is blended with local surface water sources and is treated at the Alvarado Water Treatment Plant (WTP). A map that shows the service area of each of our treatment plants is located on page 2 of this report. The El Cajon Well represents about 0.6 percent of the total flow entering Alvarado WTP, and the El Capitan Well represents about 0.05 percent. We monitored the influent to Alvarado WTP, as well as Alvarado treated water, for both nitrate (NO₃) and nitrite (NO₂) on a weekly basis in 2017.

The maximum value for nitrate (as N) in our plant influent was 0.51 mg/L and the annual average was 0.25 mg/L, far below the Maximum Contaminant Level (MCL) of 10 mg/L. The maximum value for nitrate (as N) in our treated water, as can be seen in the data tables in this report, was 0.4 mg/L. Nitrite was not detected above the Detection Limit for Reporting (DLR) in Alvarado WTP influent or treated water in 2017. Both wells have been monitored for nitrate and nitrite in 2018 and all results meet drinking water standards. As our customers, you have a right to know what happened and what we did to correct the situation. Again, there was no risk to public health as a result of this violation.

IMPORTANT HEALTH INFORMATION



Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons and some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. Environmental Protection Agency/Centers for Disease Control 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). During calendar year 2017, the water supply to each of the City's water treatment plants was monitored for *Cryptosporidium* and *Giardia*, and neither was detected.

Drinking water, including bottled water, may reasonably be expected to contain 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 (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**.

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 – December 2017. The tables list all parameters that were detected at or above DDW's Detection Limit for Purposes of Reporting. The map on page 2 of this report can be used to determine the treatment plant or plants that supply water to your residence. Purchased treated water, which is a blend of water treated at the MWD Skinner Water Treatment Plant, the Water Authority Twin Oaks Water Treatment Plant and the Carlsbad Desalination Plant, represents less than 10 percent of total water use.

DEFINITION OF TERMS

Action Level (AL): The concentration of a contaminant that, 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 Average are calculated quarterly using 12 months of data and may include values obtained in 2015.

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 EPA.

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 DDW 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 below which there is no known or expected health risk. Public Health Goals are set by the California EPA.

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

ABBREVIATIONS

A: absent

CA SMCL: California Secondary Maximum Contaminant Level

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

CU: Color Units

DLR: Detection Limit for Reporting

gr/Gal: grains per gallon

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 (μ g/L) – [1 ppb = 0.001 ppm]

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

TT (treatment technique): a required process intended to reduce the level of a contaminant in drinking water

µS/CM: micro-siemens/centimeter

- < less than
- > greater than

ENVIRONMENTAL MONITORING AND TECHNICAL SERVICES CONSUMER CONFIDENCE REPORT DATA - 2017

PRIMARY STANDARDS (MANDATORY HEALTH RELATED STANDARDS)														
						CITY OF SAN DIEGO TREATMENT PLANTS						IASED		
					ALVARADO		MIRA	MIRAMAR		TAY	TREATED WATER		MAJOR SOURCES	
CHEMICAL PARAMETERS	UNITS	MCL	PHG	DLR	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	IN DRINKING WATER	
Arsenic	ppb	10	0.004	2	ND	ND - ND	ND	ND - ND	ND	ND - ND	ND	ND - 2	Erosion of natural deposits; glass and electronics production waste	
Barium	ppm	1	2	0.1	ND	ND - 0.10	ND	ND - 0.11	ND	ND - 0.10	ND	ND - ND	Erosion of natural deposits	
Fluoride (naturally occurring)	ppm	2	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	1	0.1	0.6	0.5 - 0.7	0.6	0.5 - 0.7	0.5	0.3 - 0.6	0.7	0.5 - 1.1	Water additive that promotes strong teeth	
Nitrate (as N)	ppm	10	10	0.4	ND	ND - 0.4	ND	ND - 0.4	ND	ND - 0.9	ND	ND - 0.6	Runoff and leaching from fertilizer use; erosion of natural deposits	
Nitrate (as N)	ppm	10	10	0.4	ND	ND - 0.4	ND	ND - 0.4	ND	ND - 0.9	ND	ND - 0.6	fertilizer use; erosion of natural deposits	

Note: Optimal Fluoride Level as established by US Dept. of Health and Human Services and California Waterboards Division of Drinking Water is 0.7 ppm.

Primarystandards (MCLs) are developed for the purpose of protecting the public from possible health risks associated with long-term exposure to contaminants. In general, no health hazard is expected to exist when contaminant levels are below a Primary MCL.

California state law requires water agencies with more than 10,000 water service connections to supplement naturallyoccurring fluoride in their drinking water. Our water system complies with this requirement to help prevent dental cavities in consumers. For more information, visit http://www.sandiego.gov/water/quality/fluoridation.shtml. In 2017, the City of San Diego's source waters contained naturally-occurring fluoride between 0.1 and 0.8 ppm. State regulations require fluoride in treated water to be maintained at an optimum dose of 0.7 ppm. In 2017 treated water had fluoride concentrations ranging from 0.3 to 1.1 ppm, with average values of 0.5 to 0.7 ppm. Information about fluoridation, oral health, and current issues is available at https://www.cdc.gov/fluoridation/index.html.

Some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage

or circulatory system problems, and may have an increased risk of getting cancer. The main source in San Diego's drinking-water is arsenic-containing rocks through which the water has filtered. It may also occur because of mining or industrial activity in some areas. Arsenic was detected in small amounts, with a maximum of 2 ppb, in San Diego's imported treated water. This value is five times less than the MCL, which is 10 ppb.

Infants below the age of 6 months who drink water containing nitrate in excess of the MCL may quickly become seriously ill and, if untreated, may die because high nitrate levels can interfere with the capacity of the infant's blood to carry oxygen. High nitrate levels may also affect the oxygen-carrying ability of the blood of pregnant women. San Diego monitors for nitrate in our treatment plant source water and treated drinking water, as well as dozens of sites in our distribution system, on a weekly basis. In 2017, the vast majority of our treated drinking water results were ND for nitrate. The maximum value found in our treatment plant was 0.9 ppm, more than 10 times less than the MCL of 10 ppm.

						CITY OF SAN DIEGO TREATMENT PLANTS							
			PHG		ALVAR	ADO	MIRAMAR^		OT/	OTAY^		WATER	MAIOR SOURCES
RADIOACTIVE PARAMETERS	UNITS	MCL	(MCLG)	DLR	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	IN DRINKING WATER
Gross Alpha Particle Activity	pCi/L	15	(0)	3	ND	n/a	ND	n/a	6.0	n/a	ND	ND - 7	Erosion of natural deposits
Gross Beta Particle Activity	pCi/L	50*	(0)	4	4.6	n/a	ND	n/a	4.1	n/a	ND	ND - 6	Decay of natural and manmade deposits
Radium 226	pCi/L	г**	0.05	1	ND	n/a	ND	n/a	ND	n/a	ND	ND - 1	Erosion of natural deposits
Radium 228	pCi/L	С	0.019	1	1.4	n/a	ND	n/a	ND	n/a	ND	ND - ND	Erosion of natural deposit
Uranium	pCi/L	20	0.43	1	1.2	n/a	1.0	n/a	ND	n/a	1.0	ND - 3.1	Erosion of natural deposit

** Combined Radium-226 & 228 MCL

* DDW considers 50 pCi/L to be the level of concern for beta particles.

As water travels over the surface of the land or under ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material. Radioactive materials can be naturally-occurring near the earth's surface or brought to the surface as 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 is not required to test for Radium 226 and Radium 228; in 2017 we did so to ensure our customers have a complete picture of San Diego's water quality. San Diego's drinking water is substantially lower than the MCL for all radioactive parameters.

^Monitoring required every three years (All data from 2017)

					CITY OF SAN DIEGO	MAJOR SOURCES IN					
MICROBIOLOGICAL	UNITS	MCL	PHG	DLR	AVERAGE	RANGE*	DRINKING WATER				
Total Coliform Bacteria State Total Coliform Rule	/100ml	5% Positive	0	n/a	0.2%	0 - 1.1%	Naturally present in the environment				
*Decad on Monthly December of Decitive Table Caliform complex											

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 2017 the City of San Diego collected and analyzed 6,735 total coliform samples from the distribution system, an average of 130 per week. The test also examines the presence of *E. coli*, which is a subgroup of Total Coliform. The MCL for total coliform is the presence of coliform in 5 percent or more of the samples analyzed in one month, meaning that

if 100 samples are collected in March and five 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 localized contamination at the tap. In 2017 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 2017 was 1.1 percent 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. All samples obtained from our distribution system in 2017 were absent of *E*. coli.

				CITY	OF SAN DIEGO TREATMENT PL	PURCHASED	MAJOR SOURCES IN		
TURBIDITY	UNITS	MCL	PHG	ALVARADO	MIRAMAR	OTAY	TREATED WATER	DRINKING WATER	
Turbidity	NTU	TT = 1 NTU	n/a	Max Level Found = 0.26	Max Level Found = 0.18	Max Level Found = 0.14	Max Level Found = 0.3	Soil runoff	
Turbidity	NTU	$\begin{array}{l} \text{TT} = 95\% \\ \text{of samples} \\ \leq 0.3 \text{ NTU} \end{array}$	n/a	100% of samples ≤ 0.3	100% of samples \leq 0.3	100% of samples ≤ 0.3	n/a	Soil runoff	

Turbidity is a measure of the cloudiness of the water and is a good indicator of the effectiveness of our filtration systems. The City's three water treatment plants monitor turbidity every 15 minutes to ensure consistent, high-quality drinking water production for our customers. Treatment Technique (TT) performance goals established by DDW state that all samples should have turbidity less than 1 NTU, and 95 percent of the samples should have turbidity less than 0.3 NTU. All three of our treatment plants had 100 percent of turbidity values less than 0.3 NTU; the maximum values measured in 2017 were 0.26 NTU for Alvarado WTP, 0.18 NTU for Miramar WTP, and 0.14 NTU for Otay WTP. These consistent and very low turbidity results have led to our treatment plants receiving performance awards. For example:

- The Otay Water Treatment Plant (WTP) has been awarded the Director's Award from the American Water Works Association (AWWA) Partnership for Safe Water (PSW) Program for 10 consecutive years.
- The Miramar WTP has received the Director's Award for six years and the President's Award for five consecutive years.
- Our award-winning Alvarado Treatment Plant participates in the PSW program, meeting all turbidity standards.

CONTINUED:	CONTINUED: PRIMARY STANDARDS (MANDATORY HEALTH RELATED STANDARDS)															
					SAI	MPLES TAKEN FROM										
LEAD AND COPPER STUDY	UNITS	ACTION LEVEL	PHG	DLR	90th PERCENTILE CONCENTRATION	SAMPLING SITES	NUMBER EXCEEDING AL	VIOLATION	Schools Sampled for Lead	MAJOR SOURCES IN DRINKING WATER						
Copper	ppm	1.3	0.3	0.05	0.61	64	0	NO	254	Internal corrosion of household plumbing systems						
Lead	ppb	15	0.2	5	ND	ND 64 1 NO 254 Internal corrosion of household plumbing s										
Natas Land and Commo	- Dula Man	واو مرود مرود مروا	4 a al a a a		ant an exact an exitentian and all	te d in 2017										

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 68 samples from our three drinking water treatment plants in 2017. All results were below the DLR.

Lead and copper are at Non Detectable levels in the drinking water we produce, 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 is to assess the potential of lead and copper to leach into drinking water in homes and businesses from the plumbing installed between the water meter and the tap. 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 percent 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 two 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, 64 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 percent of the residences we tested. Because less than 10 percent 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 2020.

DETECTED DISINFECTIO	DETECTED DISINFECTION BYPRODUCTS, DISINFECTANT RESIDUAL AND DISINFECTION BYPRODUCT PRECURSORS													
						CITY O	F SAN DIEGO	TREATMEN	T PLANTS		PURC	HASED		
					ALVA	RADO	MIRAMAR		OTAY		TREATED WATER		MAJOR SOURCES IN	
	UNITS	MCL	PHG	DLR	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	DRINKING WATER	
Bromate*	ppb	10	0.1	5	ND	ND - 10***	ND	ND - ND	n/a	n/a	5.1	ND - 13***	Byproduct of drinking water disinfection	
Chlorate**	ppb	NL=8	00 PPB	20	n/a	n/a	n/a	n/a	242	ND - 393	134	23 - 360	Byproduct of drinking water disinfection	
Chlorite**	ppm	1.0	0.05	0.02	n/a	n/a	n/a	n/a	0.45	ND - 1.0	n/a	n/a	Byproduct of drinking water disinfection	
Total Organic Carbon [TOC]	ppm	Π	n/a	0.3	2.8	1.9 - 5.0	2.5	2.2 - 3.0	4.6	2.0 - 6.7	1.6	ND - 3.1	Various natural and man made sources	
*Dequired for Alvarade, Miramar, and Durchased Treated Water **Dequired for Otay *** Compliance is determined by the quartery Durples Approach (DAA)														

	UNITS	MCL [MRDL]	PHG [MRDLG]	CSD MDL (DLR)	CITY OF SAN DIEGO	MAJOR SOURCES IN DRINKING WATER					
Disinfectant Residual [Chloramines as Cl ₂]	ppm	[4] ^B	[4]	0.1	Distribution system average = 1.8	Range = ND - 3.6		Drinking water disinfectant added for treatment			
Chlorite ^A	ppm	1.0	0.05	(0.02)	Distribution system average = 0.40	Range = ND - 0.98		Byproduct of drinking water disinfection			
Haloacetic acids [HAA5]	ppb	60 ^c	n/a		Maximum LRAA = 17	Range = 1.5 - 34.3	Violation - NO	Byproduct of drinking water disinfection			
Total Trihalomethanes [TTHMs]	ppb	80 ^c	n/a		Maximum LRAA = 60	Range = 5.7 - 126	Violation - NO	Byproduct of drinking water chlorination			
^a Chlorite monitoring required only in the Southern section of the distribution system. ^b Compliance is determined by the distribution system average.											

^c Total Trihalomethane and HAA5 compliance is based on quarterly Locational Running Annual Averages (LRAA)

All 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 water treatment plants (WTP) 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 disinfection byproduct. The City's Otay WTP uses chlorine dioxide and chloramines for disinfection. When chlorine 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. Compliance with the MCL for bromate is determined quarterly on a Running Annual Average (RAA) basis, meaning that the average of values for bromate over the past year must fall below the MCL. All of our 2017 results for bromate and chlorite are in compliance with the MCL. Total Organic Carbon (TOC) has no health effects. It is monitored and reported here because it provides an assessment for the potential to form disinfection byproducts.

As drinking water travels from the City's WTPs through the distribution system and 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 2017 the City analyzed 7,066 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 in the distribution system. The MCL for TTHM LRAA is 80 ppb, and the MCL for HAA5 LRAA is 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 2017, our highest LRAA for TTHM was 60 ppb, and individual measurements ranged from 5.7 to 126 ppb. For HAA5, our highest LRAA was 17 ppb, and individual measurements ranged from 1.5 to 34.3 ppb.

SECONDARY STANDARDS (AESTHETICS STANDARDS)													
			CSD		CITY	OF SAN DIE	GO TREATMENT F	PLANTS		PURC	HASED		
		CA	MDL	ALV	ARADO	MI	MIRAMAR		OTAY		D WATER		
	UNITS	SMCL	(DLR)	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	MAJOR SOURCES IN DRINKING WATER	
Chloride	ppm	500	0.5	88.4	61.8 - 110	78.8	63.1 - 107	139	83.6 - 170	66.6	39.7 - 127	Runoff/leaching from natural deposits; seawater influence	
Color	CU	15	1	ND	ND - ND	ND	ND - 2	2	ND - 3	ND	ND - 1	Naturally - occurring organic materials	
Foaming Agents (MBAS)	ppb	500	30	70	n/a	40	n/a	70	n/a	ND	ND - ND	Municipal and industrial waste discharges	
Manganese	ppb	50	20	ND	ND - 41	ND	ND - ND	ND	ND - 23	9	ND - 27	Leaching from natural deposits	
Odor - Threshold	OU	3	(1)	ND	ND - 1	ND	ND - ND	1	1 - 1	1	ND - 3	Naturally - occurring organic materials	
Specific Conductance	µS/cm	1,600	n/a	746	476 - 970	652	495 - 977	876	618 - 1050	471	304 - 694	Substances that form ions when in water; seawater influence	
Sulfate	ppm	500	(0.5)	136	57.7 - 236	122	72.7 - 313	110	75.2 - 183	49	11.4 - 81	Runoff/leaching from natural deposits; industrial wastes	
Total Dissolved Solids	ppm	1000	10	457	293 - 625	391	291 - 635	511	355 - 620	268	80 - 426	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 2017.

OTHER PARAMETERS THAT MAY BE OF INTEREST													
						CII							
				CSD	AL	/ARADO	М	IRAMAR		OTAY	PURCHASED TREATED WATER		
	UNITS	MCL	PHG	MDL	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	
Sodium	ppm	n/a	n/a	20	77.9	52.2 - 100	67.6	53.4 - 96.4	103	67.4 - 125	51.4	32.7 - 80.4	
Total Hardness	ppm	n/a	n/a	10	214	139 - 283	179	138 - 295	214	156 - 258	94.1	43.4 - 129	
Total Hardness	gr/Gal	n/a	n/a	0.6	12.5	8.12 - 16.5	10.4	8.06 - 17.2	12.5	9.11 - 15.1	5.5	2.54 - 7.54	
Alkalinity - Total as CaCO ₃	ppm	n/a	n/a	10	111	83.6 - 130	90.3	71.0 - 116	123	78.7 - 145	68.9	48 - 88	
рН	рН	n/a	n/a	n/a	8.01	7.36 - 8.44	8.03	6.92 - 9.13	7.94	6.52 - 8.32	8.34	7.3 - 8.93	
Ammonia as Nitrogen	ppm	n/a	n/a	0.03	0.60	0.43 - 1.06	0.49	ND - 0.67	0.55	0.39 - 0.84	n/a	n/a	

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, pH and ammonia are included here because they have proven to be of interest to our customers.

DETECTED UNREGULATED PARAMETERS REQUIRING MONITORING												
				CITY OF SAN DIEGO TREATMENT PLANTS						PURCHASED		
				ALVARADO		MIRAMAR		OTAY		TREATED WATER		
	UNITS	NL	DLR	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	
Boron	ppm	1	0.1	0.13	0.10 - 0.14	0.13	0.12 - 0.14	0.16	0.13 - 0.20	0.27	0.11 - 0.95	
UCMR3 STUDY												
					CITY OF SAN DIEGO TREATMENT PLANTS						SAN DIEGO	
			UCMR3	ALVA	ALVARADO		MIRAMAR		OTAY		ION SYSTEM	
UCMR3 PARAMETERS	UNITS		MRL	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	MAJOR SOURCES IN DRINKING WATER
Bromochloromethane	ppb		0.06	ND	ND - ND	ND	ND - ND	ND	ND - 0.07	n/a	n/a	Fire extinguishers; pesticide solvent
Chlorodifluoromethane (HCFC-22)	ppb		0.08	ND	ND - 0.16	ND	ND - ND	ND	ND - ND	n/a	n/a	Refrigerant
Chlorate	ppb		20	ND	ND - ND	ND	ND - 25	165	140 - 200	81	0 - 160	Byproduct of drinking water disinfection
Chromium-6	ppb		0.03	0.09	0.08 - 0.11	0.16	0.03 - 0.36	0.04	ND - 0.09	0.06	ND - 0.11	Naturally-occurring metal;steel; chrome plating
Molybdenum	ppb		1	3.6	3.2 - 4.0	3.9	3.4 - 4.2	3.0	2.8 - 3.3	3.7	2.7 - 4.7	Naturally-occurring element; in ores and plants
Strontium	ppb		0.3	630	550 - 710	843	750 - 920	548	500 - 660	749	490 - 940	Naturally-occurring element
Vanadium	ppb		0.2	ND	ND - 0.25	ND	ND - 0.26	ND	ND - ND	0.29	ND - 0.84	Naturally-occurring metal; used as a catalyst
Note: LICMR3 Samples were collect	ed in 2013	and 201/										

As part of the 1996 Safe Drinking Water Act amendments, every five years the 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. UCMR3 was completed in 2014, and the next study (UCMR4) will take place between 2018 and 2020.

Under the most recent cycle of the Unregulated Contaminant Monitoring Rule (UCMR3), many parameters were studied at levels that are significantly below those in prior UCMR cycles. UCMR3 Minimum Reporting Levels (MRLs) were established based on the evolving capabilities of available analytical methodology, not based on a level established as significant or harmful. In short, UCMR examines what is in the drinking water, but additional information is needed to determine whether these contaminants pose a health risk. Results of UCMR3 measurements should be interpreted with this in mind. The detection of a UCMR3 parameter above the MRL does not represent cause for concern, in and of itself. Rather, the results should be judged considering available health effects information, which for unregulated contaminants is often still under development or being refined.

San Diego's drinking water was tested by an EPA-approved contract laboratory in the last two quarters of 2013 and first two quarters of 2014 for 28 UCMR3 unregulated contaminants. Of these 28 parameters, the seven listed in the "UCMR3 PARAMETERS" section of this table were detected. The MRLs set for the UCMR studies are based on the lowest level that can be detected using the chosen analytical method. For example, Chromium-6 was detected at levels in the range from <0.03 ppb to 0.36 ppb. DDW recently withdrew the 10 ppb MCL for Chromium-6. The levels detected in San Diego's water are typically 100 times less than 10 ppb.



Public Utilities Department 9192 Topaz Way San Diego, CA 92123







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 معلوماً ت مهمّة 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 他人为你翻译及解释清楚。

Farsi

امل اطلاعات مهمی را جع به آب آ شامید دی است. اگر نمیتوانید این اطلاعات را بزبان انگلیسی این اطلاعیه ش

بخوانیدلطفااز کسی که میتواندیاری بگیریدتا مطالب را بر ای 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 사용하십시요.

Laotian

ລາຍງານນີ້ມີຂໍ້ມູນສຳຄັນກ່ຽວກັບນ້ຳປະປາຂອງທ່ານ. ຈຶ່ງໃຫ້ຄົນອື່ນແປຄວາມໃຫ້ທ່ານ, ຫລືໃຫ້ປຶກສາກັບຄົນໃດຄົນໜຶ່ງທີ່ເຂົ້າໃຈເລື້ອງ.

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.

This information is available in alternative formats upon request.



Khamer របាយការណ៍នេះមានពត៌មានសំខា ន់អំព័ទឹកបរិកោក ។ ស្ងមបកប្រែ ឬពិគ្រោះជាម្លួយអ្នកដែលមើលយល់ របាយការណ៍នេះ ។