

THE CITY OF SAN DIEGO

# 2013 Annual Drinking Water Quality Report



Quality - Value - Reliability - Customer Service



# Our Water Supply

## Why is There Anything in My Water?

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 by-products 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 (USEPA) and the California Department of Public Health (CDPH) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection for public health. The 2010 Watershed Sanitary Survey, which contains information on the City's watersheds, is available at: [www.sandiego.gov/water/quality/environment/sanitarysurvey.shtml](http://www.sandiego.gov/water/quality/environment/sanitarysurvey.shtml)

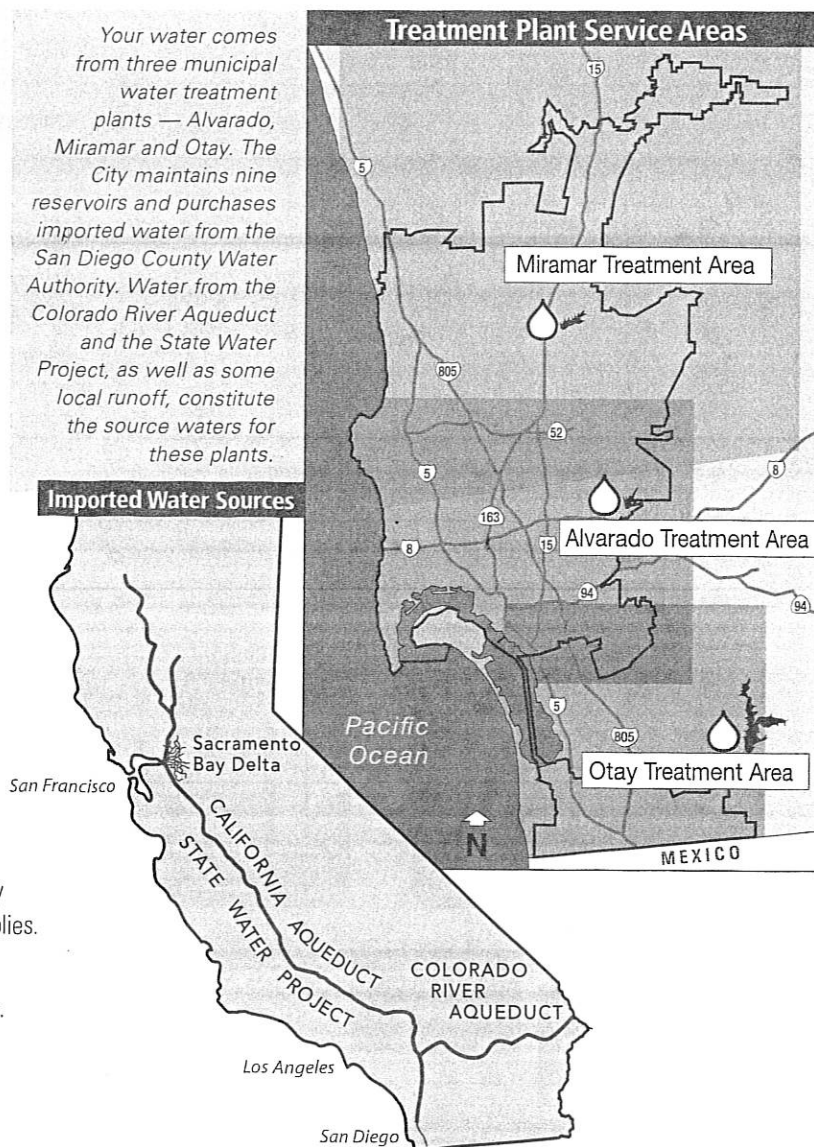
## Our Imported Water Supply and the Impact on Water Quality

The City of San Diego imports an average of 85 percent of its water. This imported water is provided by the San Diego County Water Authority, which purchases water from the Metropolitan Water District of Southern California. Ultimately, our imported water is a blend of Colorado River water and State Water Project water (see map). Throughout the year, the blend changes.

Several forces negatively 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 also 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 by-products exists. (The disinfectants used to treat water can react with naturally occurring materials in the water to form unintended by-products which may pose health risks). The City continually alters its treatment process to adjust for changing water supplies.

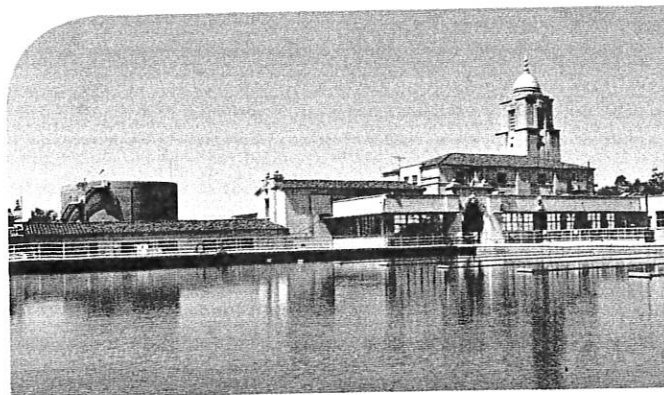
The City of San Diego regularly monitors the quality of our water to ensure all drinking water quality standards are met.



# Our Water Treatment Process

The City's Public Utilities Department provides high-quality drinking water by utilizing proven technology, updated facilities, and state-certified operators. Water is treated at the City's three treatment plants using several processes, with each process providing additional water quality improvements. Using several treatment processes provides multiple barriers for added safety.

Conventional water treatment consists of coagulation, flocculation, sedimentation, and sand/multi-media filtration. Utilizing tried and tested conventional processes offers many advantages, some of which are: extensive knowledge of the processes, proven performance, cost-effective operation, and acceptance by regulators. Combined with the conventional treatment process, advanced disinfection has been added to the treatment plants.



## THE WATER TREATMENT PROCESSES WE USE ARE:

**Watershed protection:** San Diego receives water from local rain collected in City reservoirs and from imported water. Imported water comprises 85 to 90 percent of our water and travels hundreds of miles before reaching our water treatment plants. 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. So when you see "No Swimming" or "No Dumping" near water supplies we hope you understand this is for the protection of your drinking water.

**Coagulation:** This is the chemical process of rapidly mixing coagulants to the water coming into the water treatment plant (source water). 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 the 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

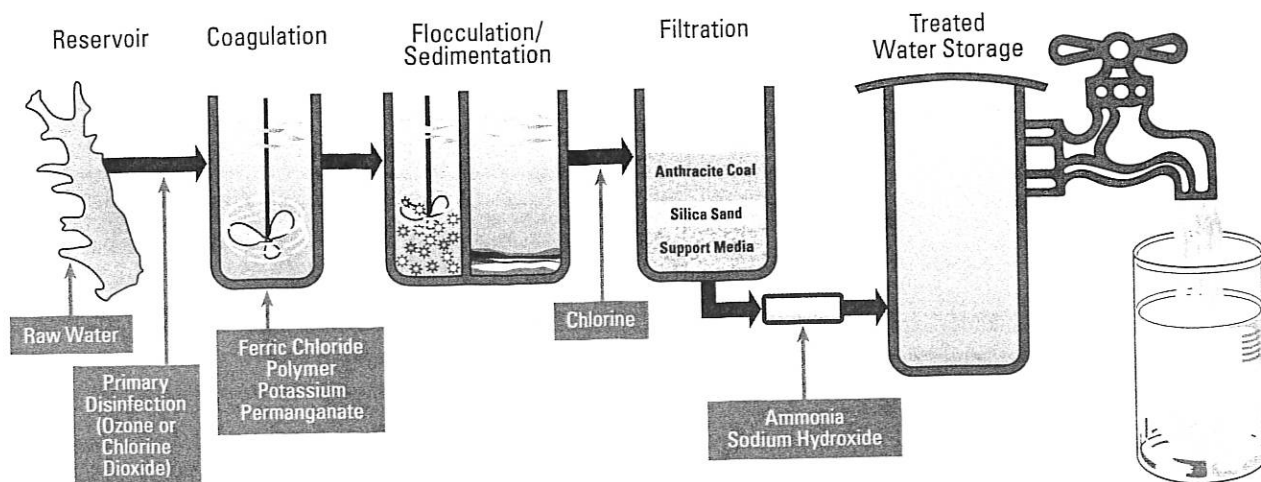
basins. The floc settles to the bottom and is removed. The clear water is collected from the top of the sedimentation basins and sent to the filters.

**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 turbidities (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 as the last step in the treatment process. 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.





## 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. USEPA/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). During calendar year 2013, 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 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 U.S. Environmental Protection Agency's (USEPA) Safe Drinking Water Hotline at 800-426-4791. For a list of action levels, visit the California Department of Public Health (CDPH) website at [www.cdph.ca.gov](http://www.cdph.ca.gov).



### HOW TO READ THE TABLES

The tables on the following pages list contaminants which 1) CDPH requires the City to monitor, 2) CDPH regulates with associated primary [health] or secondary [aesthetic], or no established standards. During 2013, these contaminants were detected at or above the CDPH's Detection Limits for Purposes of Reporting during the reporting year.

These tables summarize monitoring from January – December 2013 with two exceptions (see table footnotes). The CDPH mandates monitoring radioactive contaminants every three years. The Lead and Copper Rule was conducted in 2011, and is monitored every three years. The levels of these contaminants are not expected to vary significantly from year to year.

### 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.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically or technologically feasible. Secondary MCLs 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. MCLGs are set by the U.S. EPA.

**Maximum Residual Disinfectant Level (MRDL):** The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

**Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a disinfectant added for water treatment below, which there is no known or expected health risk. MRDLGs are set by the U.S. EPA.

**Notification Level:** Health-based advisory levels established by CDPH for chemicals in drinking water that lack maximum contaminant levels (MCLs). 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. PHGs are set by the California EPA.

**Primary Drinking Water Standard (PDWS):** MCLs and MRDLs 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

**CDPH:** California Department of Public Health

**CSD MDL (City of San Diego Water Quality Lab method detection limit):** lowest quantifiable concentration of a measured analyte detectable by the lab

**CU:** color units

**DLR:** detection limit for reporting

**gr/Gal:** grains per gallon

**ml:** milliliter

**MWD:** Metropolitan Water District of Southern California

**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 ( $\mu\text{g/L}$ ) – [1 ppb = 0.001 ppm]

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

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

**$\mu\text{S/cm}$ :** micro-siemens/cm

**<** less than

**>** greater than

# PRIMARY STANDARDS (MANDATORY HEALTH RELATED STANDARDS)

PRIMAINT STANDARDS (MANDATORY HEALTH RELATED STANDARDS)													
CHEMICAL PARAMETERS	UNITS	MCL	PHG (MCLG)	CDPH DLR	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT		MAJOR SOURCES IN DRINKING WATER
					ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Fluoride (naturally occurring)	ppm	2	1	0.1	0.2	0.2 - 0.3	0.3	0.2 - 0.4	0.4	0.3 - 0.6	0.3	0.1 - 0.3	Erosion of natural deposits
Fluoride (treatment-related)	ppm	2	1	0.1	0.8	0.7 - 0.9	0.8	0.7 - 1.0	0.6	0.4 - 0.8	0.8	0.7 - 1.0	Water additive that promotes strong teeth

Note: Optimal Fluoride Level = 0.7 ppm; Control Range = 0.6 - 1.2 ppm

## Fluoride:

California state law requires water agencies with more than 10,000 water service connections to fluoridate their drinking water. In February 2011, the City of San Diego's water treatment plants began this state-mandated fluoridation. For more information, visit <http://www.sandiego.gov/water/quality/fluoridation.shtml>.

San Diego's source waters contain naturally occurring fluoride at levels that range from 0.2 to 0.6 ppm. State regulations require the fluoride levels in the treated water be maintained

within a range of 0.6 - 1.2 ppm with an optimum dose of 0.7 ppm. Our water system treats your water by adding fluoride to the naturally occurring level to help prevent dental caries in consumers. Our monitoring showed fluoride levels in the treated water ranging from 0.4 to 1.0 ppm, with average values of 0.6 - 0.8 ppm. Information about fluoridation, oral health, and current issues is available from [www.cdph.ca.gov/certlic/drinkingwater/Pages/Fluoridation.aspx](http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Fluoridation.aspx).

RADIOACTIVE PARAMETERS	UNITS	MCL	PHG (MCLG)	CDPH DLR	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT		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	4.6	n/a	ND	n/a	ND	n/a	ND	ND - 3	Erosion of natural deposits
Gross Beta Particle Activity	pCi/L	50*	(0)	4	ND	n/a	ND	n/a	ND	n/a	ND	ND - 5	Decay of natural and manmade deposits
Uranium	pCi/L	20	0.43	1	2.4	n/a	1.7	n/a	1.2	n/a	1	ND - 2	Erosion of natural deposits

Note: Regulations require monitoring every three years. Most recent monitoring: 2013 for Alvarado, 2012 for Miramar and Otay, 2011 for MWD Skinner.

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

## Radioactive Parameters:

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material. Radioactive contaminants can be naturally occurring or be the result of oil and gas production and mining activities.

Regulations require that the City of San Diego monitor for Radioactive Parameters every three years. The results in this report are presented in units of pCi/L, or picocuries per liter; this represents an amount of radiation. Our results are significantly below the MCL for all radioactive parameters.

MICROBIOLOGICAL	UNITS	MCL	PHG (MCLG)	CDPH DLR	CITY OF SAN DIEGO DISTRIBUTION SYSTEM		MWD DISTRIBUTION SYSTEM		MAJOR SOURCES IN DRINKING WATER
					AVERAGE	RANGE*	AVERAGE	RANGE	
Total Coliform Bacteria	/100ml	< 5% Positive	(0)	n/a	0.2%	0 - 0.8%	ND	ND - 0.2%	Naturally present in the environment

\*Based on Monthly Percentages of Positive Total Coliform samples

## Total Coliform Bacteria:

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful bacteria may be present. The CDPH regulations require the City to test a minimum of 85 samples per week from throughout the distribution system for total coliform and E.coli, and to report the results, including the percentage of total Coliform positive samples in a given month. To meet this requirement, in 2013 the City of San Diego collected and analyzed 6,826 samples from the distribution system (an average of 131 per week) for total coliform and E. coli. The MCL is 5.0%; this means that

if more than 5.0% of the monthly samples collected are total coliform positive, then the MCL is violated. In 2013 the City did not exceed the monthly MCL for total coliform bacteria; our maximum was 0.8% of monthly samples. The regulations are written as a percentage of monthly samples because multiple variables can cause a positive result, including localized contamination at the tap. Each time any sample tests positive, three repeat samples are collected and the cause of the positive result investigated.

TURBIDITY	UNITS	MCL	PHG (MCLG)		CITY OF SAN DIEGO TREATMENT PLANTS			MWD SKINNER TREATMENT PLANT	MAJOR SOURCES IN DRINKING WATER
					ALVARADO	MIRAMAR	OTAY		
Turbidity	NTU	TT = 1 NTU	n/a	----	Max Level Found = 0.11	Max Level Found = 0.14	Max Level Found = 0.13	Max Level Found = 0.09	Soil runoff
Turbidity	NTU	TT = 95% of samples ≤ 0.3 NTU	n/a	----	100% of samples ≤ 0.3 NTU	100% of samples ≤ 0.3 NTU	100% of samples ≤ 0.3 NTU	100% of samples ≤ 0.3 NTU	Soil runoff

## Turbidity:

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. San Diego's three water treatment plants monitor for turbidity every 15 minutes to ensure uniform quality of water produced for our customers. Our consistently very low turbidity results attest to the high quality of drinking water produced and have led to our treatment plants receiving awards for quality – for example Otay Treatment Plant has been awarded the Directors Award for six consecutive years from

the American Water Works Association (AWWA) Partnership for Safe Water (PSW) Program; Miramar has two years of Directors Award and is one of only six plants nationwide to receive the Presidents Award from the PSW; and Alvarado Treatment Plant recently received the American Society of Civil Engineers award for innovation in plant design and continuous operation during upgrade, and participates in the Partnership for Safe Water program.

LEAD AND COPPER STUDY	UNITS	ACTION LEVEL	PHG (MCLG)	CDPH DLR	SAMPLES TAKEN FROM CUSTOMER TAPS				MAJOR SOURCES IN DRINKING WATER
					90th PERCENTILE CONCENTRATION	SAMPLING SITES	NUMBER EXCEEDING AL	VIOLATION	
Copper	ppm	1.3	0.3	0.050	0.309	50	0	NO	Internal corrosion of household plumbing systems
Lead	ppb	15	0.2	5	ND	50	3	NO	Internal corrosion of household plumbing systems

Note: Monitoring mandated every three years. Most recent monitoring conducted in 2011.

#### Lead and Copper:

Lead and copper enter drinking water primarily through plumbing materials. 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 to control lead and copper in drinking water. The rule requires us to monitor drinking water at customer taps. If lead concentrations exceed an action level of 15 ppb or copper concentrations exceed an action level of 1.3 ppm in more than 10% of taps sampled, we would be required to undertake a number of additional actions to inform the public and control corrosion.

In 2011, fifty customers provided samples from their taps to the City of San Diego for lead and copper analysis. The results of these tests are presented here. Because less than 10% of our results were above the Action Levels for Lead and Copper, no additional actions were required. Lead and Copper Rule monitoring must be conducted every three years – our next study will be conducted in 2014.

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at

other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and/or flush your tap for 30 seconds to two minutes before using tap water. Additional information is available from the USEPA Safe Drinking Water Hotline (1-800-426-4791).

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/safewater/lead>.

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

	UNITS	MCL [MRDL]	PHG (MCLG) [MRDLG]	CDPH DLR	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT		MAJOR SOURCES IN DRINKING WATER
					ALVARADO		MIRAMAR		OTAY				
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	
Bromate*	ppb	10	0.1	5	ND	ND - 7.0	ND	ND - ND	NA	NA	5.9***	1.0 - 11	By-product of drinking water disinfection
Chlorate**	ppb	NL=800 PPB		20	n/a	n/a	n/a	n/a	135	63.1- 239	51	28-72	By-product of drinking water disinfection
Chlorite**	ppm	1	0.05	0.02	n/a	n/a	n/a	n/a	0.28	ND - 0.53	NA	NA	By-product of drinking water disinfection
Total Organic Carbon [TOC]	ppm	TT	n/a	0.3	2.7	2.0 - 3.7	2.4	2.1 - 2.7	4.2	2.5 - 5.3	2.2***	2.1 - 2.4	Various natural and manmade sources

\*Required for Alvarado, Miramar, and Skinner \*\*Required for Otay \*\*\* Highest Running Annual Average

	UNITS	MCL [MRDL]	PHG [MRDLG]	DLR	CITY OF SAN DIEGO DISTRIBUTION SYSTEM				MAJOR SOURCES IN DRINKING WATER	
Disinfectant Residual [Chloramines as Cl <sub>2</sub> ]	ppm	[4] <sup>A</sup>	[4]	----	Distribution system average <sup>3</sup> = 2.2		Range <sup>3</sup> = ND - 4.1		----	Drinking water disinfectant added for treatment
Chlorite <sup>1</sup>	ppm	1	0.05	0.02	Distribution system average <sup>3</sup> = 0.24		Range <sup>3</sup> = ND - 0.44		----	By-product of drinking water disinfection
Haloacetic acids [HAA5]	ppb	60 <sup>B</sup>	n/a	----	Maximum LRAA = 15		Range <sup>3</sup> = 4.3 - 20.4		LRAA Violation - NO	By-product of drinking water disinfection
Total Trihalomethanes [THMs]	ppb	80 <sup>B</sup>	n/a	----	Maximum LRAA = 66		Range <sup>3</sup> = 27.6 - 86.2		LRAA Violation - NO	By-product of drinking water chlorination

<sup>1</sup> Chlorite monitoring required only in the Southern section of the distribution system.

<sup>3</sup> Range and average are based upon individual 2013 sample results.

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

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

All drinking water must be disinfected during treatment to ensure that potentially dangerous microbes are killed. There are a variety of disinfection strategies used throughout the United States. San Diego utilizes some of the more advanced disinfection technologies available. Our Miramar and Alvarado treatment plants use ozone for disinfection, in addition to chloramines. Ozone produces less organic disinfection byproducts than chlorine or chloramines alone and thus is considered a superior disinfection method. All disinfectants have some sort of byproduct, however. When ozone is used, bromate is monitored as a potential disinfection byproduct. Our Otay Treatment Plant uses chlorine dioxide for disinfection, in addition to chloramines. When chlorine dioxide is used, chlorite is monitored as a potential disinfection byproduct. All of our results for bromate and chlorite are below the MCL established by CDPH.

In order to prevent growth of potentially dangerous microbes as drinking water travels from our treatment plant through our distribution system to your home or business, a disinfectant

residual must be maintained. San Diego uses chloramines as the residual disinfectant in the distribution system. We analyzed 7,039 samples for chloramines throughout the distribution system in 2013; the average residual was 2.2 ppm and the maximum was 4.1 ppm.

Another category of disinfection byproducts that CDPH and the EPA regulate are Trihalomethanes (THMs) and Haloacetic Acids (HAAs). In 2012 San Diego began monitoring these under EPA's Stage 2 Disinfection Byproduct (DBP) rule. Compliance with the MCL under the Stage 2 rule is based on the running annual average at each location in the distribution system, rather than the system-wide running annual average previously used. The MCL for THMs is 80 ppb, and the MCL for HAAs is 60 ppb. San Diego has had no violations of the Stage 2 DBP MCLs to date. In 2013 our highest LRAA for Total Trihalomethanes was 66, and the range of individual measurements was 27.6 - 86.2 ppb. For Haloacetic Acids, our highest LRAA was 15, and the range of individual measurements was 4.3 - 20.4 ppb.



## OTHER PARAMETERS THAT MAY BE OF INTEREST

	UNITS	MCL	PHG (MCLG)	CSD MDL	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT	
					ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE
					AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE		
Sodium	ppm	na	na	20	73.4	63.5 - 83.8	74.7	61.7 - 84.3	99.4	91.7 - 109	80	78 - 81
Total Hardness	ppm	na	na	10	209	142 - 243	214	136 - 249	241	233 - 252	230	230 - 240
Total Hardness	gr/Gal	na	na	0.6	12.2	8.3 - 14.2	12.5	8.0 - 14.6	14.1	13.6 - 14.7	13.4	13.4 - 14.0
Alkalinity - Total as CaCO <sub>3</sub>	ppm	na	na	10	106	74.2 - 123	98.2	74.4 - 114	130	116 - 150	110	72 - 130
pH	pH	na	na	na	8.14	7.15 - 8.67	8.19	6.90 - 8.60	8.11	6.96 - 8.88	8.2	8.2
Ammonia as Nitrogen	ppm	na	na	0.03	0.69	0.48 - 0.99	0.60	0.39 - 0.85	0.61	0.48 - 0.82	na	na

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 is required by CDPH and results are presented in this Annual Drinking Water Quality Report.

Sodium refers to the salt present in the water and is generally naturally occurring. Hardness is the sum of polyvalent cations present in the water, which is essentially the sum of magnesium and calcium. These cations are usually naturally occurring.

## DETECTED REGULATED CCR PARAMETERS WITH SECONDARY MCLs

	UNITS	CA SMCL	CSD MDL (DLR)	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT		MAJOR SOURCES IN DRINKING WATER
				ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
				AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Chloride	ppm	500	0.5	86.9	79.9 - 96.7	85.3	77.4 - 90.7	133	116- 152	84	83 - 86	Runoff/leaching from natural deposits; seawater influence
Color	CU	15	1	1	ND - 4	ND	ND - 2	1	ND - 2	2	1 - 2	Naturally-occurring organic materials
Manganese	ppb	50	(20)	ND	ND - 33.5	ND	ND - ND	ND	ND - ND	ND	ND	Leaching from natural deposits
Odor - Threshold	OU	3	1	ND	ND - 1	ND	ND - 1.4	1	1 - 1.4	2	2	Naturally-occurring organic materials
Specific Conductance	µS/cm	1,600	n/a	730	471 - 860	723	465 - 860	894	789 -1070	850	830 - 870	Substances that form ions when in water; seawater influence
Sulfate	ppm	500	(0.5)	133	72.9 - 187	154	71.0 - 188	129	103 - 158	170	170 - 180	Runoff/leaching from natural deposits; industrial wastes
Total Dissolved Solids	ppm	1000	10	466	337 - 580	477	337 - 570	564	533 - 659	510	500 - 520	Runoff/leaching from natural deposits

Primary standards (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 reasonably expected to occur when levels are below a primary MCL. 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 taste or smell bad. These parameters are not considered to present a risk to human health at or above Secondary MCL levels.

## DETECTED UNREGULATED PARAMETERS REQUIRING MONITORING

	UNITS	NOTIFI- CATION LEVEL	CDPH DLR	CITY OF SAN DIEGO TREATMENT PLANTS						MWD SKINNER TREATMENT PLANT		MAJOR SOURCES IN DRINKING WATER
				ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
				AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Boron	ppm	1	0.1	ND	ND - 0.12	0.11	0.11 - 0.12	0.12	0.12 - 0.13	0.12	0.12	Runoff/leaching from natural deposits; industrial wastes
UCMR3 PARAMETERS	UNITS		UCMR3 MRL	CITY OF SAN DIEGO TREATMENT PLANTS						CITY OF SAN DIEGO DISTRIBUTION SYSTEM		MAJOR SOURCES IN DRINKING WATER
				ALVARADO		MIRAMAR		OTAY		AVERAGE	RANGE	
				AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE			
Bromochloromethane	ppb	----	0.06	ND	ND - ND	ND	ND - ND	ND	ND - 0.07	NA	NA	Fire extinguishers; pesticide solvent
Chlorate	ppb	800	20	ND	ND - ND	ND	ND - 25	170	140 - 200	92	39 - 160	By-product of drinking water disinfection
Chromium-6	ppb	----	0.03	0.10	0.09 - 0.11	0.10	0.03 - 0.17	0.045	ND - 0.09	0.062	ND - 0.11	Naturally-occurring metal;steel; chrome plating
Molybdenum	ppb	----	1	3.3	3.2 - 3.4	3.7	3.4 - 3.9	3.1	2.8 - 3.3	3.5	2.7 - 3.7	Naturally-occurring element; in ores and plants
Strontium	ppb	----	0.3	555	550 - 560	770	750 - 790	585	510 - 660	718	490 - 800	Naturally-occurring element
Vanadium	ppb	50	0.2	ND	ND - 0.25	0.21	0.21 - 0.21	ND	ND - ND	0.34	ND - 0.84	Naturally-occurring metal; used as a catalyst

The 1996 Safe Drinking Water Act (SDWA) amendments require that once every five years EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems. This monitoring provides a basis for future regulatory actions to protect public health. The Unregulated Contaminant Monitoring Rule (UCMR) program was developed in coordination with the Contaminant Candidate List (CCL). The CCL is a list of contaminants that are not regulated by the National Primary Drinking Water Regulations, are known or anticipated to occur at public water systems and may warrant regulation under the Safe Drinking Water Act.

Under the current cycle of the Unregulated Contaminant Monitoring Rule (UCMR 3) chemicals are being studied at levels that are often significantly below those in prior UCMR cycles. Importantly, UCMR 3 minimum reporting levels (MRLs) were established based on the capacity of the analytical method, not based on a level established as "significant" or "harmful". In fact, the UCMR 3 MRLs are often below current "health reference levels" (to the extent that HRLs have been established).

Results of UCMR3 measurements should be interpreted accordingly. The detection of a UCMR 3 analyte above the MRL does not represent cause for concern, in and of itself. Rather, the implications of the detection should be judged considering health effects information (which is often still under development or being refined for unregulated contaminants).

San Diego's treated drinking water was tested by an EPA-approved contract laboratory in the last two quarters of 2013 for 28 unregulated contaminants. Of these 28 parameters, the six listed in the "UCMR3 PARAMETERS" section of this table were detected. It's important to note that the UCMR monitoring occurs to compile a database used to help guide future regulations. The MRLs set for the UCMR studies are based on the capacity of the analytical method, not on any level established as significant or harmful. For example, Chromium-6 was detected at levels in the range from <0.03 ppb to 0.17 ppb. CDPH recently proposed an MCL for Chromium-6 of 10 ppb. The levels detected in San Diego's water are roughly 100 times less than this proposed MCL.

## Sustainability

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



### PURE WATER SAN DIEGO



recycled water into drinkable water through the use of water purification technology. The recycled water is purified using membrane filtration, reverse osmosis and advanced oxidation with ultraviolet light and hydrogen peroxide.

To confirm the viability and safety of using water purification technology, the City conducted a demonstration project from 2009 to 2013. One million gallons of water were purified every day for a year at the City's Advanced Water Purification Facility. More than 9,000 water quality tests ensured that no contaminants were present in the water and the project results confirmed that recycled water

The City of San Diego is addressing the need for new local sources of water. Pure Water San Diego is a phased multi-year program that will provide a safe, secure and sustainable local drinking water supply by turning

can be purified and safely added to a reservoir. The California Department of Public Health and San Diego Water Board approved the water purification concept and confirmed the purified water meets all federal and state drinking water standards.

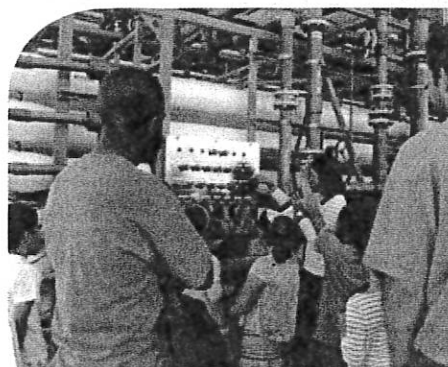
Pure Water San Diego is the next step toward implementing water purification in San Diego. An initial 15-million gallon per day water purification facility is planned to be in operation by 2023. The long term goal is to produce up to one third of San Diego's drinking water supply through the use of water purification technology by 2035.

The City is working to determine whether the purified water would be added to a reservoir or if there are additional treatment barriers that could potentially replace the reservoir in a full-scale water purification facility. Other program components include devising a financial plan, acquiring land for the full-scale facilities and developing regulations and legislation.

Pure Water San Diego would benefit the City by increasing water independence and combating climate change, drought conditions and natural disasters. Diverting more water for recycling would also reduce the amount of wastewater discharged to the ocean. Additionally, Pure Water San Diego would eliminate the need for \$1.8 billion of upgrades to the Point Loma Wastewater Treatment Plant.

To learn more about Pure Water San Diego, visit [www.purewatersd.org](http://www.purewatersd.org).

#### Free Tours of the Advanced Water Purification Facility



Since July 2011, the City of San Diego has been offering free tours of the Advanced Water Purification (AWP) Facility to members of the public. During the tour, the water purification process is explained in detail and participants get an up-close look at

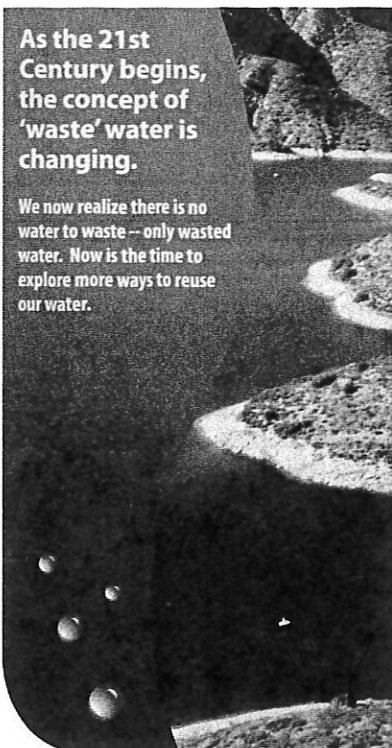
the technology used to turn recycled water into safe drinkable water. In addition, guests get to see the comparison of purified water, tap water and recycled water and learn how water purification can combat San Diego's water supply challenges.

More than 350 AWP Facility tours have been given to groups including Boy Scout and Girl Scout troops, elected officials, contractors, neighborhood councils, water industry professionals and school classes ranging from elementary to postdoctoral. To date, more than 5,000 people have toured the AWP Facility, some from as far away as China and Australia.

The AWP Facility is located at the North City Water Reclamation Plant, off of Miramar Road. To sign up for a tour, visit [www.purewatersd.org/tours](http://www.purewatersd.org/tours), email [purewatersd@sandiego.gov](mailto:purewatersd@sandiego.gov) or call (619) 533-4631.

**As the 21st Century begins, the concept of 'waste' water is changing.**

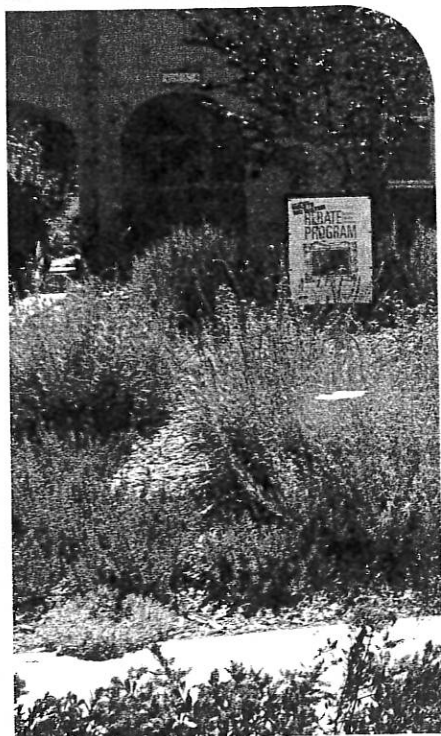
We now realize there is no water to waste -- only wasted water. Now is the time to explore more ways to reuse our water.





## PERMANENT WATER-WASTE RESTRICTIONS

California is experiencing historic drought conditions and it is important to remind our customers of the permanent water-waste restrictions that are in force year round in San Diego. Several years ago, the San Diego City Council approved these permanent restrictions. San Diego residents are encouraged to report water waste by calling the Water Waste Hotline at (619) 533-5271, and visit our website at [www.wastenowater.org](http://www.wastenowater.org) for a list of the permanent restrictions as well as resources and information on how to be water wise. Remember, conservation is a way of life!



## Conservation Resources for Our Customers

**No-Cost Residential and Commercial Water Surveys** — Public Utilities' Water Conservation Program offers free residential and commercial water surveys to water customers who pay their water bills to the City of San Diego. This program pinpoints water-saving options at your home or business, including possible leaks and other water waste. The surveys are offered free-of-charge to eligible single-family and multifamily (up to eight units) water customers. As part of this program, a Water Conservation Representative will tour your property in person, and participants can receive water-saving equipment and information, including low-flow shower heads, faucet aerators and other free items. The representative will also evaluate your landscape and irrigation systems. Since this program emphasizes customer education, it is important the tenant/occupant be present at the time of the survey.

**Rebates and Incentives** — Customers may qualify for various water conservation rebates and incentives both locally and regionally. These programs may include rebates for turf replacement (both residential and commercial), rain barrels, smart controllers and micro-irrigation. More information is available on the following websites, or you can email [waterconservationrebates@sandiego.gov](mailto:waterconservationrebates@sandiego.gov) to be directed to the agency currently offering the specific rebate you are seeking:

[www.sandiego.gov/water/conservation/residentialoutdoor/index.shtml](http://www.sandiego.gov/water/conservation/residentialoutdoor/index.shtml)  
[www.socalwatersmart.com](http://www.socalwatersmart.com)  
<http://turfreplacement.watersmartsd.org/>

## RECYCLED WATER PROGRAM

To meet future water demands while reducing our dependence on imported water, the City of San Diego has built the North City Water Reclamation Plant and the South Bay Water Reclamation Plant. These plants treat wastewater to a level that is approved for irrigation, manufacturing and other non-drinking, or non-potable purposes. The North City Plant has the capability to treat 30 million gallons a day and the South Bay Plant can treat 15 million gallons a day. Recycled water gives San Diego a dependable, year-round, locally controlled water resource. For more information, visit [www.sandiego.gov/water/recycled](http://www.sandiego.gov/water/recycled).

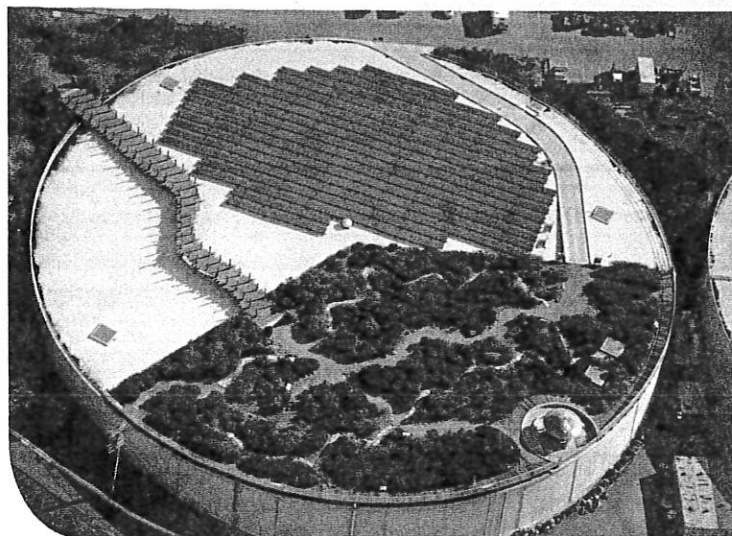


## RENEWABLE ENERGY & EFFICIENCY PROGRAM

The City of San Diego is committed to sustainability and the efficient use of resources and has a very dynamic Renewable Energy and Efficiency Program within the Public Utilities Department. Together with its private partners, the Department's facilities generate more renewable energy than any other San Diego Gas & Electric customer. This impressive standing contributes to the Department's environmental stewardship, provides some energy independence, helps reduce operating costs and ultimately helps keep rates lower for customers.

In fact, some of the Public Utilities facilities produce enough energy to operate the facilities and still sell excess energy back to SDG&E to generate revenue. The City's excess energy production helps supply energy to such important institutions as the Marine Corps Air Station (MCAS) Miramar and the University of California, San Diego. Public Utilities Department facilities, with private partners, utilize a number of energy sources to generate energy, including digester gas, landfill gas, bio methane, hydroelectric, solar and fuel cells.

This commitment to sustainability has not gone unnoticed. In 2013, the City of San Diego was recognized with the SDG&E Energy Showcase Award for Local Government, due in part to the efforts of the Public Utilities Department to create renewable energy. The California Center for Sustainable Energy awarded the Public Utilities Department their 2010 Energy All-Star Award for Outstanding Organization. In 2006, the City of San Diego



was recognized by the U.S. EPA for utilizing more renewable energy than any other public agency in the United States. The Wastewater Branch of the Public Utilities Department utilized 96 percent of that energy to offset the purchase of non-renewable energy. In 1998, the San Diego Taxpayers Association honored the Metro Biosolids Center's privatized landfill gas-fired cogeneration facility with its Golden Watchdog Award.

For more detailed information on the Public Utilities Renewable Energy and Efficiency Program, visit [www.sandiego.gov/publicutilities](http://www.sandiego.gov/publicutilities).

## Your Dollars at Work

The City of San Diego's Public Utilities Department recognizes the importance of its responsibility with the money you pay for water and sewer service.

Between 85 and 90 percent of our drinking water has to be imported, and much of the money you pay on your Public Utilities bill goes toward the purchase of water. The Department treats and delivers approximately 173 million gallons of water each day. Water is an expensive resource that must be transported and properly treated to make sure it is safe and healthy, and meets all state and federal regulations.

The City of San Diego has a very complex water system, and the Public Utilities Department continues to look for ways to reduce costs and improve efficiency, including streamlining services and consistently reviewing our processes to make sure we are doing the best job possible.

Each year the Public Utilities Department's budget is analyzed in public City Council meetings and is available for public review. Also, the Independent Rates Oversight Committee holds monthly public meetings and advises the City regarding the department's

### Fiscal Year 2014 Water Operations & Maintenance and Capital Improvement Project Budget

Fiscal Year 2014 Water Budget	
Total by Category	FY14
Personnel	\$46,328,993
Pension & OPEB*	\$20,773,464
Non-Personnel Expense (Energy & Utilities, IT Expenses, and Supplies)	\$50,356,598
Contracts	\$40,535,932
Debt	\$67,211,200
Water Purchases	\$209,074,594
Capital Improvement Projects	\$49,836,598
<b>Total</b>	<b>\$484,117,379</b>

Personnel  
\$46,328,993



Non-Personnel  
Expense  
\$50,356,598

Contracts  
\$40,535,932



Debt  
\$67,211,200

Water Purchases  
\$209,074,594



Capital  
Improvement  
Projects  
\$49,836,598

Pension & OPEB\*  
\$20,773,464

**Grand Total \$484,117,379**

\*Other Post-Employment Benefits

management, expenditures and services. The Committee also assists in tracking and reviewing the use of rate proceeds to advance the infrastructure improvements.

For more detailed information, visit [www.sandiego.gov/publicutilities](http://www.sandiego.gov/publicutilities).