

Los Angeles



Department of Water & Power

WATER

FOR

LOS ANGELES





MISSION:

To provide our customers with safe, reliable, high quality and competitively priced water services in a publicly and environmentally responsible manner.



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WATER FOR LOS ANGELES

Overview

No single factor has been as important to the establishment and growth of Los Angeles as water. Early in the city's history, the Los Angeles River was the only source of water. Water **from the River** was distributed in open ditches and later in wooden and cast iron pipes. In 1902, the City of Los Angeles purchased the Los Angeles City Water Company, a private company, which eventually became the Los Angeles Department of Water and Power (LADWP).

The city faced unprecedented growth in the early 1900s. New water resources were needed, and LADWP delivered. The First Los Angeles Aqueduct was completed in 1913 and delivered pristine snowmelt runoff from the Owens Valley, more than 200 miles away. In 1928, Los Angeles joined with other cities to form the Metropolitan Water District of Southern California (MWD). MWD, a water wholesaler, would bring additional supplies from the Colorado River and Northern California to the city and surrounding communities. The Second Los Angeles Aqueduct was completed in 1970 and commenced deliveries to meet growing water needs.

Today, LADWP is the largest municipally owned and operated retail water utility in the country, serving a population of about four million residents and an area of 464 square miles. Los Angeles' annual water demand is about 197 billion gallons.

Water Infrastructure

LADWP provides water service through a complex and expansive network of large and small pipes measuring a total of more than 7,200 miles in length. Though typically unseen, underground water distribution pipelines serve the important function of delivering water to Los Angeles homes and businesses.

Trunk lines, which are large pipes varying in diameter from 20 inches to 144 inches, are used to transport water from wells and aqueducts to reservoirs and enable the movement of water from one area of the city to another. These large pipes connect to smaller pipes known as distribution mains that supply water to each customer's individual service connection. Water meters at each service connection then measure the customer's water use.

What's in LA's water distribution system?

- 1** Los Angeles Aqueduct Filtration Plant
- 2** Los Angeles Aqueducts
- 3** Groundwater Treatment Facilities
- 7** Fluoridation Stations
- 24** Chlorination Stations
- 78** Pumping stations
- 114** Tanks and Reservoirs
- 421** Pressure Regulator Stations
- 500** Miles of Trunk Lines
- 7,221** Miles of Distribution Mains
- 60,115** Fire Hydrants



Water flows by gravity 338 miles from the Mono Basin and 233 miles from the Owens Valley along the First and Second Los Angeles Aqueducts.

Water Supply

Los Angeles' water supply comes from four sources: the Eastern Sierra Nevada, delivered via the Los Angeles Aqueducts (LAA); local groundwater; imported water purchased from the Metropolitan Water District of Southern California (MWD) via the California and Colorado River Aqueducts; and recycled water for non-potable uses, which is an emerging source of water for the future.

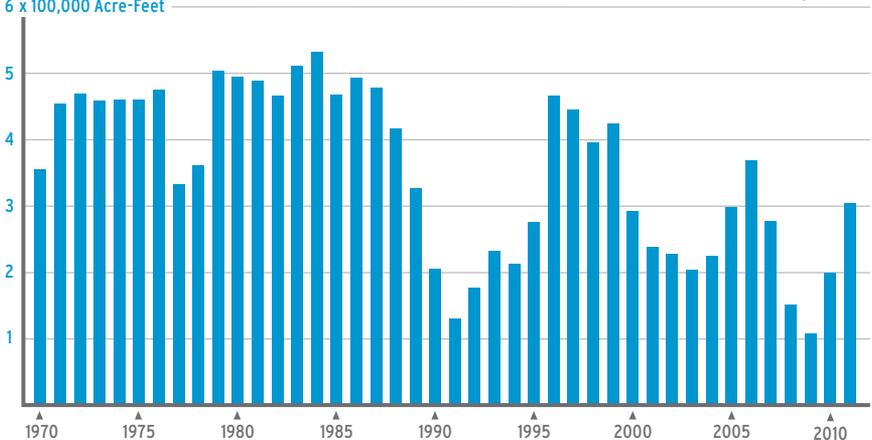


The availability of the city's traditional sources of water is changing. Los Angeles Aqueduct deliveries have been reduced significantly due to environmental restoration activities in the Owens Valley. Similarly, imported water from MWD is becoming increasingly constrained due to restrictions to protect threatened fish species in the Sacramento-San Joaquin River Delta. With nearly 85% of the city's water supply coming from imported sources that are becoming increasingly scarce, conservation and local supply development have played a significant role in protecting our precious and limited water supply.

Historical Los Angeles Aqueduct Deliveries

6 x 100,000 Acre-Feet

Fiscal Year Ending June 30



LADWP is currently diverting 95,000 acre-feet per year from the LAA to Owens Lake for dust mitigation efforts, leaving behind enough to serve 190,000 households.

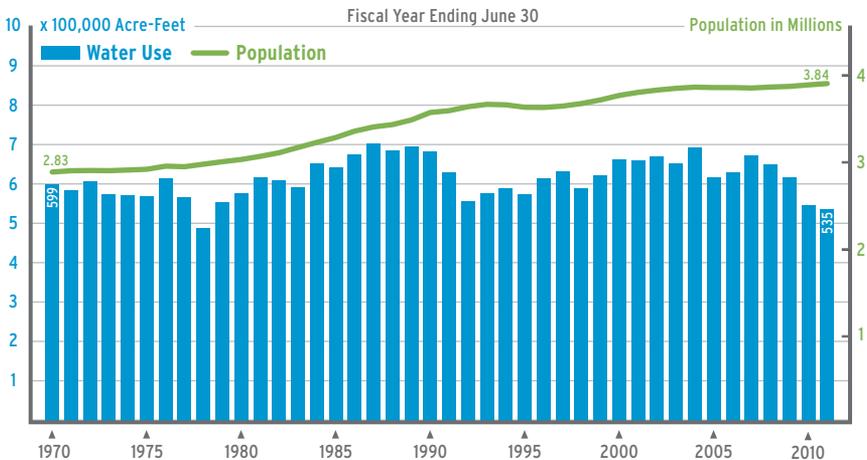
Water Conservation

Over the years, Angelenos have learned to do more with less, embracing a way of life that has enabled the city to become a national leader in water conservation. The installation of water-saving devices and acceptance of water-conserving behaviors have proven to be highly effective in the fight against water waste. LADWP has provided incentives for installation of more than 1.8 million water-saving showerheads, more than 1.27 million water-efficient toilets, and more than 80,000 high efficiency clothes washers in the city of Los Angeles. The water-saving toilets alone save Los Angeles more than 14 billion gallons of water each year.

In addition to rebates for the installation of water-efficient devices, LADWP offers financial incentives to commercial customers through the Technical Assistance Program for custom water-saving projects. Other efforts include water conservation information and educational programs and materials that teach and reinforce the importance of using water efficiently.

Understanding that water conservation is paramount to the sustainability of the city's water supplies, LADWP continues to follow through on the directives contained in the city's mandatory water conservation ordinance, in effect in Los Angeles since the early 1990s. An increased focus on outdoor water use, which accounts for about 40% of total water use, resulted in Los Angeles recording the lowest water use per person of any big city in the U.S. in 2011.

City of Los Angeles Water Demand and Population



Note: Population was updated with 2010 US Census data.



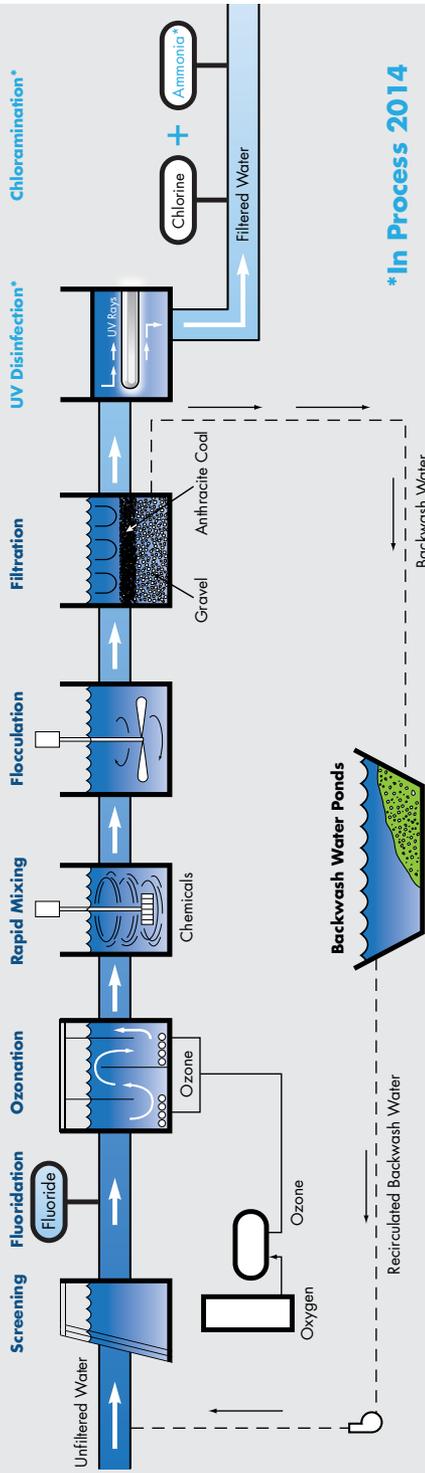


Water Quality

Protecting the safety of Los Angeles' water is LADWP's most fundamental responsibility as the city's water service provider. The safety of our drinking water is ensured through compliance with regulations established by the United States Environmental Protection Agency (USEPA) and the even more stringent standards imposed by the State of California Department of Public Health (CDPH).

Everyday, hundreds of LADWP employees work diligently to ensure that customers receive high-quality drinking water. LADWP achieves this by protecting its water sources, using state-of-the-art water treatment processes, prudently maintaining and operating its facilities, and providing vigilant security and monitoring. The extensive, citywide water sampling and testing program includes more than 300 specially installed sampling taps from which LADWP routinely collects over 25,000 samples every year. LADWP operates a first-rate, state-certified water quality laboratory that conducts approximately 250,000 water quality tests annually looking for more than 200 different regulated and unregulated constituents in the water supply.

The Water Treatment Process



*In Process 2014

Surface Water Treatment

LADWP's treatment capacity at the Los Angeles Aqueduct Filtration Plant (LAAFP) in Sylmar is 600 million gallons of water annually. The LAAFP treats water delivered from the LAA and the California Aqueduct. Water flows into the plant by gravity and undergoes several treatment processes that disinfect and remove impurities from the water.

In 2014, LADWP will add ultraviolet light (UV) treatment to the LAAFP treatment process. UV treatment produces fewer disinfection byproducts and will aid in achieving compliance with current and anticipated water quality regulations.

After providing treatment to clean the city's water supply, LADWP utilizes chlorine and chloramine as disinfectants to maintain the quality of the water as it travels through the city's pipelines.

Groundwater Treatment

The City of Los Angeles is located on top of a massive natural underground reservoir, located under the San Fernando Valley. Local groundwater is pumped, disinfected, and fluoridated prior to distribution to customers.

Because of industrial contaminants found in San Fernando Valley groundwater wells, LADWP continuously monitors groundwater wells and ensures that all well water served meets federal and state water quality standards. LADWP is formulating a comprehensive long-term groundwater treatment plan for the San Fernando Basin to extract and treat more water in order to safely increase the local groundwater supply.

WATER FOR THE FUTURE

Los Angeles' water needs will continue to steadily increase due to a growing population and expanding commerce. By the year 2035, the city's population is expected to grow to more than 4.4 million people and it is anticipated that water usage will be 232 billion gallons annually.

Four key priorities guide LADWP toward securing the future of LA's water: SAFETY, RELIABILITY, SUSTAINABILITY and COST-EFFECTIVENESS.

SAFETY: Regulatory Compliance

LADWP is committed to continuously meeting state and federal drinking water standards to provide high quality water and protect public health. As science and technology evolve, new and improved drinking water regulations are introduced to further improve water quality. These changes in the regulatory environment require major capital investments in LADWP's water infrastructure. Each regulation has a time-sensitive compliance mandate that must be met.

Water Quality Improvement Program

LADWP is constructing several water quality improvement projects. These projects are necessary to achieve compliance with more stringent water quality regulations. In essence, these new regulations will improve water quality by requiring additional protection of potable water supplies that emanate from open surface reservoirs (Long-Term 2 Enhanced Surface Water Treatment Rule), and reduction of disinfection byproducts in the water supply (Stage 2 Disinfection ByProducts Rule).

Open Reservoirs

To comply with the Long-Term 2 Enhanced Surface Water Treatment Rule, LADWP must cover, treat reservoir outflow, or remove existing in-city reservoirs from service. With ten of the system's original fifteen open reservoirs already in compliance, LADWP is in the planning or construction stage of a cover or replacement for the remaining open reservoirs.

Trunk Lines

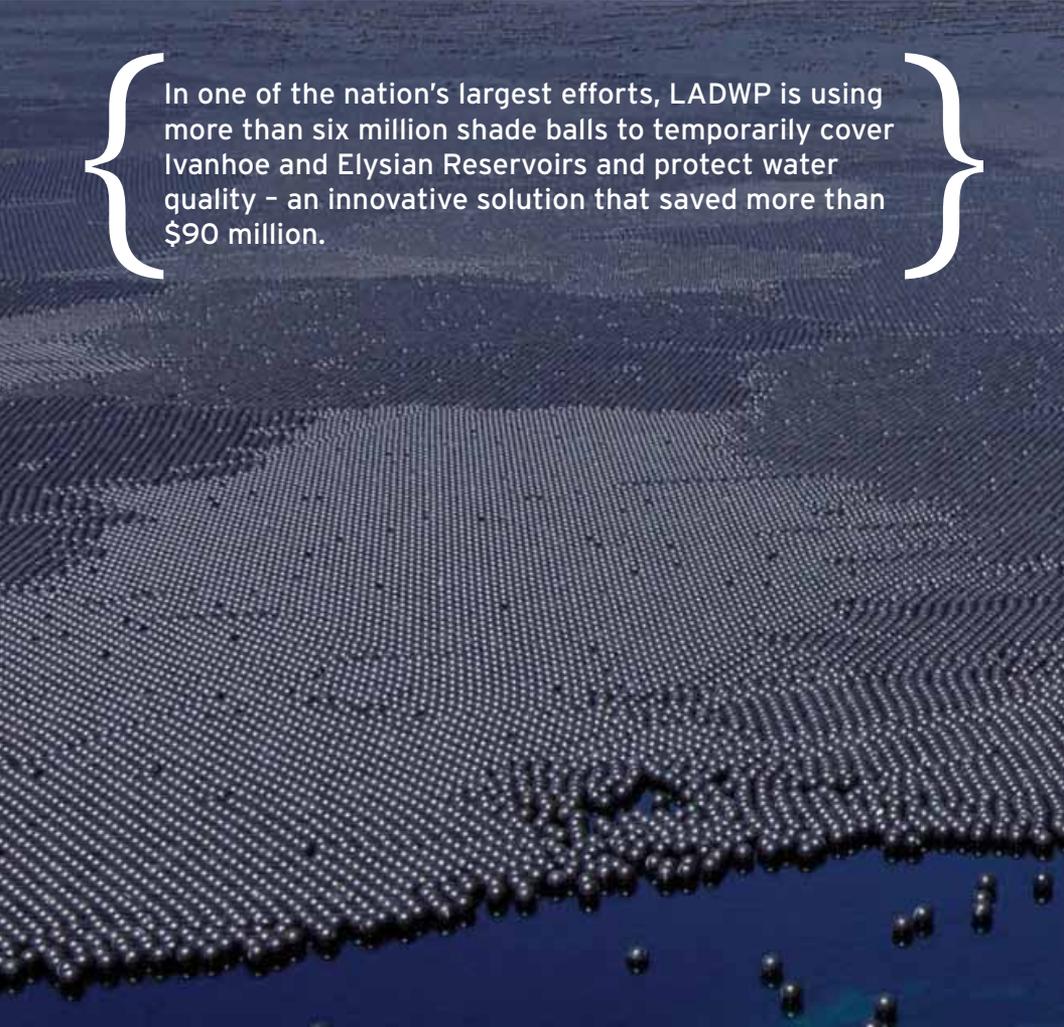
With some open reservoirs taken out of service and new underground reservoirs added, additional trunk lines are necessary to ensure that sufficient quantities of water can be moved from one area of the city to another, as needed. LADWP

is investing millions of dollars in several miles of new trunk line necessary to protect water quality, while keeping the water distribution system operating safely and reliably.

Chloramine

To comply with the Stage 2 Disinfection ByProducts Rule, LADWP is switching from chlorine to chloramine to disinfect its water supplies. Both chlorine and chloramine are effective killers of bacteria and other microorganisms, but chloramine forms fewer byproducts and does not have a chlorinous odor.

Chloramine is approved by the USEPA for use as a disinfectant for drinking water and has been used safely in the U.S. and Canada for many years. MWD has been supplying water treated with chloramine since 1985 to neighboring cities like Beverly Hills, Santa Monica, and Glendale.



In one of the nation's largest efforts, LADWP is using more than six million shade balls to temporarily cover Ivanhoe and Elysian Reservoirs and protect water quality - an innovative solution that saved more than \$90 million.

RELIABILITY: Infrastructure Upgrades

LADWP's water infrastructure is aging, and approximately two-thirds of the city's pipe infrastructure is now more than 50 years old. Maintaining the structural integrity of water delivery infrastructure is a high priority as LADWP strives to maintain reliable water service to customers.

Pipeline Replacement

In 2007, LADWP completed a cement-mortar lining program to extend the life of its existing pipes by 50 years. The aggressive program successfully lined a total of 1,970 miles of pipes, roughly equivalent to the distance from Los Angeles to Nashville, Tennessee. LADWP is currently underway with the Water Main Replacement Program to systematically replace the city's most vulnerable pipes. The new replacement pipes are intended to have a lifespan of 100 years or more.

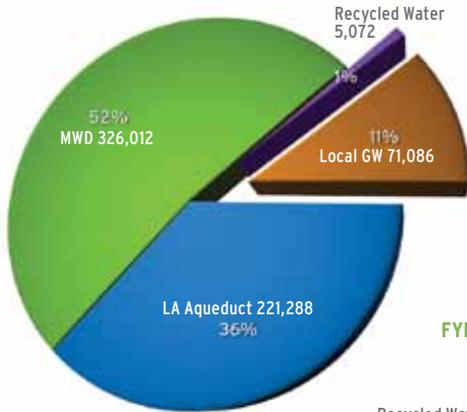


LADWP uses an asset management program to prioritize infrastructure replacement and rehabilitation of operating assets. Key prioritization factors include: age, operations and maintenance costs, soil conditions and other environmental factors, and criticality of each asset to the Water System. Through effective asset management and proactive maintenance practices, LADWP will maintain the structural integrity of water infrastructure and continue its reliable service for many years to come.

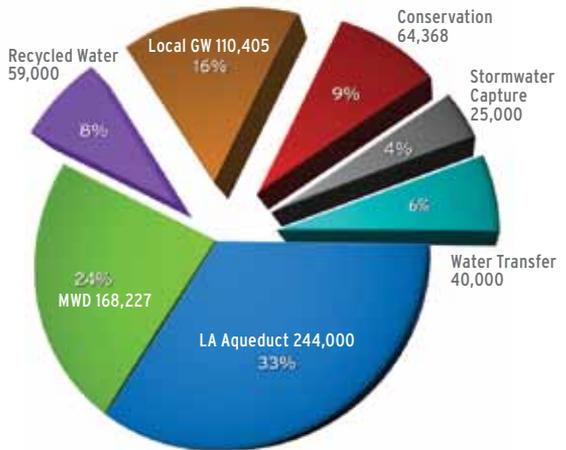
SUSTAINABILITY: Local Supply Development

LADWP is moving to meet the city's future demand for water by enhancing a diverse set of existing local water resources including conservation, recycling, groundwater clean-up, water transfer, and stormwater capture.

FYE 2006 - 2010 Average Total: 621,700 AFY



FYE 2034 - 2035 Average Total: 711,000 AFY



Note: Charts do not reflect 100,000 AF of existing conservation

Water Conservation

Water conservation is the cornerstone of LADWP's water resources management strategy. It helps ensure a sustainable long-term water supply while lessening the environmental impacts associated with the use of traditional water sources. A continued commitment to conservation will go a long way toward helping satisfy Los Angeles' future water needs.



Water Recycling

Water recycling is a feasible source of additional water supply for Los Angeles. The city has used recycled water since 1979 for irrigation and industrial purposes. To expand the use of recycled water, the LADWP has constructed a number of projects to develop a pipeline network to deliver recycled water to over 130 customers in and near Griffith Park, the San Fernando Valley, L.A. Harbor Area, and in the city's west side. Recycled water is also injected in the ground to prevent the ocean's sea water from migrating through the soil into the local water wells in the Harbor Area. In addition, we are pursuing groundwater recharge with advanced treated recycled water to replenish the San Fernando Groundwater Basin, a process proven successful in Orange and Los Angeles Counties over the past 25 years.

Stormwater Capture

During the rainfall season, millions of gallons of stormwater runs off into storm drains, collects in flood control channels, and flows out to the ocean. In undeveloped areas, much of the runoff is collected and seeps into the ground to replenish the groundwater. In most of Los Angeles, development and abundant hard pavement cover decrease the amount of open land that allows water to seep underground. To address this situation, LADWP is moving forward with a number of stormwater capture projects that would allow for enhanced capture of stormwater for groundwater recharge, thereby increasing groundwater supplies in the San Fernando Basin.

Groundwater Cleanup and Recovery

Groundwater is the primary source of local water supply for the city of Los Angeles, with the San Fernando Basin providing approximately 80% of the total local groundwater supply. In the past, groundwater supplied as much as 30% of the city's water supplies during drought years. Existing groundwater contamination in the San Fernando Basin has limited the availability of this valuable resource. Recognizing the urgency



and importance of this work, LADWP is working to expedite removal and cleanup of groundwater in the basin and provide treatment that will allow us to fully utilize local groundwater supply and storage capabilities. Efforts are also underway to develop stormwater capture projects that, in addition to the city's plans for groundwater recharge with recycled water, will increase the amount of groundwater available for recovery from our groundwater basins.

Groundwater cleanup and recovery in the San Fernando Basin is a massive undertaking that will transform one of the city's key water sources. The effort will require investment and commitment across the city, and LADWP will work to ensure that the San Fernando Basin remains a consistent, stable and reliable water resource for Los Angeles.

COST-EFFECTIVENESS

The LADWP Water System continues to take prudent steps to control costs through innovation, sound management of projects and assets, optimized operating and distribution system efficiency, and acquisition of outside funding to assist in financing major projects. As an example, LADWP innovation has resulted in pioneering the use of shade balls, and the future implementation of a large-scale ultraviolet (UV) light application for water disinfection as part of the water quality regulatory compliance efforts. This innovative approach will reduce the capital costs to our customers by nearly \$300 million. Additionally, about \$85 million in savings have been realized through successful acquisition of outside funding since 2005.

Maintain Competitive Rates

Costs continue to rise as LADWP works to comply with regulatory mandates, replace and rehabilitate an aging infrastructure, and develop new water resources to meet future needs. Despite these rising costs, LADWP is proud of its ability to keep rates comparably low among similarly situated, large water utilities in California. LADWP works hard to keep rates low to customers, and is committed to actions that will help meet this goal while delivering a safe and reliable water supply to Los Angeles.



Los Angeles  Department of Water & Power

LADWP Customer Service

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Water Quality Hotline

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www.ladwp.com

