

Water Recycling



Water is too valuable to be used just once

Water recycling extends our drinking water (potable) supplies, reduces wastewater disposal costs and lessens the impact of droughts. Recycled water projects also improve water quality and reduce pollution in the environment. Every gallon of recycled water used to irrigate crops or landscaping means a gallon of drinking water that can be used for potable purposes. Water recycling also helps to keep overall water rates low because it reduces the need to import more costly water from far-away sources like the Colorado River and the State Water Project. Recycled water makes up approximately 20 percent of Irvine Ranch Water District's total water supply.



The San Joaquin Reservoir can store up to one billion gallons of recycled water.

IRWD's tertiary wastewater treatment is an additional process that follows primary and secondary treatment processes. Tertiary treatment is a high level of treatment that results in excellent quality water that can be used again in the community for state-approved non-drinking water (non-potable) purposes.

Wastewater from the community is collected and treated to tertiary standards at the Michelson Water Reclamation Plant (MWRP), which has an 18 million gallons per day capacity, and at the Los Alisos Water Reclamation Plant (LAWRP), which has a 5.5 million gallons per day capacity. The capacity of the treatment plants will continue to grow along with the community.

Uses of recycled water

Recycled water is delivered throughout the IRWD service area through a dual distribution system in which the recycled (non-potable) water pipes are completely separate from the potable water pipes. The recycled system includes hundreds of mile of pipelines, and dozens of storage reservoirs and pump stations.

The primary uses of recycled water are landscape and agricultural irrigation. Landscape uses include parks, school grounds, golf courses, freeway landscaping and irrigation of common areas managed by many homeowner associations. Recycled water is also used for front and backyard irrigation in eligible residential lots, for toilet flushing and cooling towers in dozens of dual-plumbed office buildings and for industrial uses such as carpet dyeing and making concrete.

Row crops



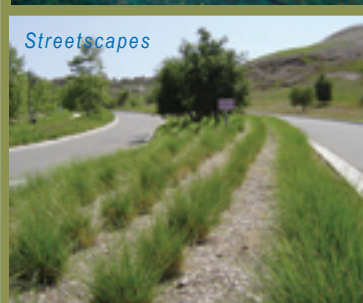
Community Lawns



Large landscapes



Streetscapes



Dual-plumbed office buildings



Water recycling: Following nature's lead

16 to 18 Hours is All it Takes

Recycled water production utilizes settling and biological treatment to duplicate nature's own cleaning processes. Wastewater is held in clarifying tanks, which use gravity to settle out biosolids for removal and further treatment. Then, naturally occurring microscopic organisms—the same ones found in ponds, streams and rivers—are introduced in order to consume the remaining organic matter from the wastewater. To speed up this cleaning process, air is added to the biological stage of the cleaning process so that a higher concentration of the organisms can do their work.

The cleaner water is then skimmed from the tanks and trickled through dual media filters that contain anthracite coal and sand. The filtration process mimics the way that groundwater is naturally cleaned as it percolates through layers of rock, gravel and sand. The final step in the process is disinfection, which kills any bacteria and viruses that may remain in the water. The entire recycling process is completed within 16-18 hours. Water from a resident's early morning shower will go through the recycling process and be available to water a golf course or park later that same night.

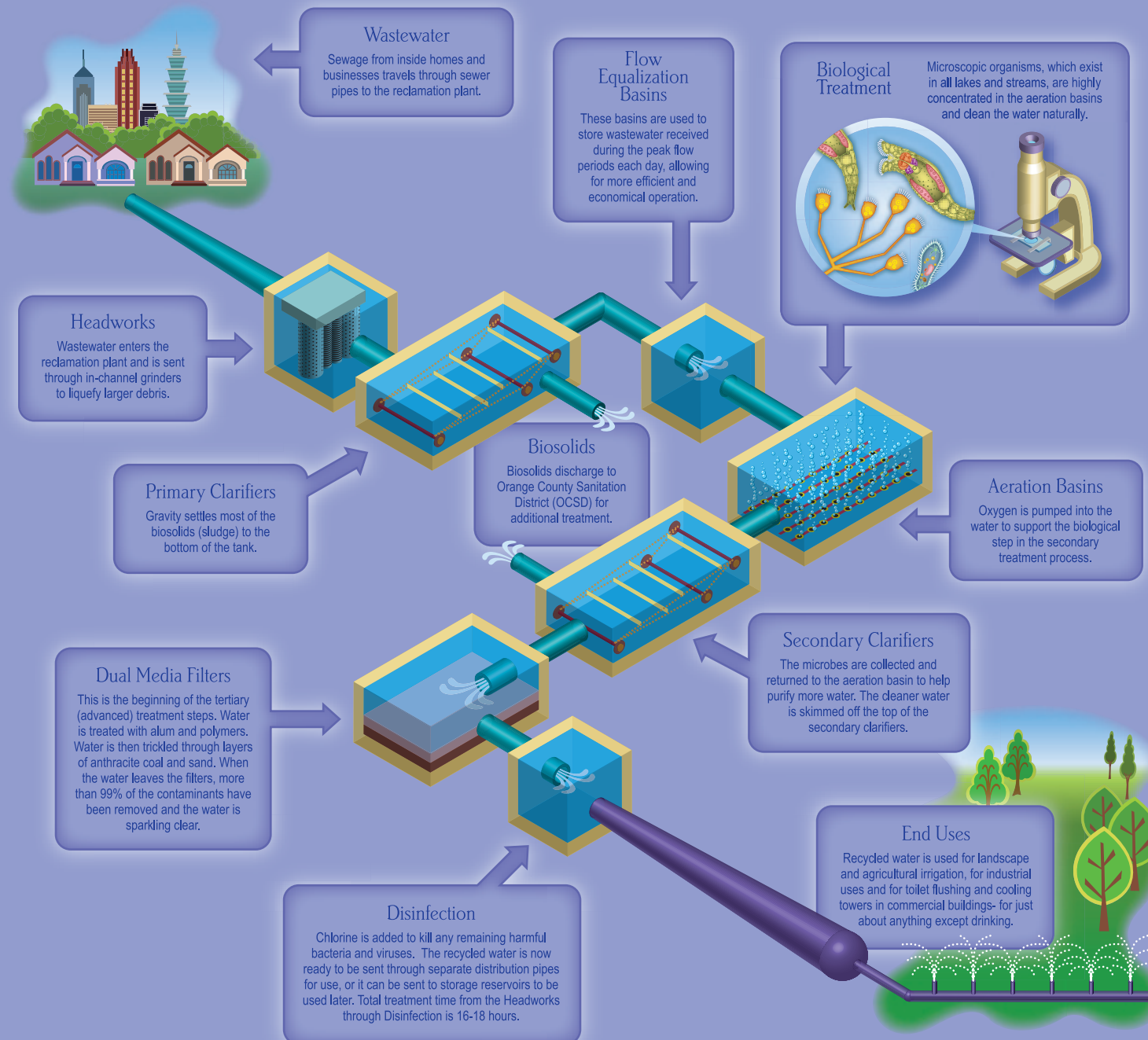
Quality is the Key

All recycled water produced at IRWD facilities meets, or exceeds, the stringent water quality requirements established by the California Department of Public Health. In California, these regulations for recycled water are spelled out in Title 22 of the California Code of Regulations.

The high quality of IRWD's recycled water earned the District the first unrestricted use permit in California in 1991. This designation allows the highly treated recycled water to be used for almost anything except drinking. As a result of that permit, IRWD became the first agency in California to be allowed to use recycled water inside commercial office buildings for toilet flushing.

IRWD maintains a State-certified laboratory to analyze every step in the recycling process. Samples are collected throughout the day for analysis and the results of these tests help treatment plant personnel evaluate and fine-tune the treatment process. IRWD's lab also monitors the recycled water distribution system and reports the results to the California Regional Water Quality Control Board, the California Department of Public Health and other regulatory agencies.

Michelson Water Reclamation Plant Treatment Process



Primary clarifiers allow most of the solids to settle out of the wastewater.

Aeration tanks contain microbes which work to decompose the organic materials in the wastewater.

Disinfection, the final step of the reclamation process, takes place in these chlorine contact tanks.

Steps in the Water Reclamation Process



Water Recycling designed into the community



One of California's most progressive water agencies, IRWD was formed in 1961 to provide drinking water and irrigation water for a growing community. In 1963 that scope was expanded to include sewage collection and treatment services. Forward thinking by the District's Board of Directors resulted in the integration of water recycling into the overall design of the community.

In 1967 IRWD's Michelson Water Reclamation Plant began delivering approximately two million gallons per day (mgd) of tertiary-treated recycled water to agricultural users. Over the years, IRWD's water recycling program grew from this limited use to a nationally-recognized program that provides recycled water for a variety of other non-drinking water uses. By 2008, the Michelson Plant's capacity had grown to 18 mgd.

IRWD also operates the Los Alisos Water Reclamation Plant in Lake Forest, which has a capacity of 5.5 million gallons per day. While the Los Alisos plant uses a different treatment system than the Michelson plant, both facilities produce high-quality, disinfected, tertiary-treated recycled water.



Within Irvine Ranch Water District's 179 square miles there are more than 4,000 recycled water connections. Currently, IRWD provides over 23.5 million gallons of recycled water per day.

Planning for the Future

The cornerstone of IRWD's extensive recycled water use has been the development of one of the largest dual distribution systems in the nation. Unlike some recycling projects that serve a limited number of customers, IRWD's recycled water distribution system reaches most of its 179-square-mile service area. Beneath most streets lie three pipelines – one for drinking water delivery, one for wastewater collection and a third purple pipe for the distribution of recycled water after treatment.

In fact, IRWD helped to pioneer the use of purple piping and signage as the international symbol for recycled water. This extensive distribution system continues to grow as the community is developed. IRWD has found that expanding the system as development occurs is more cost-effective than retrofitting, and leads to greater use of recycled water.

Irvine Ranch Water District's service area continues to grow, and the recycled water system will grow along with it. Engineers estimate that, when the service area reaches "final build out" in approximately 2025, a recycled water capacity of 33 million gallons per day will be required to meet demands. A master plan has already been completed to ensure that, together, the Michelson Plant and the Los Alisos Water Reclamation Plant will be able to treat that 33 million gallons per day.