
NATIONWIDE & INTERNATIONAL GROUNDWATER RECHARGE PROJECTS

Orange County, California

Orange County's Water Factory 21 was the first project in California to purify wastewater to drinking water standards as a barrier against the intrusion of seawater into a groundwater basin. Since 1976, Water Factory 21 has been protecting the integrity of the large groundwater basin that serves north and central Orange County, while also helping to increase the reliability of the area's water supply. Water Factory 21 has a design capacity of 15 million gallons of water per day (mgd). The water meets or surpasses all drinking water standards, even before it is blended with water from other supplies in the groundwater basin. After more than a quarter of a century of operation, Water Factory 21 has proven that highly treated wastewater can be successfully purified to drinking water quality and used for injection into groundwater basins.

www.gwrssystem.com

West Basin Municipal Water District, California

This water district uses microfiltration, reverse osmosis and ultraviolet light technologies to treat recycled water for groundwater injection. The West Basin Municipal Water District's wastewater purification facility in El Segundo, California, has been on-line since 1995.

West Basin uses a combination of imported water and purified wastewater for the one-half mile long seawater barrier that encompasses over 100 injection wells to help protect the District's productive groundwater basin from seawater intrusion. Currently 7.5 mgd of water that has been purified through a microfiltration and reverse osmosis process provides a high quality water that helps to improve the overall quality of the water mix in the groundwater basin that supplies the region's drinking water requirements.

www.westbasin.com

Los Angeles County, California

The Water Replenishment District of Southern California operates the Montebello Forebay Groundwater Recharge Project, one of the oldest ongoing natural groundwater recharge projects in the nation. WRD has managed the project, located in Los Angeles County, since 1962.

The Montebello Project filters an average of 45 million gallons per day of treated wastewater through the ground into the Los Angeles Central Groundwater Basin. Treated wastewater runs through dual media filters at the Montebello Forebay Groundwater Recharge Project and is discharged into the Rio Hondo River. This water is diverted to the groundwater basins. The recycled water constitutes an average of 18.7 percent of the groundwater supply.

<http://ladpw.org/wrd/publication/system/montebello.cfm>

Sanitation Districts of Los Angeles County

The Sanitation Districts of Los Angeles County utilize recycled water from three of their wastewater treatment plants for groundwater recharge. Below are descriptions of each plant:

The Whittier Narrows WRP was the first reclamation plant built by the Districts in 1962. It provides primary, secondary and tertiary treatment for 15 million gallons of wastewater per day (see flow diagram below). The plant serves a population of approximately 150,000 people. Virtually all of the purified water is reused as groundwater recharge into the Rio Hondo and San Gabriel Coastal Spreading Grounds or for irrigation at an adjacent nursery.

<http://www.lacsd.org/waswater/wrp/whittiernarrows.htm>

The San Jose Creek WRP provides primary, secondary and tertiary treatment for 100 million gallons of wastewater per day (see flow diagram below). The plant serves a largely residential population of approximately one million people. Approximately 35 million gallons per day of the purified water is reused at 17 different reuse sites. These include groundwater recharge and irrigation of parks, schools, and greenbelts.

<http://www.lacsd.org/waswater/wrp/sjc1.htm>

The Pomona WRP provides primary, secondary and tertiary treatment for 13 million gallons of wastewater per day. The plant serves a population of approximately 130,000 people. Approximately 8 million gallons per day of the purified water is reused at over 90 different reuse sites. These include irrigation of parks, schools, golf courses, landscaping and greenbelts, irrigation and dust control at the Spadra Landfill and industrial use by local paper manufacturers. The remainder of the purified water is put back into the San Jose Creek channel where it makes its way to the unlined portion of the San Gabriel River. Therefore, nearly 100 percent of the water is reused since most of the river water percolates into the groundwater.

<http://www.lacsd.org/waswater/wrp/pomona.htm>

San Bernardino County, California

The Inland Empire Utilities Agency's (IEUA) recycled water from one of their treatment plants is also currently used to recharge the Chino Basin aquifer at the rate of 500 AFY. The quantity of recycled water recharged in the Basin is scheduled to increase to 2,300 AFY in the future.

IEUA also supplies water to the Prado Regional Park Lake in southwestern San Bernardino County. The excess flow is being discharged to the Cucamonga Creek Flood Control channel and into the Santa Ana River.

www.ieua.org

Reno, Nevada

The Tahoe-Truckee Sanitation Agency Water Reclamation Plant combines conventional activated sludge secondary treatment with biological phosphorus removal to treat the wastewater. The treated water is released into the Truckee River, which is the source of the City of Reno's water supply.

www.ttsa.net or <http://63.150.38.132/jsp/index.jsp>

Las Vegas, Nevada

Since the 1950s, secondary treated wastewater has been discharged into the Las Vegas wash. The wash is located between the Las Vegas Valley and Lake Mead and represents two percent of the flow into Lake Mead. Lake Mead is the primary drinking water source for the Las Vegas Valley.

www.lvwd.com

El Paso, Texas

The Fred Harvey Water Reclamation Plant recovers and treats wastewater, which is then injected into the groundwater. The water eventually travels to one of El Paso's potable water fields to become part of the drinking water supply.

In 2004, a total of 577 million gallons of recycled water were returned to the Hueco Bolson aquifer.

http://www.epwu.org/wastewater/fred_hervey_reclamation.html

Scottsdale, Arizona

Since 1998, the Scottsdale, Arizona Water Campus has produced 12 mgd of tertiary treated wastewater that is used primarily for use on parks, medians and golf courses. In winter, when irrigation is reduced, 10 mgd undergoes advanced purification at a state-of-the-art membrane water purification facility where microfiltration and reverse osmosis purify the water to meet or surpass drinking water standards before it is used to recharge groundwater sources.

Water produced from the R.O. process will be used to recharge groundwater supplies, by injection into a series of dry wells. R.O. water will be injected into these wells, and the water will flow through an additional 500 feet of soil, known as the vadose zone, before reaching the natural water table. The combination of membrane and soil treatment will insure that there will be no degradation of the groundwater.

In 2006, the Water Campus recharged almost 6,000 acre-feet (1,955,106 gals) of recycled water and CAP water. Scottsdale will continue to expand the Water Campus and its recharge capacity. Scottsdale is also looking at innovative technologies to use some of our existing wells to put water back in the ground, instead of taking it out.

www.scottsdaleaz.gov

City of Peoria, Arizona

After the wastewater is highly treated to meet State of Arizona Department of Environmental Quality standards, the recycled water is sent to rapid infiltration basins on-site. As the water infiltrates downward it is treated again in a natural process called "soil-aquifer-treatment" prior to it reaching the groundwater table hundreds of feet below ground surface. The City of Peoria currently recharges 2,000 acre-feet a year from their Beardsley Water Reclamation Facility. This facility is permitted by Arizona Department of Water Resources as an Underground Storage Project. Peoria receives long-term storage credits from the Arizona Department of Water Resources.

<http://www.peoriaaz.com/Utilities/oldfiles/groundwaterrechargef.htm>

City of Glendale, Arizona

The newest type of water developed by Glendale is recycled water. Recycled water is water that has gone through the wastewater treatment process and is made safe to use again. Recycled water is being used directly on landscaping (such as at Arrowhead Ranch) and being stored in the aquifer.

Direct use of recycled water benefits the city by fulfilling a water demand that would otherwise be met using potable water. The normal rate of direct use of recycled water is usually needed even during droughts because of the lack of underground aquifer storage facilities.

<http://www.glendaleaz.com/utilities/watersources.cfm>

Fairfax, Virginia: Upper Occoquan Sewage Authority (UOSA), Millard H. Robbins, Jr. Water Reclamation Plant

Since UOSA came on-line in 1978 to replace 11 secondary wastewater treatment plants that were decommissioned, the quality of water in the Occoquan Reservoir has dramatically improved. The quality of the UOSA recycled water is generally much higher than that of the receiving stream. During times of normal precipitation, the UOSA Water Reclamation Plant effluent makes up about five percent of the total inflows to the Occoquan Reservoir. The Occoquan Reservoir is a major source of drinking water for Northern Virginia.

www.co.fairfax.va.us

NEWater Facilities in Singapore

To meet the burgeoning water demand of its 4.2 million people with limited land and diminishing water resources, Singapore's Public Utilities Board (PUB) looked beyond conventional answers to find creative and sustainable water supply solutions. Singapore designed a demonstration project and then "water reclamation" plants in Bedok and Kranji to produce potable water (NEWater) from recycled secondary effluent, subsequently a third NEWater plant in Seletar.

The latest ultrafiltration/microfiltration and reverse osmosis membrane technologies, followed by ultraviolet disinfection, treats used water to standards higher than the drinking water standards of the World Health Organization and the U.S. Environmental Protection Agency. Today, NEWater goes to high-tech industries requiring ultrapure water, and a small percentage is blended with reservoir water for drinking water supply purposes (about one percent of Singapore's drinking water supply). The project has been fully operational since 2003.

http://www.pub.gov.sg/NEWater_files/index.html

For more information contact:



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