



Monterey Peninsula Groundwater Replenishment Project

Providing A Safe And Sustainable Water Supply

ORANGE COUNTY WATER DISTRICT – LEADING THE WAY IN GROUNDWATER RECHARGE

Orange County, California: Water Factory 21

The most widely recognized and highly regarded water purification program in the water industry worldwide is Water Factory 21, a project built and operated by the Orange County Water District (OCWD).

It 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.

The project will help prevent predicted water shortages in the future. The first phase plans to produce approximately 72,000 acre-feet of water per year. The project can be expanded in future years. One acre-foot of water is 326,000 gallons or enough water to supply the needs of two Orange County families for a year.

The project will take tertiary-treated recycled water and treat it to beyond drinking water standards using advanced membrane purification facilities to be constructed in Fountain Valley. The water will be used to expand an existing underground seawater intrusion barrier. The water will be injected along the coast.

The Groundwater Replenishment System will provide a new drought-proof water source for north and central Orange County, reducing reliance on imported water. Additionally, the Groundwater Replenishment System will save additional funds in the future by improving the quality of the water in the Orange County groundwater basin. This water quality improvement takes place when the new purified water, low in minerals, mixes with existing groundwater, lowering the average mineral content of Orange County's water. Lowering the amount of minerals in the water or reducing water hardness will decrease maintenance costs for Orange County's residents and businesses by extending the life of water heaters, boilers, cooling towers and plumbing fixtures.

State-of-the Art-Technology

The previously treated recycled water will undergo an advanced treatment process that includes two membrane filtration systems - microfiltration and reverse osmosis disinfection and treatment by ultraviolet light and hydrogen peroxide. Once purified, the water will be sent to recharge facilities or injection wells. The newly purified water will seep into the ground, like rain, and blend with groundwater.

Recharge Program

The Orange County Water District is responsible for managing the underground water reserves that supply about 500 wells within district boundaries. At the present time about 270,000 acre-feet of this water is pumped for use each year. That quantity grows steadily, and projections indicate the demand may reach 450,000 acre-feet a year in the next quarter century. (One acre-foot of water, which would cover a football field to a depth of twelve inches, would supply two average families for a full year.)

Groundwater reserves are maintained by a recharge system, which replaces water that is pumped from wells. Along a six-mile section of the Santa Ana River that belongs to OCWD, a system of diversion structures and recharge basins captures most of the water that would otherwise flow into the Pacific Ocean. The district has 1,500 acres of land for use in its recharge program.

Water that flows down the Santa Ana River, together with supplies imported from the Colorado River and from the State Water Project, is channeled into nine recharge basins. These lakes and ponds, with depths ranging from 50 to 150 feet, were formed in years past by sand and gravel mining operations.

Prado Dam Wetlands

The Orange County Water District owns 2,150 acres behind Prado Dam in Riverside County, California. Within OCWD property and adjacent lands are nearly 465 acres of constructed wetlands, which have effectively demonstrated the ability to reduce nitrogen levels in Santa Ana River water. The Santa Ana River is the main source of recharge for the vast Orange County groundwater basin, and consists primarily of tertiary treated recycled water from upstream dischargers. The river also receives storm flows, natural run-off, and rising groundwater, especially during winter months.

The wetland consists of a system of 50 shallow ponds that have been utilized to remove nitrogen in river water since July 1992. The wetland system removes approximately 20 tons of nitrate a month, and during summer months reduces nitrate concentration from 10 milligrams per liter to less than 1 milligram per liter. Several modifications have been made to increase the hydraulic capacity of the Prado wetland pond system, in order to handle a potential increase in future baseflows from the Santa Ana River, and to improve the operational flexibility of the system.

Prado Dam is a key component for increasing local water supplies in Orange County. Historically, storm flows from the Santa Ana River have been lost to the ocean because flood control took precedence over water conservation. However, a series of agreements between Orange County Water District, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service have allowed the District to conserve water behind the dam in a seasonal storage pool.

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