



Monterey Peninsula Groundwater Replenishment Project

Providing A Safe And Sustainable Water Supply

ORANGE COUNTY: LEADING THE WAY IN GROUNDWATER RECHARGE

Orange County, California: Groundwater Replenishment System

The largest, most widely recognized and highly regarded water purification program in the water industry worldwide is a joint project of the Orange County Water District (OCWD) and Orange County Sanitation District (OCSA).

This project was the first in California to purify wastewater to drinking water standards as a barrier against intrusion seawater into a groundwater basin. Since 1976, the Groundwater Replenishment System (GWRS) 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.

Currently producing up to 70 million gallons of new purified water a day, the GWRS has just been approved to expand its system to create 100 million gallons per day, or an additional 31,000 acre feet per year (a total of 72,000 AFY) of new water supplies. Scheduled to be completed in September 2014, the total production of the newly expanded project will produce enough water for 850,000 people.

The GWRS provides a drought-proof water source for north and central Orange County, reducing reliance on imported water, reducing the amount of wastewater discharged to the Pacific Ocean, and prevents seawater intrusion into the groundwater basin. The new water produced by the GWRS requires just one-half the energy currently required to import water to the Orange County region. Additionally, the GWRS 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, which is 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, thus 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 project takes highly treated wastewater and purifies it to beyond drinking water standards using a three-step process that includes microfiltration, reverse osmosis, and oxidation with ultraviolet light with hydrogen peroxide. Once purified, the water is sent to recharge facilities or injection wells. The newly purified water is injected into the groundwater basin and blended with existing groundwater supplies.

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, provides enough water for four average families for a full year.)

Groundwater reserves are maintained by an aquifer 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 wetlands consist of a system of 50 shallow ponds that have been utilized to remove nitrogen in river water since July 1992. The wetlands system removes approximately 20 tons of nitrates 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 base flows 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.

For more information contact:



Monterey Regional Water Pollution Control Agency

Mailing Address: 5 Harris Court, Building D, Monterey, CA 93940 • Phone: (831) 372-3367 or (831) 422-1001

www.mrwPCA.com • www.mpwaterreplenishment.org