WATER MATCH

CH2MHILL

Water Reuse Case History

Redlands Water Recycling/Power Generation Reuse Project

Redlands, California, USA

Municipality: City of Redlands

Company: Mountainview Power Company

Project Fast Facts

Flowrate: 4,166 gpm (946 m^3/hr)

Industry: Power

Use: Cooling and Process Water

Conveyance: Underground Pipeline

The semi-arid City of Redlands is located about 50 miles (80 km) east of Los Angeles, California. The nearby 1,056-megawatt Mountainview Power Company (MPC) was planning to use a series of large wells for cooling water that would place a strain on the region's future groundwater supply. To conserve its precious supplies, the City advocated for recycled water to supply the cooling towers using an advanced treatment technology, known as a membrane bioreactor (MBR), to provide the necessary high-quality cooling water in an environmentally and economically better way.

The City of Redlands reached an agreement with MPC to provide 6,000 acre-feet per year (AFY) of recycled water for the cooling towers that meets state of California Title 22 requirements. A treatment alternative feasibility study was conducted to select a treatment alternative that would provide the desired water quality for identified reuse options and also lend itself for easy retrofit or expansion in the future. The study concluded that use of membrane technology was the preferred treatment option.

CH2M HILL, as part of a design team, helped plan and design the water recycling treatment facilities. Several unique and challenging features of the project included stringent water quality requirements, a highly compressed schedule, and the large-scale use of MBR technology. In addition to the cooling water supply needs, the facility also produces discharge quality effluent. As such, the conventional activated sludge (CAS) treatment system at the existing plant was maintained as a separate train to produce 3 mgd effluent.

The MBR treatment train was designed for a 6 mgd and 6.6 mgd average and peak daily flow, respectively. The design was based on GE Zenon MBR system, which was chosen because of its ability to fit the constrained footprint while providing high-quality product water for the cooling towers. The facility was recently expanded to produce 9 mgd product water to meet MPC's increasing recycled water needs. The facility contains sidestream drum screens and screenings compactors for processing a fraction of the mixed liquor recycle flow, rather than treating the entire flow. The MBR design also includes scum removal pumps and tank overflow provisions. As a result of value engineering, the in-line UV disinfection system was replaced with sodium hypochlorite disinfection—providing substantial cost savings of about $1 million to the City.

This project earned the California Water Environment Association and Santa Ana River Basin Section Engineering Achievement Awards for innovative applications in wastewater treatment.

Our motive is simple: to promote beneficial wastewater reuse around the world today.
Join us and help make matches happen. Because no water should be wasted.