



The view from Charles A. Strain Water Treatment Plant, near Grand Junction, Colo. Burns & McDonnell and Garney Construction designed and built a 16-MGD pretreatment facility for the Clifton Water District that treats the Colorado River water that area residents use.

How the West Was Won

Growing Region, Aging Infrastructure Lead to Demand for New Water Facilities

The Clifton Water District perhaps best demonstrates the water issues faced in Colorado and other western states.

The district, located near Grand Junction, Colo., gets its water from the Colorado River. As river water goes, the upper Colorado is pretty clean. But when storms strike nearby, clean can become murky quickly.

“Our staff can pretty much tell where the latest thunderstorm was centered just by looking at the color of our influent,” says Dale Tooker, district manager. “Our raw water supply routinely has high levels of turbidity.”

Rapid population growth, aging infrastructure and tighter water regulations are combining to make fresh water an increasingly hot property for Clifton and other cities across the west. Firms like Burns & McDonnell are bringing design, construction, finance and planning solutions that help bring utilities to the river, so to speak.

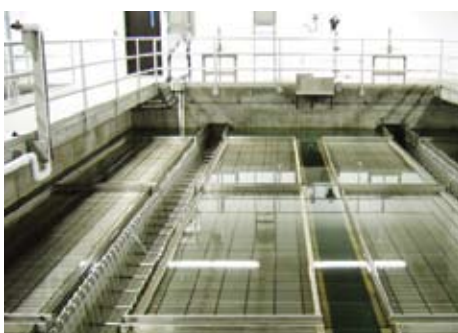
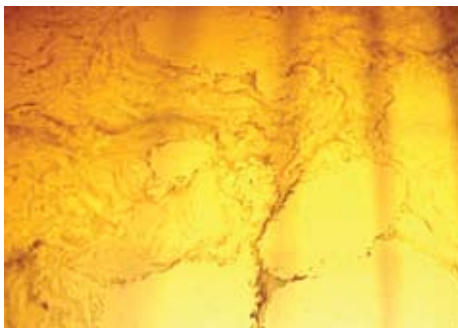
The Technology of Treatment

Burns & McDonnell and Garney Construction designed and built a pretreatment system to solve Clifton’s water issues. The facility consists of two chemical coagulant storage and feed systems that monitor changes in influent water quality and automatically adjust the

amount of coagulant needed. This technology is important for treating raw water of such varying quality.

“The coagulation and sedimentation processes in the plant are so effective that the pretreated water entering the plant for filtering already meets the EPA standard for turbidity,” says Mark Lichtwardt, project manager.

Technology, particularly membrane technology, has been critical for cities dealing with water quality issues. Membranes create an effective barrier against turbidity, waterborne bacteria (*E. coli*) and pathogens



Sediment-laden Colorado River water (top) is brought into the Clifton pretreatment facility (middle and bottom) where it is treated using a series of advanced techniques.

(*Cryptosporidium* and *Giardia*). In addition to their effectiveness, membrane systems are also fully automated and have come down in cost in recent years, making them increasingly popular.

Burns & McDonnell used membranes in the Wes Brown Water Treatment Plant in Thornton, Colo. To select the right fit, the firm pilot tested five membrane systems. The intense pretesting and subsequent competitive evaluation helped Thornton get the membranes and associated equipment at a savings of more than \$6 million compared with the city's anticipated cost.

For that value, Thornton received a plant designed with a secondary treatment system that allows 99 percent of the water that enters the plant to be recovered and used



Membrane technology, which is used in the Wes Brown Water Treatment Plant in Thornton, Colo., is becoming a more popular treatment technique as costs decline.

by customers. This highly efficient process saved Thornton almost 300,000 gallons of water in 2006.

"Burns & McDonnell worked with the city to implement the latest water treatment technologies that are optimized to provide the best value for the city," says Bud Hart, water supply, treatment and quality manager at the Wes Brown plant. "This will pay dividends for Thornton residents for many years through better water quality and a more efficiently operated plant."

Paying for It

Rising costs for construction and water rights are making the financing of new and modified plants increasingly important for utilities.

"Operating and capital costs are the two major cost factors for water utilities," says Ted Kelly, Burns & McDonnell finance expert. "A well-done rate study can make the difference in whether a project goes forward."

Rate studies help determine how much of a plant will be paid for by the plant's users through their utility bills. Once costs for the plant are determined, several other factors need to be considered in completing a rate study and proposing new rates, including how many of the users are considered low-income,

how much the community is expected to grow and what other funding is available.

"We've been able to offset some of the cost for a new plant simply by finding out what sort of funds are available from the state," Kelly says. Burns & McDonnell helped the city of Lander, Wyo., secure \$12 million in funding for its new water treatment plant, which included more than \$6 million in grants. The plant was expanded from 5 million to 8 million gallons per day and uses both conventional and cutting-edge treatment techniques.

Kelly's goal for each client is to have a rate plan that is "sellable" to governing bodies and the system's users. For a water project in Glenwood Springs, Colo., Kelly devised a plan that gradually phased in higher rates, making the rate increases easier for users to absorb. At the same time, construction of the project was delayed while a reserve fund accumulated to offset the cost of the project.

"When it came time to begin the project, the cost impact was not as dramatic for the city or the rate payers."

For more information, contact Mark Lichtwardt, (303) 721-9292.



Please visit www.burnsmcd.com/westernwater for descriptions of Burns & McDonnell projects that are improving the quality of life for residents in western U.S. communities.