



An eight train constant flow FiberFlex™,  
the largest UF open platform design of its kind

**APPLICATION:** Municipal Drinking Water

**CAPACITY:** 45 420 m<sup>3</sup>/d (12 MGD / 45 MLD)

**LOCATION:** Clifton, Colorado, USA

**COMMISSIONED:** June 2015

## CHALLENGE

The Clifton Water District (CWD) operates the Charles A. Strain WTP which uses the Colorado River as its primary raw water source. The WTP was originally constructed in the late 1970's as an 8 MGD conventional filtration plant with coagulation, flocculation, sedimentation using tube settlers, and sand filtration. The plant was expanded in the early 1980s to a design capacity of 12 MGD. In 2007, a new 16 MGD pretreatment facility was built. As it operates today, the pretreatment facility includes coagulant addition, flocculation, sedimentation with lamella plate settlers and chemical feed systems.

As part of the current project, the Clifton Water District was faced with the challenge of replacing its dated sand filters to meet the more stringent drinking water regulations and due to seasonal demand requirements, the retrofit of the plant had to be completed within a very tight implementation schedule.

## SOLUTION

H2O Innovation partnered with the Carollo Design Build Group and PCL Construction to deliver a state-of-the-art, open platform ultrafiltration (UF) membrane system. This was a fast-tracked project that successfully realized a make water date that was less than 12 months away from issuance of Purchase Order for the design, manufacturing and commissioning of an eight-train membrane system.

The facility was retrofitted by eliminating the old sand filtration basins and installing eight UF trains, each rated for 2 MGD of production capacity. To ensure a smooth flow profile through the pre and post-treatment operations, the membrane system was designed to facilitate constant production flow using a N-2 configuration.

The project involved several engineering and delivery challenges. The construction of the new system had to be scheduled within the operating facility to coincide with the winter months, as the water flows were lower at this time of year.



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### BUILT WITH FIBERFLEX™

Despite not having piloted, the owner and design build team clearly recognized the value of a FiberFlex™ solution and selected H2O Innovation as the preferred system supplier. The Clifton FiberFlex™ was the largest open platform UF system of its kind. The open platform system allows the customer to change membrane suppliers, allowing for a flexibility that isn't offered by other UF/MF equipment suppliers. This project marked a new generation of membrane racks offering owners and engineers the option to choose from a wide variety of membrane products available in the present-day and future markets.

The supporting ancillary equipment was designed and selected to accommodate various operating conditions from future membrane replacement modules such as air scour rates, backpulse flows, system cleaning volumes and various chemical recipes. No additional programming is required when modules are swapped out in the future. Operational parameters for future membrane modules are simply changed by the operator at the HMI.



### RESULTS

The UF system was commissioned on schedule and started producing water in mid June 2015. The plant uses H2O Innovation's Intellogx™ to monitor and track membrane system performance. Intellogx™ provides the operators a remote access tool for monitoring the various unit operations of the UF trains including TMP and fouling rates, flux and production flow, membrane permeability, feed and filtrate water qualities and much more. The Intellogx™ tool serves as a lens into the real-time performance of the UF, allowing operators to fully optimize cleaning operations to suit different system demands and variable feed conditions.

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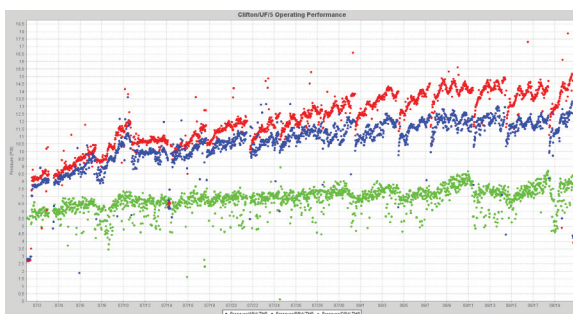


Fig. A4 | T5 - TMP

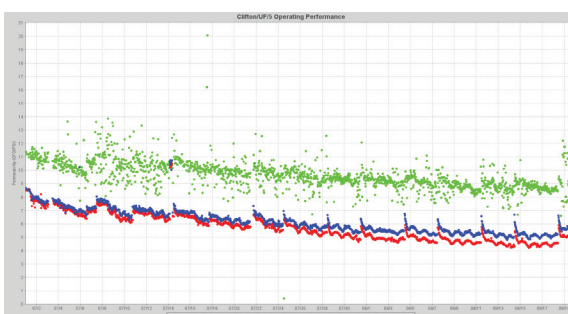


Fig. A6 | T5 - TC perm. 20 °C