

UF Handles Spring Snowmelt, Future Growth

AltaPac™ Ultrafiltration System

CASE STUDY

Location: Dutch John, UT
Owner: Greendale Water Company
Engineer: Sunrise Engineering
Contractor: Ellsworth Paulsen Construction

Problem

The Greendale Water Company services the small area in and around Flaming Gorge National Recreation Area. Their customers include the Greendale community, the Flaming Gorge resort and campground, and other seasonal businesses. Previously, water was treated from their spring water sources using small pressurized media filters. These filters required extensive maintenance, weren't supported by their manufacturer, and were challenged to produce effluent meeting drinking water standards during the spring snowmelt and subsequent high-turbidity events. In addition to these issues, the plant needed additional capacity to accommodate growth in the area.

Analysis of Alternatives

New media filtration equipment, microfiltration, and ultrafiltration were all considered for the upgrade. When choosing the best technology, Sunrise Engineering and the Greendale Water Company weighted both performance and limited operator involvement heavily. At this plant, the plant operator also serves as the county chief deputy and in

several other functions, so he had minimal time to operate the plant and requested remote access from his laptop and cell phone. Full system redundancy, fast pilot deployment, and the ability to double the plant's capacity by simply adding additional modules were also of high importance.

Recommended Solution

WesTech's AltaPac™ Ultrafiltration Membrane Package System was ultimately selected for this plant upgrade for multiple reasons:

- The engineer determined that the pore size of ultrafiltration membranes would be preferable to microfiltration, since the spring snowmelt produces an extremely fine silt in the feed water which could potentially cause the microfiltration membranes to foul fast.
- The automation and remote monitoring capabilities built into the AltaPac system allowed the operator to control the plant remotely and minimized plant maintenance.



The compact and efficient design of the AltaPac limited the costs of installation and construction of the new treatment building.

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- The AltaPac could be partially populated with modules, but the pumps and other appurtenances were sized for the full flow rate, allowing for easy expansion through installation of additional modules.
- The integral CIP skid and compact design of the AltaPac offered significant savings on building and construction costs.
- WesTech's main PLC panel could be used as the plant's Supervisory Control and Data Acquisition Systems (SCADA) system, negating the need for additional control panels.



An optional neutralization system was included with this equipment to allow for discharge of chemical solutions used during membrane cleaning.

Implementation

Following the selection of ultrafiltration as the technology of choice, WesTech competed against four other membrane suppliers in the direct bid, and was selected to provide the equipment and immediately start the state-required pilot study. The pilot study was performed for 3.5 months, and the membrane

was exposed to the full range of feed turbidity. The pilot study investigated a variety of operating conditions, and WesTech assisted with a coagulant study and a disinfection byproduct formation potential study – the results of which were integrated into the plant's design. After completion of the pilot study and approval by the state, WesTech's equipment was fabricated and ready for delivery well ahead of schedule.

Results

The ultrafiltration system has been operating successfully since the start-up in January 2016. The operator and owners have been pleased with the ease of use, reliability, and high quality filtrate achieved using the AltaPac ultrafiltration system. In addition, the customer has been extremely impressed by the dedication to service and support demonstrated by all WesTech employees involved with this project. In fact, the use of ultrafiltration at the plant has been such a success that it has inspired visits by other engineers looking to overcome similar challenges.



Only half the ultrafiltration racks are populated due to current demand. The capacity of the system can be doubled quickly and inexpensively by installing additional modules. All system components are sized for the increased capacity to limit costs associated with expanding the system.



AltaPac systems are assembled and tested in WesTech facilities to ensure quality and consistency.