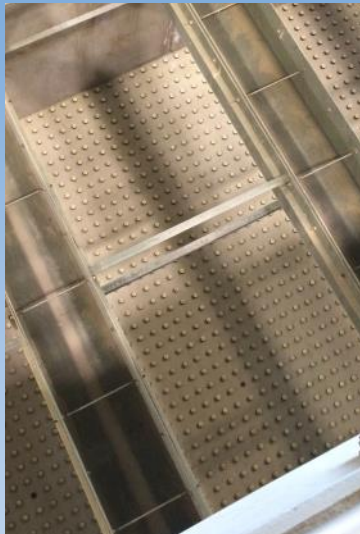


## Proven, Higher Filtration Flowrates Saves \$Millions on WTP Project

### Designed 10 GPM/ft<sup>2</sup> Cuts Biological Filter Sizing in Half

#### Success Highlights:

- \$8MM saved due to increased flow rate
- Ozonation with Biological Filtration for reduced DBPs
- Structurally-superior underdrain continues to provide repeatable results
- 50 MGD capacity
- 4,416 square feet total
- Carollo — Designer



Bailey WTP Filter Underdrain

*Poseidon Filtration Systems™ deliver to municipal clientele complete systems that include PLC-based controls, monolithic floor underdrains, backwash troughs, air header piping, and filtration media.*



November 22, 2016 -- Orthos Liquid Systems, Inc., (Orthos) the leading manufacturer of nozzle-based filter underdrain systems in water/wastewater treatment, helped save Colorado Springs Utilities (CSU) nearly \$8MM through proof of doubling the biological filter flowrate at the Edward W. Bailey Water Treatment Plant (WTP) in El Paso County, CO. Early in plant design, pilot testing proved the plant could achieve a filtration rate of 12 GPM/ft<sup>2</sup>, more than double the state regulation standard rate for water treatment.

CSU celebrated in April 2016 the commissioning of the \$125MM E.W. Bailey WTP, as part of the \$1.45B Southern Delivery System (SDS) water delivery project that will meet regional needs through 2040. The SDS delivers Arkansas River water, stored in the Pueblo Reservoir, to nearly half a million people in Colorado Springs, West Metropolitan District, City of Fountain, and Security Water District.

#### PROCESS

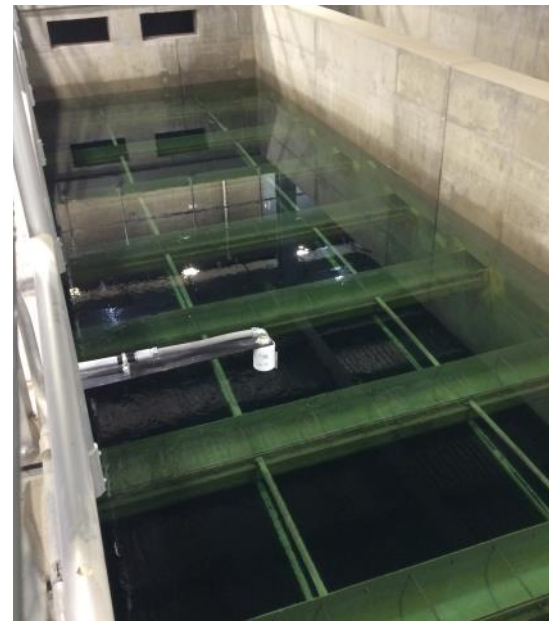
The 82,000 ft<sup>2</sup> facility may currently treat up to 50 MGD. Water treatment at the Bailey WTP involves traditional processes of flocculation and sedimentation along with ozonation and biological filtration to address turbidity, pathogen removal, taste, and odor issues.

Biological filtration uses granular activated carbon to remove organics, filterable solids, and micropollutants. Ozonation prior to filtration converts total organic carbon to biodegradable dissolved organic carbon, which microbes growing on the media may consume. Final disinfection using chlorine results in significantly less harmful byproducts due to the reduction of organics by the biological filters.

#### SAVINGS

Upon approval of the designed 10 GPM/ft<sup>2</sup> filtration rate, CSU installed fewer filters, reducing the plant's cost by nearly \$8MM. Six downflow filters utilizing Orthos' nozzle-based monolithic underdrains each measure 46' x 16'. Filtration media include 12" of ±0.6 mm sand and 72" of ±1.4 mm anthracite. Finished water consistently meets or exceeds applicable regulations.

"The water treatment industry is increasingly utilizing biological filtration," said Tim Baumgartner, Orthos Head Engineer. "Our nozzle-based underdrains allow for cost-cutting, higher filtration rates, while providing reliability and resiliency unmatched by block or folded-plate designs. We look forward to being a significant part of the advancement of water treatment."



Bailey WTP Biological Filter