

Longevity and Effective Turbidity Removal in California

Trident® Packaged Water Treatment Plant Excels in Limited Space



CASE STUDY

Location: El Dorado Hills, California
Owner: El Dorado Hills Irrigation District

Problem

Established in 1925, El Dorado Hills Irrigation District (EID) serves approximately 128,000 residents in California's El Dorado County via three water treatment plants (WTPs). The El Dorado Hills WTP is the EID's main water treatment system. This plant, which treats surface water drawn from Folsom Lake, has a service area that runs from El Dorado Hills to Pollock Pines and provides water to over 41,000 account holders. Faced with continuously rising demands for clean water from this WTP, the EID sought to expand the plant's treatment capacity by replacing equipment originally installed in 1960. Finding a solution that could fit within the plant's extremely limited space and still deliver the increased capacity it needed proved to be a challenge.

Solution:

After much deliberation, EID selected [Trident®](#) technology (WesTech Engineering, LLC) for its small footprint and higher flow rates per unit area. The Trident is a two-stage treatment

system. The first stage provides clarification via an Adsorption Clarifier® and the second provides filtration via a mixed-media filter.

The Trident is designed to replace conventional treatment systems that use flocculation, settling, and filtration in a smaller footprint. With the Trident process, proper chemicals (typically a

coagulant and flocculant-aid polymer) are fed ahead of the unit. The treated water then flows into the bottom of the Adsorption Clarifier, which is the first stage. The water flows upward, snaking a tortuous path through the buoyant media that provides flocculation. A media retention screen prevents media loss.



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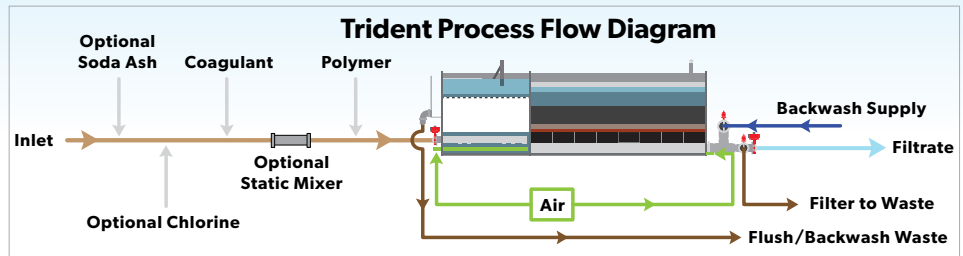
WESTECH®

The floc that this process produces is captured within the void spaces of the media or adsorbed onto it. It does not settle. The Adsorption Clarifier typically removes 70-90 percent of inlet turbidity.

The clarifier effluent then flows into a 30-inch mixed media filter bed consisting of layered anthracite, sand, and high-density sand. The media polishes the water, producing high-quality effluent that typically contains less than 0.1 NTU. (See the process flow diagram.)

Implementation:

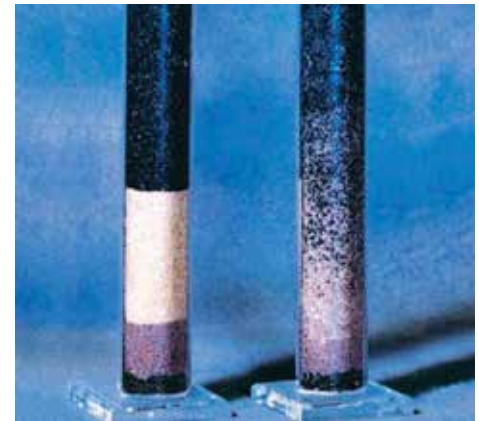
The plant installed two Trident units (TR-840 Model) in 1993, each of which treated 2 MGD (7.6 MI/d). EID installed two additional units at the plant in 1995 to meet increased water demands.



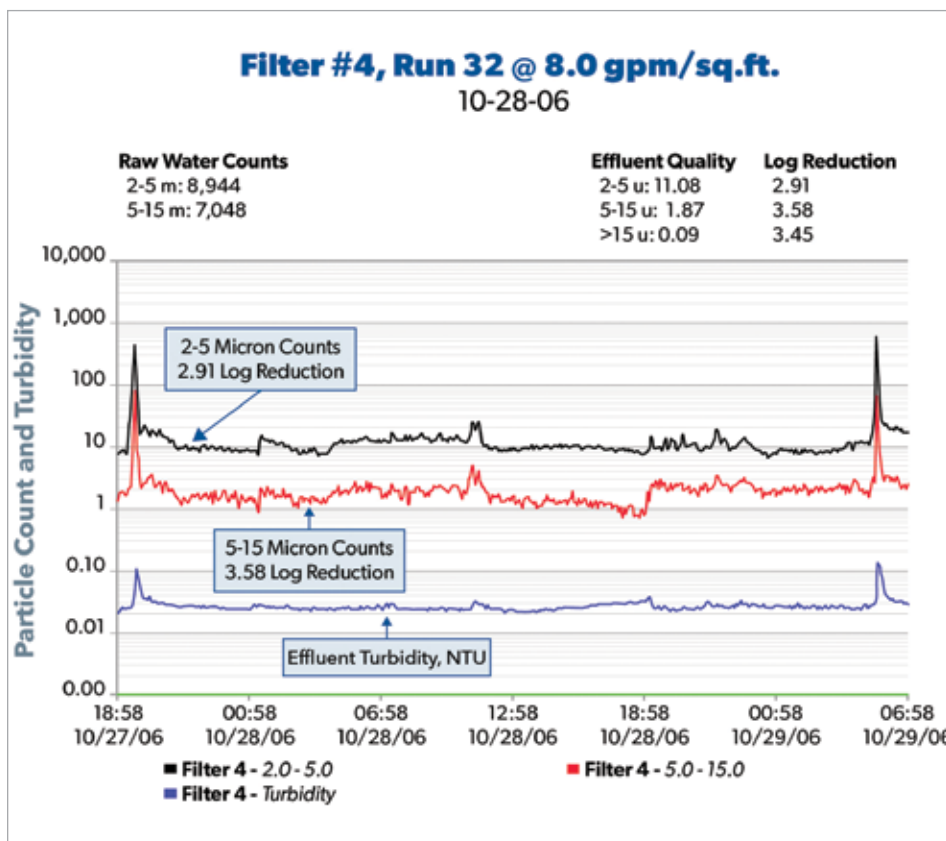
The Trident provides flocculation, clarification, and filtration within a single tank.



In the first stage, water flows upward through buoyant media, which provides flocculation.



Trident units typically provide 2.9 log removal of cryptosporidium and 3.5 log removal of giardia-sized particles.



The Trident units regularly produce an effluent that is below 0.03 NTU.

Results:

Combined, the four Trident units produce 8 MGD (30 MI/d) of clean water for county residents. Plant data show the Trident units typically produce an effluent turbidity that is below 0.03 NTU, with 2.9 log removal of cryptosporidium-sized particles and 3.5 log removal of giardia-sized particles. (See the chart.)

Plant operators have been very pleased with the Trident system's performance over more than 25 years of operation. Bill Peterson, the plant's chief operator has expressed a clear preference for Trident technology over conventional treatment.