IDE'S MUNICIPAL WASTEWATER REUSE SOLUTIONS

SAFER, BETTER WATER

IDE Technologies | Your Water Partners

PFRO™ - PULSE FLOW RO

IDE's PFRO™ offers a chloramine-free process for producing high quality potable water from wastewater. As with the FAT process, feed water goes through the same three basic treatment stages: UF/MF, RO and UV/AOP - only this time with a twist during the RO stage:
RO works in a non-continuous flow mode called Pulse Flow, which allows higher recovery while reducing scaling and fouling potential.

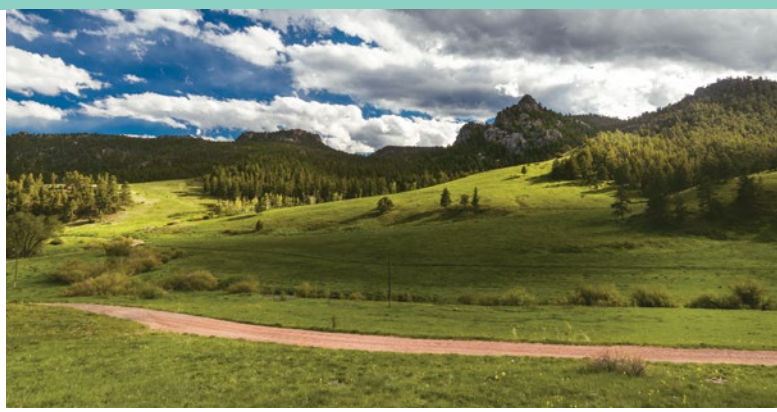
The system constantly changes its flow regime from dead-end filtration to flushing mode. This constant change in flow conditions, prohibits the formation of scaling crystals, and forces bacteria to constantly adapt to the changing conditions, leaving bacteria with less available energy for reproduction.

PFRO™ simplifies RO design from a multistage to a single stage, while allowing operation at a higher flux of up to 50% compared to standard RO systems, leading to CAPEX savings of up to 20%.

Tertiary Treatment RO plant, Chennai Metropolitan Water Supply & Sewerage Board (CMWSSB), Koyambedu India

The Koyambedu Tertiary Treatment RO plant is India's largest, most technologically advanced water reuse project, and the first reuse facility in India to use ozonation for disinfection. With a capacity of 45,000m3/d, the project will make the city of Chennai the first in India to reuse more than 20% of its treated water - freeing +16 million m3 of freshwater each year for more than 10 million people living in Chennai. IDE supplied the RO section of this facility.

Recently, Koyambedu has won the 2020 GWI Distinction Award for Wastewater Project of the Year at the Global Water Awards, recognized for great innovation in optimizing its environmental footprint.



Cherokee Metropolitan District's High-Recovery Wastewater Reuse plant, Colorado USA

Awarded in 2020, the Cherokee Metropolitan District (CMD) Wastewater treatment plant will utilize IDE's PFRO™ to be able to comply with a Colorado court order to lower its total dissolved solids discharge to under 400 mg/L.

Until recently, the CMD used a traditional secondary process. However, in order to meet the new discharge limits for TDS, a membrane bioreactor and RO have been added. The new plant design uses a 9 MGD MBR and a 1.9 MGD High-Recovery RO, designed to enable the RO permeate to be mixed with the MBR filtrate, which will help dilute the final effluent below the 400 mg/L permit level.

With brine management being a critical factor in the RO design, it became evident that high recovery of 90-95% was needed, leading to a compact design of 3x0.7 MGD trains and a single stage of PFRO™, which will be replacing the current 2-3 stages of RO. The project is slated for a 2021 commissioning.

FROM DRAIN TO TAP

Reusing municipal wastewater is a necessary way to address the world's growing water demand. As a trusted and highly experienced supplier of desalinated water, we offer solutions that comply with, and exceed, environmental and regulatory requirements, including the conventional Fully Advanced Treatment (FAT), as well as the safer and more efficient Pulse Flow RO (PFRO™) solution.

FULLY ADVANCED TREATMENT (FAT)

FAT is the conventional solution for municipal wastewater reuse facilities, and tipically includes three stages - UF/MF, Standard multi-stage RO and UV/AOP - which produces water that meets the requirements of California's Title 22, complies with California's title 22 regulation. During this process Chloramine is typically dosed to control biofouling.

SUCCESS STORIES

Central Coast Blue - Advanced Water Purification Demo Facility, Pismo Beach, California USA

In an effort to fight water scarcity, the Central coast blue coalition in California initiated a water purification demo facility in the City of Pismo beach that operated in 2018-2019.

IDE provided a PFRO RO skid that produced 30 GPM of high quality permeate and reached 85% recovery, while showing stable performance, high RO specific flux and stable differential pressure.

All operational goals were achieved without Chloramine dosage, all while maintaining minimal membrane fouling.

Joint Water Pollution Control Plant (JWPCP) Demo Facility, Metropolitan Water District, Carson, California USA

Part of the recently launched Regional Recycled Water Program in California, included a pilot conducted at the Advanced Purification Center in Carson, which aimed to test different operation regimes and processes.

IDE was tasked with designing and constructing a reliable RO system. Producing 0.4 MGD, this system includes 16 PVS in two passes, two stages in each, in order to reach the highest quality of wastewater, designed to meet the extremely strict requirement of low nitrate rates in the produced water.
To date, IDE's solution is meeting the expected results in full.

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TECHNOLOGY ADVANTAGES OF IDE ECO-REUSE PFRO™

Energy Efficient | About 35% less energy consumption in the UV/AOP stage. Lower head loss thanks to a single stage design and a proprietary cleaning mechanism

Simpler design and maintenance | single stage design - less piping, no interstage boosters

Reduced scaling and biofouling | Intermittent flow, higher shear force and unique preventive maintenance mechanism keeps the membranes constantly clean

Safer | Chloramine-free = no formation of harmful disinfection by-products such as NDMA

Eco friendly | Minimized environmental impact by reducing the use of chemicals

Cost efficient | Optimized CAPEX is enabled thanks to higher flux RO operation

Higher Recovery rates | 90% recovery and higher