

Treatment Summary

TriCo Regional Sewer Utility currently operates a Class IV, 5.72 MGD Water Resource Recovery Facility (WRRF) consisting of three (3) Influent mechanical screens, a new grit removal system, eight (8) vertical loop reactors and a three (3) ring Orbal oxidation ditch providing biological nutrient and phosphorus removal, six (6) secondary 70' diameter clarifiers, ultraviolet (UV) light disinfection and post aeration with fine bubble diffusers. Sludge management includes five (5) aerobic digesters and a belt filter press. Biosolids are hauled off-site, and land applied by a private contractor.

Equipment Specifics

Two (2) Kusters Protektor Perforated Plate Filter Screens

The Kusters Water Perforated Plate Filter Screen was developed to solve modern day screening problems which occur in wastewater pretreatment. The Kusters Water Perforated Plate Filter Screen eliminates operational disruptions caused by fibrous and other inorganic material. Depending on the perforated panel, the screened material is greater compared to a bar screen. The quality of the screened effluent is noticeably improved, which in turn improves performance and protects downstream equipment.

https://www.zimacorp.com/fileadmin/Downloads/Zima/Headworks/ZIMA472-KW-Perf_Plate_Filter_Screen-web-10.03.22.pdf

One (1) MEVA ROTOSCREEN RS

The Meva Rotoscreen is a self-cleaning fine screen for the separation of solid particles from water. The screen has a very low flow resistance that provides a low head loss and the highest relative capacity of all screen types on the market, which is an advantage for open-channel installation.

https://www.nordicwater.com/wp-content/uploads/2016/05/S1127-RS-brochure_EN.pdf

Two (2) Hydro International HeadCell

The HeadCell modular stacked tray grit separator captures and retains 95% of all grit 75 micron and larger with minimal headloss, protecting downstream equipment and processes from abrasive wear and sedimentation.

With a small footprint, no electrical requirements, and no moving parts the HeadCell delivers exceptional and economical solids removal for all sizes of water resource recovery facilities (WRRFs) - helping them to maintain treatment effectiveness and cut operation and maintenance costs.

The unique stacked tray design provides the surface area required for outstanding performance with a small footprint, enabling treatment capacity increases using existing space, and its durable design ensures long component life with minimal wear and grease build-up even under challenging operating conditions.

Enabling plants to meet stringent environmental requirements with less odors, the HeadCell is the ultimate grit removal solution for new plants as well as representing a value-for-money retrofit option for grit removal upgrades. For new headworks grit control systems, the HeadCell can be installed in a

poured-in-place concrete basin above or at grade, with a footprint much smaller than conventional grit removal systems.

https://hydro-int.com/sites/default/files/headcell_0.pdf

Two (2) STJERNHOLM Grit Washers

The Stjernholm Grit Washer collects grit, organics and water from the grit chamber that is introduced in the top of the grit washer to the tank where a slow spinning agitator is stirring the blend at 4-7 rpm to maintain a retention time of at least 4-7 minutes – just enough to keep the organics in suspension while allowing the grit to settle to the bottom. The grit is washed in the bottom of the grit washer where a fluidized grit bed is created by introduction of low-pressure wash water. The washed grit enters the screw conveyer from the bottom of the tank and is dried by gravity while conveyed to a container ready for transportation. The screw conveyer is controlled according to the agitator load. The organics are carried out by the upward flow created by the wash water and over the overflow weir as reject water for additional treatment downstream. The Stjernholm Grit Washer is available in 4 different sizes with a capacity up to 3 ton washed grit per hour with two screw conveyers per grit washer.

https://stjernholm.dk/wp-content/uploads/01.US_01-22.V1.0.pdf

<https://stjernholm.dk/sandvasker-animation/>

Eight (8) Evoqua Vertical Look Reactors (VLRs)

VLR Systems provide simultaneous nitrification / denitrification in a smaller footprint. The systems utilize looped reactors in series that allows dissolved oxygen stratification. The tanks are similar to oxidation ditches that have been flipped on their sides. There is an upper and lower compartment, separated by a horizontal baffle. The process was adapted from Orbal Multichannel Oxidation Ditch technology and uses the same surface mounted discs to provide mixing and deliver oxygen. Power costs of the VLR system process are 20 to 30% lower than other conventional biological nutrient removal processes. Typically, two or more basins make up the system, with the first tank operating as an aerated anoxic reactor.

<https://www.evoqua.com/siteassets/documents/products/aerobic/mu-vlr-br-1118.pdf>

Twelve (12) KAESER rotary screw blowers

When it comes to KAESER rotary screw blowers with the SIGMA Profile, efficiency is more than just a promise. As operation-ready, “Plug-and-play” complete solutions, low-maintenance blower systems offer exceptional efficiency at the touch of a button. What is more, KAESER rotary screw blowers are designed to be especially compact, can be controlled remotely or automatically for trouble-free operation and are compatible with Industrie 4.0 systems.

Low energy consumption, coupled with the ability to operate at 100% duty cycles, ensures that KAESER rotary screw technology pays off handsomely when it comes to municipal and industrial wastewater treatment, flotation, fluidization and fermentation applications.

<https://www.kaeser.com/int-en/download.ashx?id=tcm:17-5949>

One (1) Three (3) Ring Evoqua Orbal System

Easily identified by its concentric loop design, the Orbal system, uses an activated sludge process designed to address today's nutrient and stormflow issues.

The simultaneous nitrification/denitrification (SND) process is the backbone. The Orbal system features dedicated zones for specific treatment purposes. These treatment zones operate in series during the SND treatment process. The Orbal system has been on the leading edge of SND plant designs for more than 50 years.

The Orbal system can be easily modified to meet a large variation of effluent limits. Typically, only a simple process setpoint or mechanical change is needed to meet more stringent nitrogen or phosphorus effluent limits.

<https://www.evoqua.com/siteassets/documents/products/aerobic/bc-orbal-br-0220.pdf>

Six (6) 70' Evoqua Tow-Bro Secondary Clarifiers

The unique design of the Tow-Bro Hydraulic Sludge Removal System ensures rapid removal of settled sludge with minimal sludge blanket disturbance. Proven in hundreds of installations as well as exhaustive testing programs, the Tow-Bro system offers simple operation, less maintenance requirements, lower construction, and energy costs.

The Tow-Bro Clarifier can also optimize your clarifier for biological phosphorus removal by preventing the release of soluble phosphorus. Evoqua's FEDWA energy dissipating inlet enhances this performance.

<https://www.evoqua.com/siteassets/documents/products/clarification-separation/bc-towbroselect-br.pdf>

Four (4) Trojan UV3000Plus Ultraviolet Bank System

The TrojanUV3000Plus is one of the reasons why UV is now a favored technology in wastewater treatment. As our leading UV system, it has demonstrated effective and reliable performance on six continents where more than 2,000 municipalities rely on it to treat over 30 billion gallons of wastewater every day.

<https://www.resources.trojanuv.com/wp-content/uploads/2018/07/TrojanUV3000Plus-Brochure.pdf>

One (1) Xylem Sanitaire Silver Series II Post Aeration System

Xylem's Sanitaire Silver Series II membrane disc diffusers feature a unique split pattern and slit shapes, which disperse air bubbles in an extremely fine and uniform pattern for high oxygen transfer efficiency. The specially blended, high grade EPDM elastomer compounds resist degradation that's common to other membranes and delivers over 10 years of proven performance.

Lower energy consumption and raised operating efficiencies are made possible by the unique membrane shape, integrated O-ring, and top sealing threaded retainer ring, which eliminates leakage. A highly effective, integrated check valve enables the aeration zones to be easily shut down for air-on/air-off applications.

Sanitaire patented pipe joints are designed to withstand thermal expansion and contraction, water hammer and other dynamic stresses, while pipe supports allow infinite height adjustment for accurate grid leveling. Spline joint design makes it easy to install and eliminates the risk for installation errors for

contractors. Piping and other elements of the Silver Series II system are fully interchangeable with Sanitaire ceramic disc systems.

<https://www.xylem.com/siteassets/brand/sanitaire/resources/brochure/aeration-products-for-energy-efficient-biological-treatment.pdf>

One (1) Alfa Laval AS-H (Ashbrook) Belt Filter Press

The Alfa Laval AS-H Belt Filter Press is a sludge dewatering machine suitable for all municipal wastewater sludge types and a wide variety of industrial solid/liquid separation applications, such as paper, petrochemical, mineral, food processing, pharmaceutical and chemical. The AS-H belt filter press incorporates variable energy mixing, flocculation, gravity drainage and pressure filtration within a single mechanical framework. The AS-H belt filter press offers the versatility of a wide size range and extensive modular options to meet individual process requirements.

<https://www.alfalaval.com/globalassets/documents/products/separation/filters-and-strainers/belt-press/alfa-laval-as-h-belt-press-g3.pdf>

Two (2) Serpentix Pathwinder P2 Conveyors

The Serpentix Pathwinder conveying systems solve difficult bulk handling problems encountered in municipal and industrial applications. Unique design parameters allow the conveyor to follow horizontal, vertical, and helical paths. These diverse path capabilities provide an alternative when adapting a conveyor to an existing facility where interfacing with more permanently positioned equipment is required.

<https://www.serpentix.com/pathwinder/>