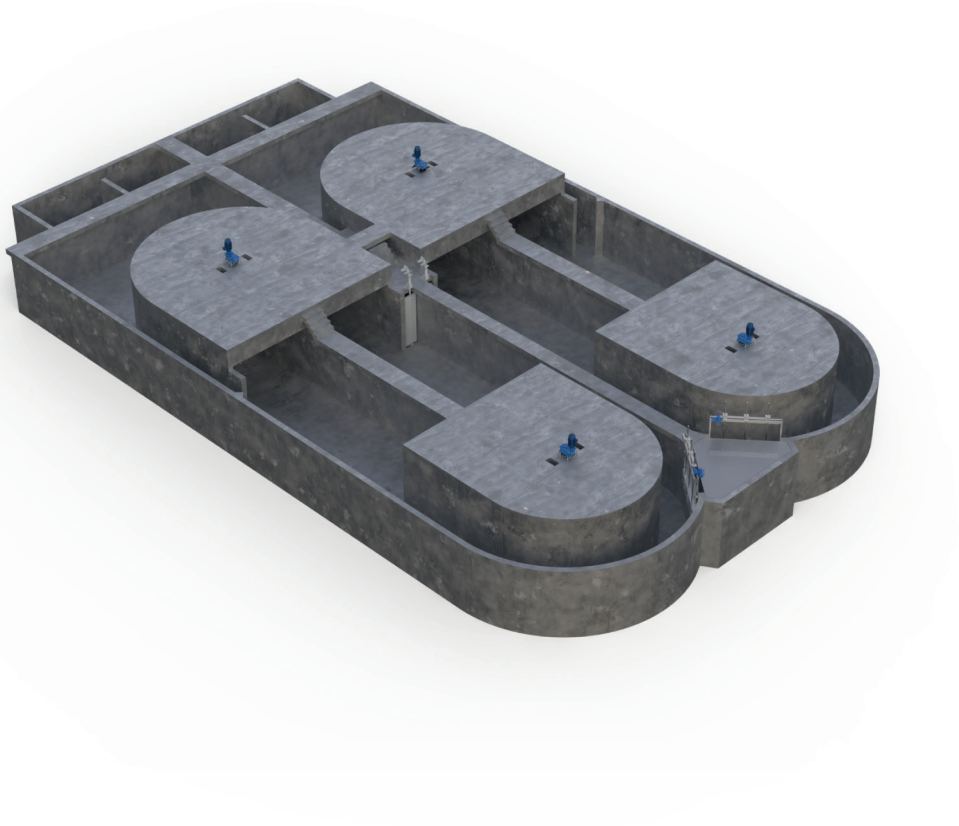
PROCESS AERATION

CARROUSEL® BNR SYSTEM

SIMPLICITY MEETS RELIABILITY



OVIVO

Bringing water to life

MAXIMUM RESULTS, MINIMAL EFFORT

ADVANCED OXIDATION DITCH FOR SUPERIOR BIOLOGICAL TREATMENT

The Carrousel® BNR System is a family of wastewater treatment products that features multiple configurations and innovative components to help you meet the most stringent biological nutrient removal (BNR) limits.

This system's characteristic racetrack-style aerobic basin is the backbone of all BNR configurations.

Aerobic basins, powered by vertical-shaft mechanical aerators, remove biochemical oxygen demand (BOD) and ammonia.

Anoxic basins with an internal recycle (IR) mechanism remove total nitrogen (TN).

Anaerobic basins promote biological phosphorus removal (Bio-P).

Its products comprise a simple, reliable, and flexible treatment system that maximizes biology to avoid dependance on expensive chemical treatment. Operators value the ease of operation and maintenance and the forgiving process operation of the Carrousel System.

Engineered with simplicity in mind, the Carrousel System offers a powerful portfolio of biological treatment options, developed through years of innovation to elevate oxidation ditches to superior treatment capabilities.

DON'T DITCH THE OLD DITCH!



A BUG'S LIFE

At its core, the Carrousel System keeps a healthy and robust microbial population that can treat wastewater for us. Aeration and organic carbon are the most critical forces for all bugs that drive BNR treatment. The Carrousel design optimizes how aeration is delivered in its racetrack basin and maximizes carbon use in anaerobic and anoxic tanks.





CARROUSEL SYSTEM BENEFITS

- **SIMPLE** | Easy to construct, operate, and maintain.
- **RELIABLE** | Robust mechanical equipment and forgiving process operation.
- **FLEXIBLE** | Adapts to fluctuations and accommodates different operating strategies.
- **SUPERIOR BNR PERFORMANCE** | Can meet TN < 3 mg/L and TP < 1 mg/L with minimal to no chemicals.
- **UNMATCHED POWER TURNDOWN** | The Excell Aerator allows for power turndown of up to 90 percent—without the need for booster mixers.
- **EASY CONTROL** | A user-friendly interface between the process equipment and the operators provides simple and powerful tools to optimize treatment.
- **PROVEN** | Over 900 installations in North America.

MEET THE CARROUSEL FAMILY

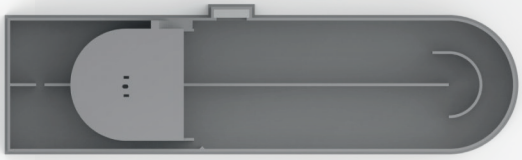


The Carrousel product family comprises several configurations that can address multiple treatment objectives.



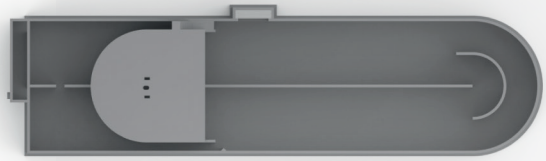
Single-Stage Carrousel

Considered the backbone of all BNR configurations, this racetrack configuration features the low-speed Excell® Aerator and can achieve BOD removal and full nitrification. In addition, its strong dissolved oxygen (DO) profile between aerators enables simultaneous nitrification-denitrification (SND). Deep-tank configurations are available.



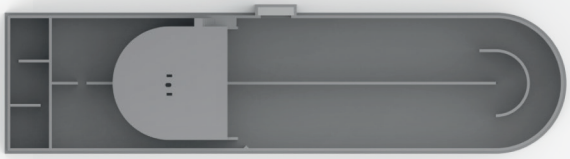
denitIR® System

Based on the two-stage Modified Ludzack-Ettinger (MLE) configuration, the denitIR system targets TN removal with the addition of anoxic basins and an innovative internal recycle (IR) controlled by the EliminatIR™ gate. No IR pumps needed!



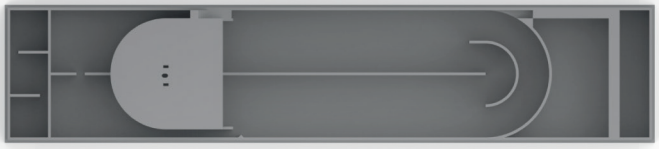
AlternatIR™ System

The two-stage AlternatIR system adds an innovative, influent swing zone to address TN and TP limits. The influent alternates between up-front basins via the automated divertIR™ gate, enabling denitrification and Bio-P modes.



A2C™ System

This BNR system has three stages to address TN and TP limits. The addition of anaerobic basins up front promotes Bio-P removal.

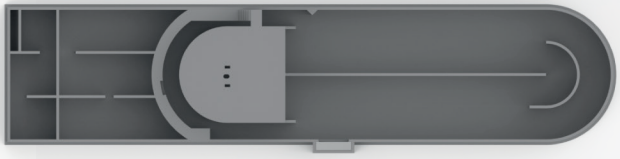


Bardenpho® System

This system adds post-anoxic and re-aeration basins to comply with stringent TN limits.



It offers four- or five-stage BNR configurations.



SelectIR™ System

The SelectIR configuration promotes densified biomass for enhanced sludge settling with an abundant carbon-storing bacteria population. It adds an up-front swing zone to enable a mixed liquor suspended solids (MLSS) fermentation cycle for superior BNR performance.

* The Carrousel® technology is provided to Ovivo through a license with Royal HaskoningDHV

EQUIPMENT AND PROCESS POWERHOUSES





Excell® Aerator

At the heart of all Carrousel configurations, the vertical-shaft Excell Aerator provides all the aeration to satisfy the process demand and generate the circulating velocity to keep MLSS in suspension and induce the IR flow to the anoxic basin. The Excell Aerator provides unmatched turndown capability with an innovative dual impeller configuration to generate proper floor scouring velocities at minimum aeration power. No need for additional booster mixers! With the highest certified aeration efficiency in the oxidation ditch market, the Excell Aerator is simple to operate with minimal above-deck maintenance, delivering superior performance.



Oculus™ Control System

Known as the “all-seeing eye,” the Oculus Control System keeps a tight rein on DO, oxidation-reduction potential (ORP), nitrate, and ammonia, maximizing nutrient removal and minimizing energy costs and chemical dependance. Operators can control all functions, set points, and trend charts from a customized touch-screen interface. Remote monitoring is also available. For complete integration of process equipment and controls, Ovivo offers programmable logic controller (PLC) panels, variable frequency drives (VFDs), motor control centers (MCCs), and plug-and-play E-Houses.



EliminatIR™ Gate

A distinctive feature in all Carrousel BNR configurations, the patented EliminatIR gate controls the IR flow that circulates between the aerobic and anoxic basins for TN removal. It is fully automated to bring the optimum amount of nitrates to the anoxic basin based on the process conditions up front. No IR pumps required!

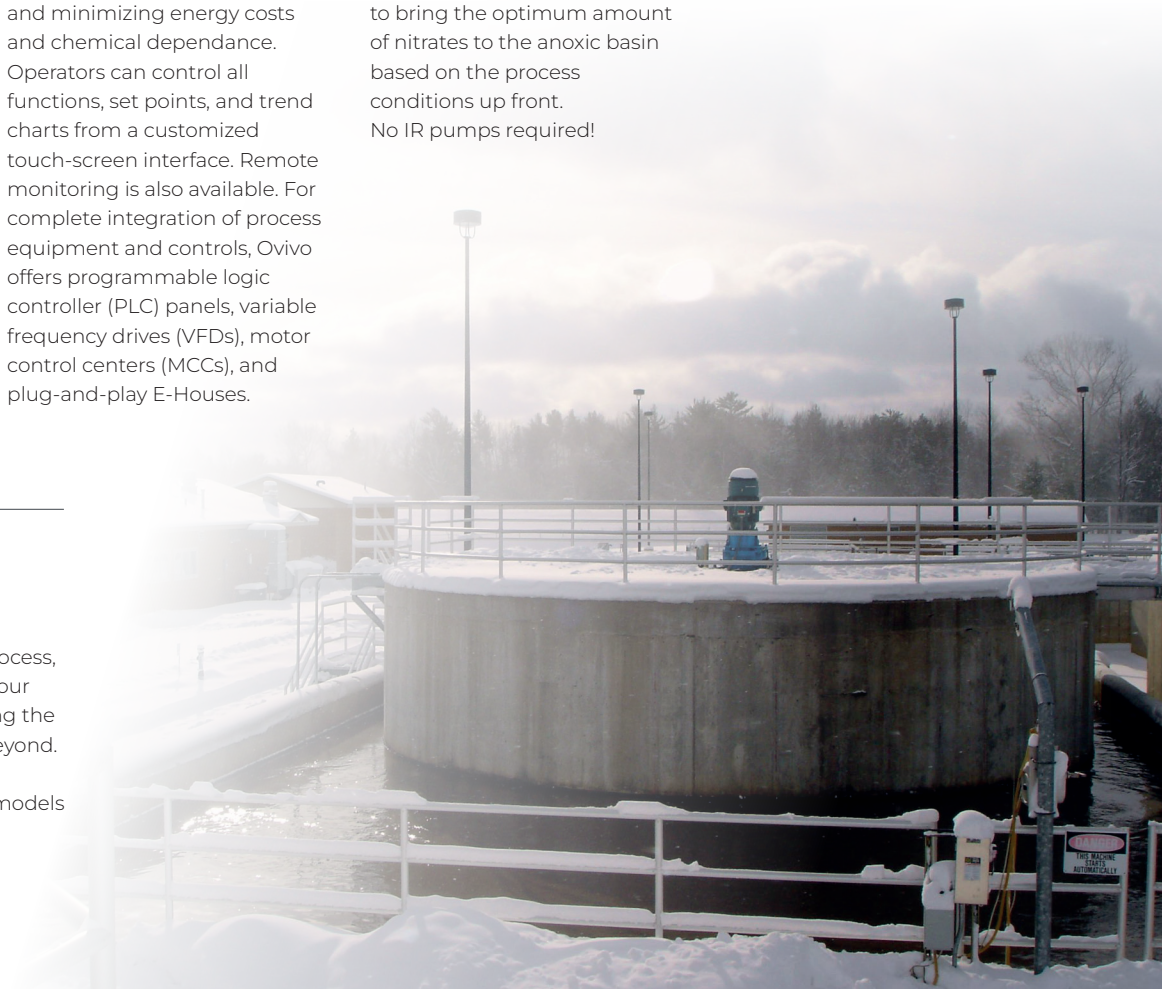


Mixers

All Carrousel configurations offer a variety of mixing technology options to meet the end user’s preference, including submersible mixers, vertical-shaft mixers, and compressed-air mixing.

Services

The Carrousel team is committed to long-term support. Comprised of process, mechanical, and control engineers, our team provides holistic support during the design and start-up phases—and beyond. Detailed support includes BioWin modeling, process calculations, 3D models and CAD drawings, process training, and troubleshooting services.



1976 Ovivo signed Carrousel license agreement for North America.

1979 Installed first Carrousel® System in the USA.

1983 Installed first Bardenpho® System.

1988 Installed first denitIR® System.

1991 Developed and installed first Dual-Impeller Aerator.

1992 Installed first A2C™ System.

1998 Developed and installed first PLC control system.

2001 Developed and installed first deep-tank Carrousel System (23-ft SWD).

2007 Introduced the Excell® Aerator. Our most efficient dual-impeller aerator for BNR.

2009 Introduced the EliminatIR™ gate to maximize, optimize, and automate BNR.

2010 Introduced the Oculus™ BNR Control System.

2012 Developed and installed first AlternatIR™ System.

2024 Introduced the SelectIR™ System. Our most advanced BNR treatment.



OVER 900
NORTH AMERICAN INSTALLATIONS





SIMPLE, RELIABLE, FLEXIBLE

With over half a century of innovation and more than 900 installations in North America, the Carrousel System has a proven track record for being the most simple, reliable, and forgiving biological treatment system available.

This product family sets the industry standard in advanced oxidation ditch technology.

Contact Ovivo today to add the Carrousel System to your BNR process.

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Bringing water to life

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