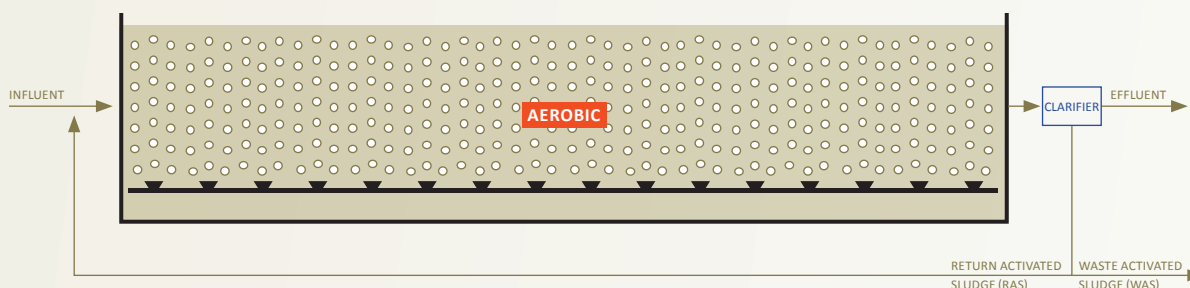


## BIOCYCLE-ENR ACTIVATED SLUDGE PROCESS

# NIT Configuration

The **BioCycle-ENR Nitrification (NIT)** process configuration is a solution that is designed for facilities required to meet effluent ammonia limits by managing the oxygen supply under varying loading conditions throughout the life of the treatment facility. Utilizing the FlexZone™ Adaptive Process Volume System, the NIT process transitions excess aeration volume to simultaneous nitrification denitrification (SNDN) operation. This low dissolved oxygen (DO) environment offers alkalinity recovery through denitrification, efficient carbon management, and unrivaled energy savings.

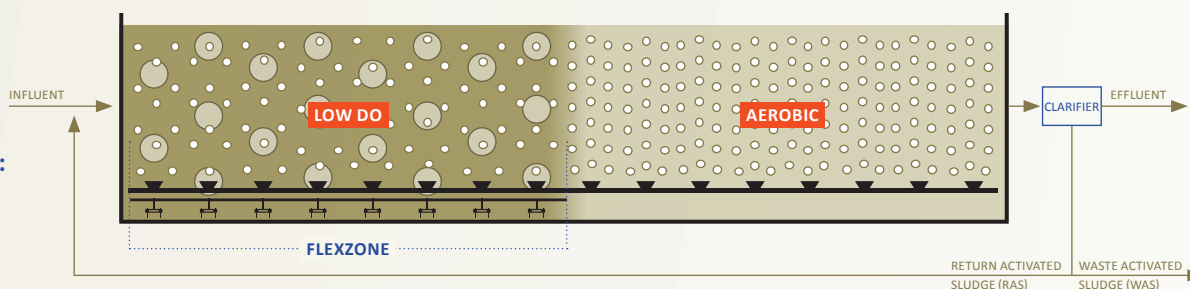
### THE PROBLEM: Conventional Approach



**Fixed aerobic volumes** are designed for a single future state condition, offering **limited flexibility and lack of process control**.

**Excess aerobic volumes lead to mixing limited conditions**, resulting in high DO concentrations and excess energy consumption.

### THE SOLUTION: BioCycle-ENR for NIT



The **FlexZone** system enables **low DO and aerobic volumes to expand and contract** as operating conditions and kinetics change, ensuring effluent quality compliance while minimizing energy consumption.

The **vertical mixing regime of BioMix Compressed Gas Mixing** maintains **the integrity** of low DO and aerobic environments without the need for physical baffled zones.

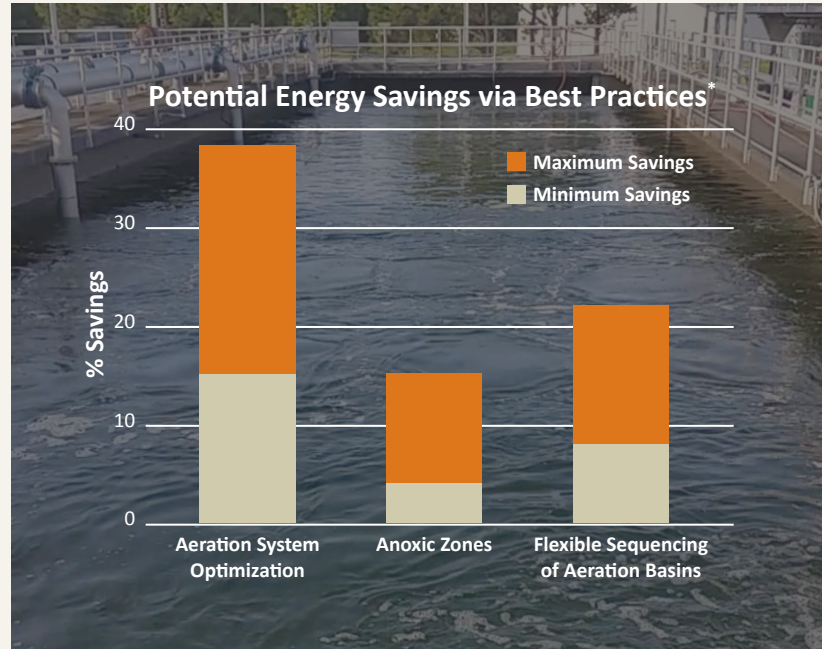
**SyncoMix**, the unique combination of BioMix integrated with fine bubble diffused aeration, **creates low DO environments** and prevents mixing limited over-aerated conditions through **independent control of aeration and mixing**.

## REDUCING ENERGY CONSUMPTION

According to Water Environment Research Foundation's Roadmap to Net Zero Energy, the three largest opportunities for energy savings at wastewater treatment plants are optimization of the aeration system, addition of an anoxic zone, and flexible sequencing of aeration basins. Utilizing low energy treatment options allows plants to get closer to energy neutrality. EnviroMix's BioCycle-ENR with the FlexZone system is perfectly suited to deliver on all three of these opportunities.

- BioCycle-ENR optimizes the aeration system by **matching the oxygen delivery to the oxygen demand through smart aeration controls** that have unmatched turn down and allow for low DO SyncroMix environments with independent control of aeration and mixing.
- Reducing required oxygen delivery by **manipulating the reactor environment to create anoxic conditions** recovers alkalinity and reduces carbon loading through denitrification kinetics.
- The FlexZone system takes sequencing to the next level without compromising mixing by dynamically **transitioning excess aerobic capacity** to energy-efficient mixing or low DO volumes.

\* Water Environment Research Foundation.  
Exploratory Team Report – Energy Management



## KEY ADVANTAGES FOR AN NIT CONFIGURATION



### Process Optimization

- Capitalizing on the FlexZone system, BioCycle-ENR utilizes the proven NIT activated sludge process to dynamically adapt the aerobic environment to changing temperature and loading conditions.
- Ability to manage DO and carbon with proper balance of low DO and aerobic volumes to achieve nitrification goals throughout the life of the system.



### Energy Efficiency

- Provides energy efficient operation by decoupling aeration and mixing.
- Independently meets mixing and oxygen demands with SyncroMix — concurrent operation of BioMix Compressed Gas Mixing and diffused aeration.



### Unparalleled Flexibility

- Offers a process configuration tailored to meet current and future nitrification objectives, optimizing energy consumption and treatment performance.
- Facilitates SNDN to recover alkalinity and reduce chemical consumption.



### Straightforward Operation

- Provides easy access to equipment outside of the tank.
- Requires minimal maintenance of in-tank equipment.

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**TO OPTIMIZE YOUR NIT CONFIGURATION  
WITH BIOCYCLE-ENR.**