

OxyStream™

Biological Nutrient Removal System



WESTECH®

OxyStream™ Oxidation Ditch



The OxyStream™ oxidation ditch system combines slow-speed surface aerators with an oxidation ditch design based on site-specific conditions and WesTech's proprietary hydraulic model.

Why Choose an OxyStream™?

The OxyStream™ oxidation ditch is a modified, activated-sludge, biological treatment process that removes biodegradable organics from wastewater. The OxyStream™ process combines vertically mounted, low-speed surface aerators with a continuous racetrack layout to maximize oxygen transfer efficiency while maintaining the greatest flexibility for power turndown.

In addition, the OxyStream™ has greater side water depths and fewer required aerators than a conventional brush rotor or disc rotor oxidation ditch. The vertical slow-speed surface aerator eliminates maintenance-prone horizontal shafts, pillow-block bearings, and drive units near the water surface.

Process System

WesTech provides a complete and complementary process design for every OxyStream™ application. After a thorough review of the influent characteristics, WesTech's engineers generate process calculations and size the reactors. The oxidation ditch dimensions and oxygen requirements then dictate the proper impeller size and aerator horsepower.

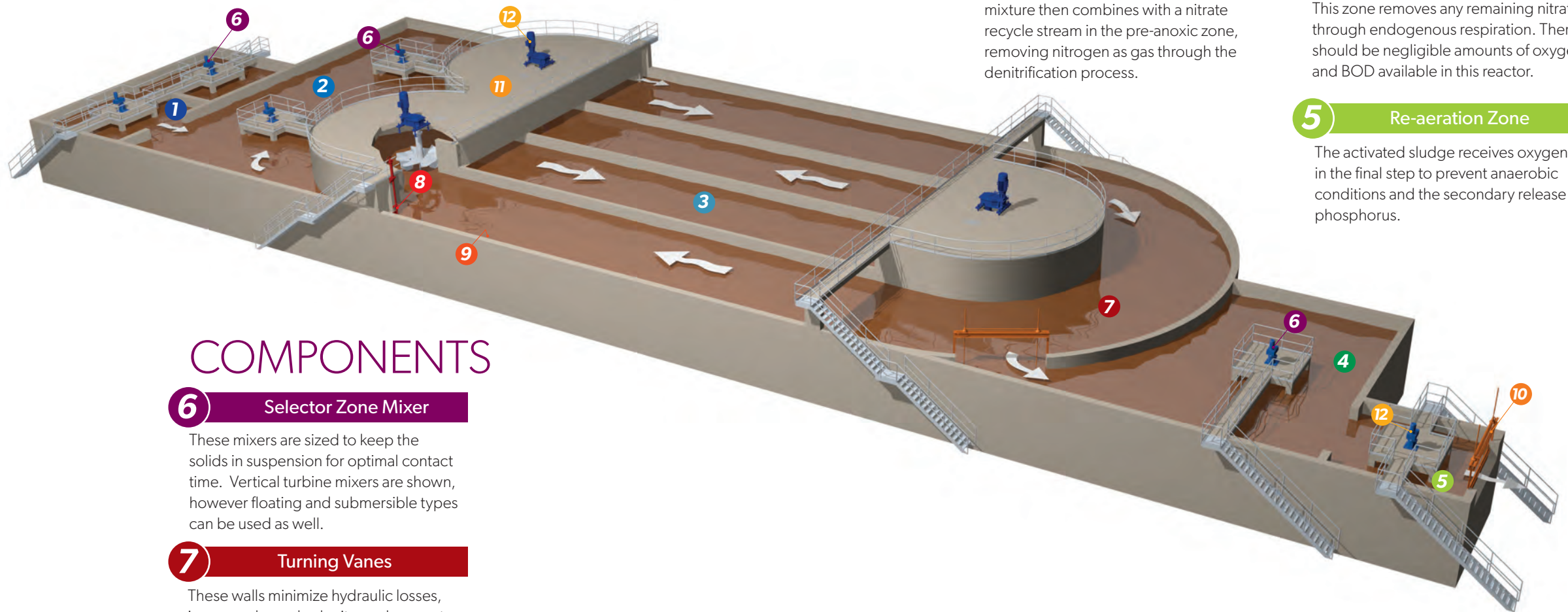
If required, biological selector zones may be added to create a process flow sheet that can meet the most stringent nutrient limits. The OxyStream™ system is backed by a WesTech process guarantee and includes operator process training.

Features

- Most Efficient Surface Aerator
- Increased Power Turndown
- Proven Technology
- Performance Guarantees
- Equipment Monitoring
- Flexible/Automated Operation
- No License Fees

Benefits

- Energy Savings
- Improved Pumping Capacity
- Minimized Downtime
- Extended Drive Unit Life with Lower Operational Forces
- Improved Process Performance
- High-quality Effluent



STAGES

1 Anaerobic Selectors

In this zone, return activated sludge and the influent wastewater mix together without oxygen or nitrate present, promoting increased phosphorus uptake in the aerobic channels.

2 Pre-anoxic Zone

The activated sludge and wastewater mixture then combines with a nitrate recycle stream in the pre-anoxic zone, removing nitrogen as gas through the denitrification process.

3 Aerobic Channels

The proper amount of oxygen and mixing allows the complete oxidation of BOD and ammonia. Organisms selected in the fermentation stage accumulate phosphorus for removal in the waste sludge.

4 Post-anoxic Zone

This zone removes any remaining nitrate through endogenous respiration. There should be negligible amounts of oxygen and BOD available in this reactor.

5 Re-aeration Zone

The activated sludge receives oxygen in the final step to prevent anaerobic conditions and the secondary release of phosphorus.

COMPONENTS

6 Selector Zone Mixer

These mixers are sized to keep the solids in suspension for optimal contact time. Vertical turbine mixers are shown, however floating and submersible types can be used as well.

7 Turning Vanes

These walls minimize hydraulic losses, increase channel velocity, and prevent solids settling in the bend of the reactor.

8 Internal Recycle Gate

This gate allows the nitrate recycle stream to flow from the aerobic channels to the pre-anoxic zone without any pumping.

9 Dissolved Oxygen Probe

The dissolved oxygen (DO) probe controls the oxygen input of the surface aerators. The DO should be low prior to entering the pre-anoxic zone.

10 Effluent Weir

The flow moves over the weir to the secondary clarifier for liquid-solids separation. The weir can be adjusted to set the proper impeller submergence.

11 Aeration Deck

The aeration deck contains all splashing and aerosols from the aerator. It also provides a safe environment for routine maintenance.



12 Landy-7 Surface Aerators

At the heart of every OxyStream™ is the Landy-7 slow-speed surface aerator providing both aeration and mixing. This impeller has the highest oxygen transfer efficiency (OTE) of any slow-speed surface aerator on the market today, achieving a guaranteed minimum OTE of 3.8 pounds of oxygen per horsepower per hour in oxidation ditch applications.



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