



CASE STUDY

Setting the Standard for Sustainable Water Treatment Solutions

Newterra Sets Industry Standard with Sustainable Water Treatment Solutions, Ensuring Ongoing Energy Efficiency and Environmental Stewardship

Market Served: Municipality
Application: Retrofit/Upgrade System
Location: Tennessee, USA
Challenge: cBOD5 & Ammonia Reduction
Solution/Service: Tri-Oval® Oxidation Ditch

Summary

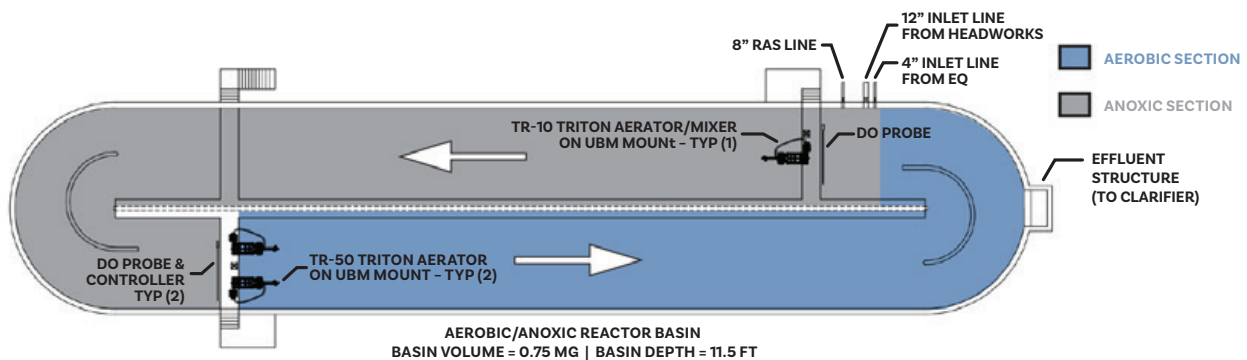
Newterra provided its Tri-Oval system with three Triton aerator/mixers controlled by dissolved oxygen instrumentation to a municipality located in Tennessee. The retrofit system replaced existing aeration equipment and was designed to provide nitrogen removal within the existing 0.75 MG oxidation ditch. Separate aerobic and anoxic zones were established by using two TR50 Tritons to provide mixing and aeration in the aerobic zone while, one TR10 Triton aerator/mixer, used primarily for mixing, operated in the anoxic zone (see chart below).

Variable Frequency drives coupled with dissolved oxygen instrumentation automatically adjust the aeration output to target a specific DO concentration to induce denitrification near the influent zone.

Minimum DO setpoints keep the aeration zone within a nitrifying range while maintaining the anoxic zone within a denitrification range. The PLC continually logs DO & motor speeds for all motors onto a flash drive connected to the Human Machine Interface (HMI). Data is available both onsite and remotely.

System Testing

City operators provided test data from the facility, which included influent flow and concentrations for both cBOD5 and ammonia. The data was then used to compare loading to the oxidation ditch. Based on average flow and concentrations for the test months, an average actual oxygen requirement (AOR) was calculated (see charts on next page).





Case Study: Tri-Oval[®] Oxidation Ditch

Newterra TR Series					
Date	BOD	Ammonia	Max BOD O ₂ Demand	Ammonia O ₂ Demand	Total AOR
	(lb/d)	(lb/d)	(lb/d)	(lb/d)	(lb/d)
Month 1	361	74	434	339	773
Month 2	258	67	310	308	618

Newterra 2.0 Series					
Date	BOD	Ammonia	Max BOD O ₂ Demand	Ammonia O ₂ Demand	Total AOR
	(lb/d)	(lb/d)	(lb/d)	(lb/d)	(lb/d)
Month 1	423	74	507	340	847
Month 2	305	55	366	254	620

The provided data and subsequent calculations show that the AOR for the 2.0 Series was higher for both Month One and Month Two than the TR model.

Energy Savings Achieved

Power consumption for the TR and 2.0 Series was calculated using motor frequency data taken at 15-minute intervals. Accounting for the difference in AOR, the **Triton 2.0 consumed 20% less energy** without the need for electrical updates or any changes to existing infrastructure. (see chart below).

Upgrading equipment offers a dual benefit: **cost savings and environmental impact reduction**. By embracing newer, more efficient technologies, municipalities like these can optimize operations, cutting down on energy consumption and waste. This not only saves money but also minimizes their ecological footprint, contributing to a healthier environment.

In today's climate-conscious world, such initiatives are crucial for long-term sustainability and corporate responsibility.

Power Consumption		
Power Consumption (kWh)	Before Upgrade	After Upgrade
Week 1	4458	↓ 3378 ↓
Week 2	3491	↓ 3459 ↓
Week 3	5274	↓ 3741 ↓
Week 4	5075	↓ 3345 ↓
Week 5	5005	↓ 3494 ↓
Week 6	5165	↓ 4956 ↓
Week 7	4787	↓ 4922 ↓
Week 8	3764	↓ 3179 ↓
8 Week Total	37019	30475

"By improving design and performing rigorous testing Newterra decreased energy consumption by 20% for its flagship model"

What's Your Unique Water Question?

Contact today us at **+1 800.420.4056** to solve your most challenging water issue.

