



CASE STUDY: Post Aeration D.O.

- Fort Valley, Georgia -

Plant Effluent Dissolved Oxygen Addition through Super- Oxygenation

Net-Zero Ultimate BOD Discharge

The City of Fort Valley, GA is located near Macon, GA. The City operates a return-activated sludge, extended aeration wastewater treatment plant and discharges into Bay Creek, a small receiving creek. At lower flows, the plant operators are able to meet their stringent permit requirements but due to the arrangement of the plant, have trouble adding the required oxygen above 1.3 MGD of effluent flow.

The State of Georgia issued a new permit requiring the wastewater treatment plant to add up to 316 lbs of oxygen per day to the plant effluent. The City was faced with two options; 1) spend an additional ~\$2 million on tertiary treatment systems or reverse osmosis equipment to reduce the BOD to below 10 mg/L; or 2) offset the 10 mg/L of BOD and ammonia with dissolved oxygen (D.O.).

The City chose ECO₂'s SuperOxygenation technology to add the required amount of D.O. because of the low cost compared to tertiary treatment equipment and the high oxygen transfer efficiency. With the addition of the ECO₂ system, the plant could operate reliably, and with little operator intervention, to meet the **net zero ultimate BOD discharge** permit by offsetting the 10 mg/L of BOD and ammonia with D.O. for a net zero impact on Bay Creek.

COLLECTION SYSTEMS

HEADWORKS

PRIMARY CLARIFIERS

POST-AERATION

INDUSTRIAL

ECO OXYGEN TECHNOLOGIES, LLC
www.eco2tech.com



ECO₂ System and 12 Pack of Oxygen Cylinders



ECO²

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Project History

New TMDL Regulations

Under Section 303(d) of the Clean Water Act, every state sets its own water quality standards designed to protect, restore and preserve water quality. When a body of water fails to meet water quality standards after application of required technology-based controls, the Clean Water Act requires the state to place it on a list of "impaired" water bodies and to prepare a TMDL analysis. TMDL requirements should guarantee an optimal environment for the aquatic ecosystem.

The D.O. concentration in surface water has a direct and strong impact on the biological life resident therein, affecting the strength and stamina of fish and other aquatic species.

Design

The existing layout of the Fort Valley WWTP had limited space available to install a system to add additional oxygen. The final process before effluent discharge is chlorination/dechlorination. The consulting engineer considered placing the system upstream, midstream, and downstream of the contact chamber, any of which arrangements would have been suitable. In the end, an overflow arrangement was chosen to allow the ECO₂ system to operate on an as needed basis during periods of high flow which required additional oxygen to be added.

The ECO₂ system receives flow from a newly constructed overflow wet well. When plant effluent flow rises above ~1.3 MGD, the additional portion is collected in the wet well. When the level in the wet well is sufficient for pump operation, the system activates and adds oxygen to the effluent, which is then combined with the original effluent flow at the plant outfall.

Project Results

In order to achieve the required D.O. levels in their plant effluent, the City of Fort Valley chose the ECO₂ SuperOxygenation Technology to efficiently and affordably meet their permit requirements.

Costs for the ECO₂ System were less than 20% that of otherwise required tertiary treatment equipment.

Using the Net-Zero Ultimate Oxygen Demand is an economically feasible, yet responsible approach to meeting TMDL guidelines and improving water quality.

The ECO₂ System adds enough D.O. to the plant's effluent to off-set any residual BOD—which enabled the City to meet their discharge permit.