

Case Study: Laguna Lake



TORNADO® Aerators at Laguna Niguel Regional Park, California

Project: Laguna Niguel Regional Park

Location: Laguna Niguel, CA, USA

Client: Orange County

Solution: Freshwater Aeration

Technology: Five (5) 7.5 HP TORNADO® Self-Aspirating Surface Aerators and two Submerged Diffused Air Systems

Background

Laguna Niguel Regional Park, located in Southern California, is a large recreation area that offers hiking and horseback riding trails, picnic areas, woods, and a large 44-acre lake. The man-made lake, once a significant feature of the park, began to suffer. It received a heavy organic load from surrounding runoff areas, discharge from a nearby wastewater treatment facility, and poor aeration. Due to these factors, the lake was unable

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to support aquatic life, while odor and algae problems made the lake less appealing to visitors. In addition, the lake was not providing any aesthetic value to the multi-million dollar homes that surrounded the park. Park owners sought to install an environmentally safe system that would restore the lake to its former condition and provide recreation such as fishing and boat rental.

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Solution

RWL Water worked with the park to install five (5) 7.5 HP Tornado Self-Aspirating Surface Aerators and two Diffused Air Systems in the deepest areas of the lake to oxygenate the lake's bottom. Lake rejuvenation was accomplished by using aeration to speed up the lake's natural cleansing process. The aeration and mixing helped decompose the algae and organic matter and raise the oxygen level to accommodate aquatic life. While the submerged

aerators provided oxygen deep in the lake, the floating aerators provided surface aeration and were disguised as large rocks. The aerators removed the algae and odor problems naturally and kept the oxygen content of the water high enough to support a profitable fishing industry. The lake now enhances the recreational opportunities for visitors and increases the aesthetic value of the area.

Principle of Operation

The Tornado aerator mounts at an angle in the water with the motor and air intake above the surface and the propeller submerged below the water. The solid motor shaft spins a proprietary stainless steel propeller. Water moves at a high velocity through and near the propeller, creating a low pressure zone at the hub. The low pressure

zone draws air in through the stationary intake and down the large diameter draft tube. The air exits into the water at the propeller hub. Turbulence and flow created by the propeller breaks up the air bubbles, mixes the basin, and disperses oxygen.

Reduced Energy Costs

Every Tornado aerator is equipped with a premium efficiency motor to reduce energy costs. Larger motors are designed to work with soft start or Variable

Frequency Drive (VFD) controllers to eliminate power surge penalties and reduce energy costs.

Tornado Surface Aspirating Aerator Technical Features

Rugged Construction

- ▶ Available horsepower range: 2-100 HP (1.5 kW-75 kW)
- ▶ Operational speed: 1800 rpm at 60 Hz (1500 rpm at 50 Hz)
- ▶ Premium efficiency (TEFC) motors
- ▶ 304 stainless steel (standard) or 316 stainless steel (optional) construction
- ▶ Grease-lubricated bearings and a solid shaft ensure a vibration-free design

Markets and Industries

Municipal Wastewater Treatment
Aquaculture
Wineries & Breweries
Chemical Processing
Pulp & Paper Mills
Textile
Oil & Gas
Mining
Dairies
Food & Beverage Processing

Extensive Applications

Activated sludge basins
Sludge holding tanks/digesters
Oxidation ditches
Lagoons
Post aeration
Odor and algae control/air cap
Ice control
Leachate treatment

RWL Water has more than 90 years of combined experience building highly successful water, wastewater, and waste-to-energy treatment solutions for diverse industries and municipalities around the world.

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