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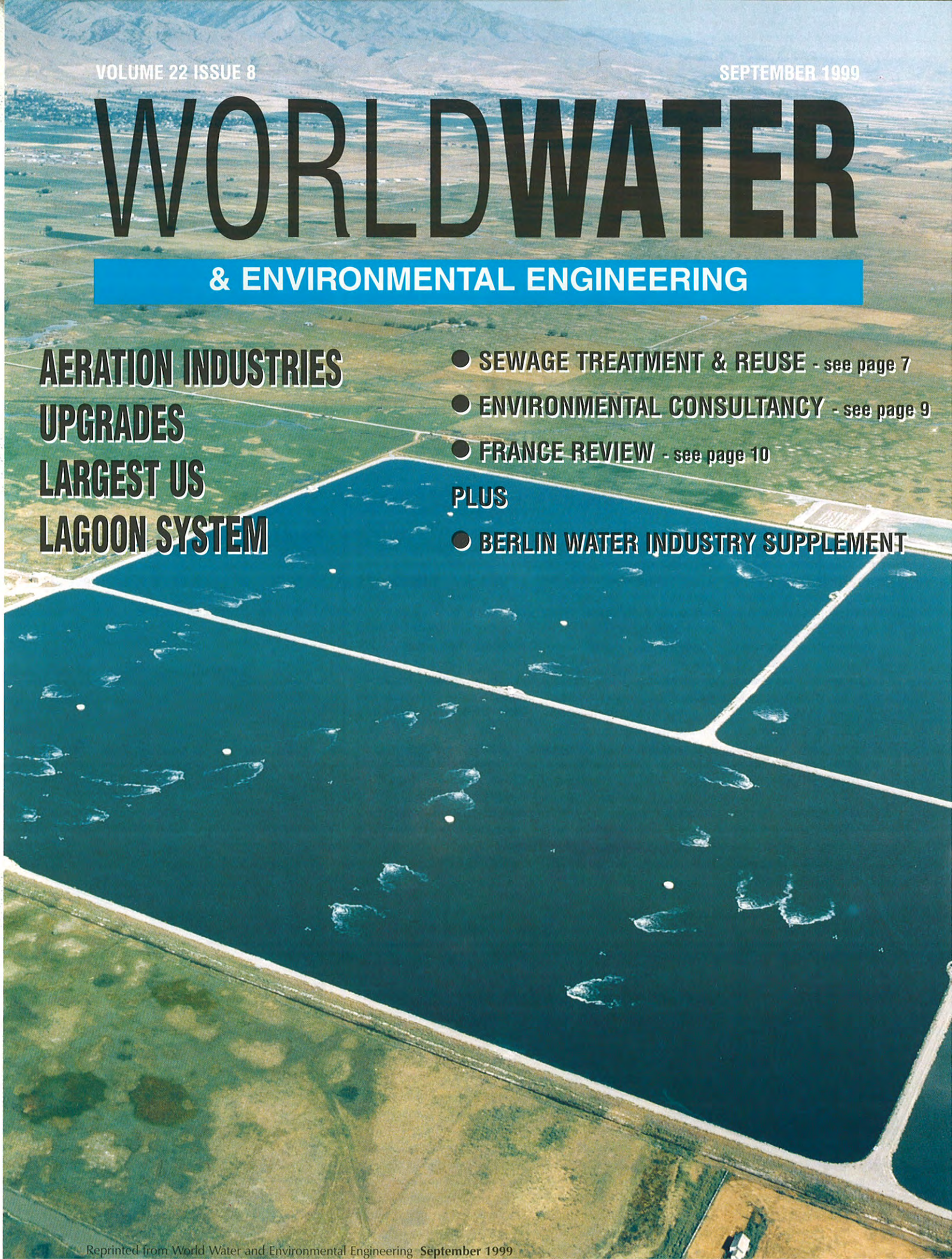

AERATION INDUSTRIES UPGRADES LARGEST US LAGOON SYSTEM

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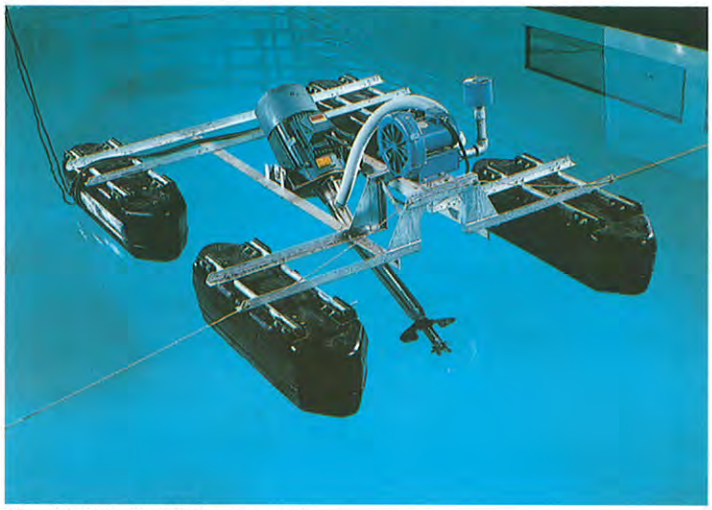
Upgrade for largest lagoon system in US

Seeking to upgrade its wastewater treatment facilities, the City of Logan in Utah decided to install Aeration Industries' TRITON® dual function aerator/mixer in the city's 200ha lagoon system.



The AIRE-0_2 TRITON aerator/mixer

In 1989, a growing population prompted the City of Logan in Utah, USA to look at expanding the efficiency and capacity of its wastewater treatment facility.

The solution for the largest evaporative lagoon plant in the US came with the installation of the AIRE-0_2® aeration system from Aeration Industries International. Now, the city has upgraded by adding new aeration technology from the same company.

Several other cities in the Cache Valley depend on Logan to treat their wastewater. The lagoon system was constructed in 1967 and had performed well over the years. The STP has a 200ha surface area lagoon system (*see cover picture*), a chlorine contact basin and discharges into irrigation canals to the Culter Reservoir.

The lagoons' total volume of 3.85Mm^3 consists of seven lagoons. The average dimension of a lagoon is 881.5m in length x 442.3m in width x 2.13m in depth.

By 1988, these unaerated lagoons were becoming overloaded due to population growth. The Logan STP could no longer adequately treat the increasing wastewater flow. It was recognized that future growth would compound existing hydraulic and organic overloading and result in deterioration of effluent quality and stream discharge quality. Therefore, it was concluded that, to meet new standards, the system needed additional treatment capacity.

Adding mechanical aeration seemed to be the most economical way to raise DO levels, shorten detention time and increase treatment capacity. But the huge surface area and extreme winter weather conditions posed problems.

The AIRE-0_2 aspirating aeration system from Aeration Industries was selected because of its success in cold weather applications and because its adjustable angle of aeration makes it suitable for both shallow and deep lagoons.

Installation of 68 AIRE-0_2 aerators began in the autumn of 1988. A total of 65 14.9kW and three 7.457kW units were installed throughout the lagoons to optimize oxygenation and mixing.

Effluent oxygen readings rose significantly after aeration was installed and detention time was reduced from 120 days down to 30 days. BOD and Total SS removal efficiency was increased.

The upgraded aerated lagoon system served a population of 45,000 in 1989 but was re-designed to meet increasing capacity for several years of expected growth in the Cache Valley. Today, the STP serves approximately 75,000 people with a hydraulic load of 72,143m^3/d. A pretreatment programme monitors industrial discharges and enforces local limits. Influent BOD is 9686kg/d. Effluent BOD is 25mg/l.

In 1997, Logan plant officials decided to add more AIRE-0_2 aerators to the effluent end of the lagoons where algae and ammonia were becoming more problematic.

Aeration Industries suggested they try the company's newest technology: the AIRE-0_2 TRITON® dual function aerator/mixer.

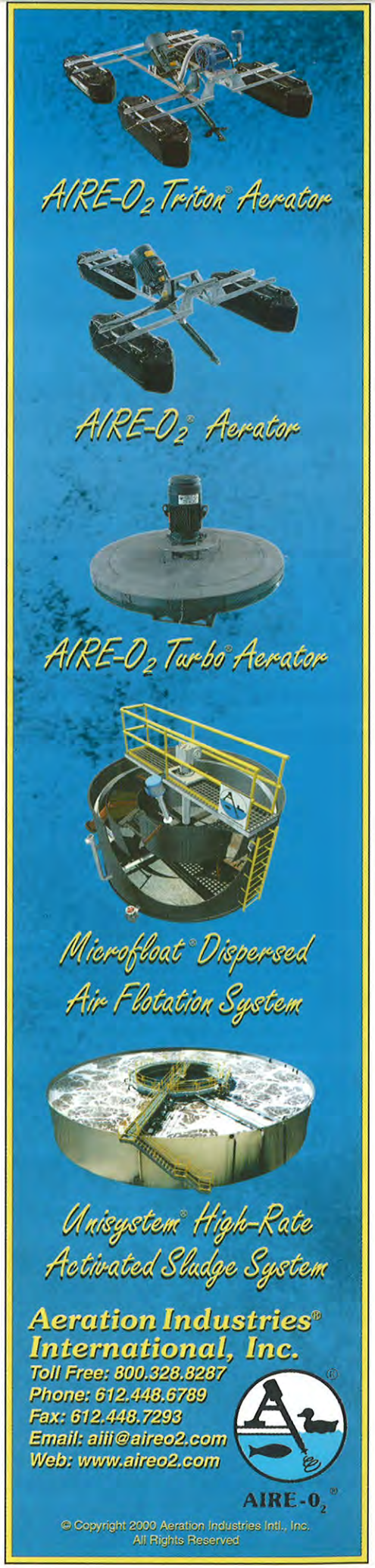
Logan officials visited Aeration Industries' headquarters located in a suburb of Minneapolis, Minnesota, and saw a demonstration of a TRITON in the company's test pool.

Logan's Water and Wastewater Electrical Crew Chief, Dennis Corbridge commented: "The TRITON had more mixing and oxygen capabilities so it seemed to make sense to us to give the TRITONS a try."

Logan is now in the process of installing eight more. Installation has been easy, even in Logan's huge lagoons.

During winter, all the aerators run 24 hours a day. In the summer, the TRITONS operate 24 hours a day but the AIRE-0_2 normally run eight hours a day.

Corbridge compares their treatment efficiency with a smaller community nearby that has a mechanical treatment plant.

"They employ 25 people while we only have three. We average about two manhours a day on our system, mostly for daily clean up of buildings. The aerators are serviced every 1000 hours of operation."

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