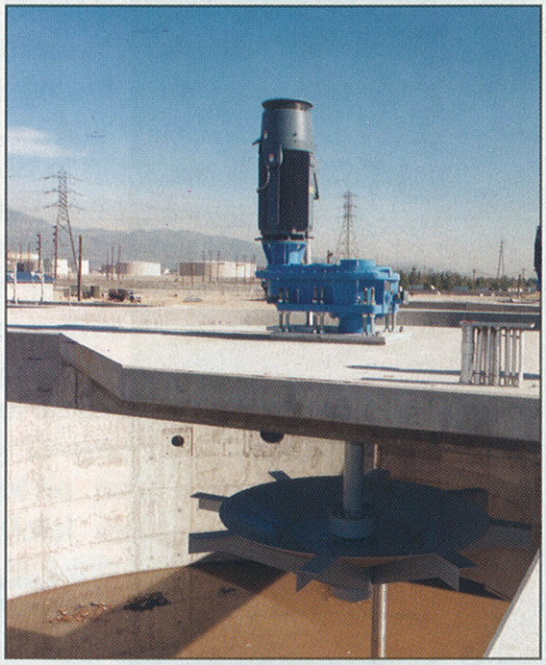
A SCRANTON GILLETTE PUBLICATION

WATER & WASTES DIGEST

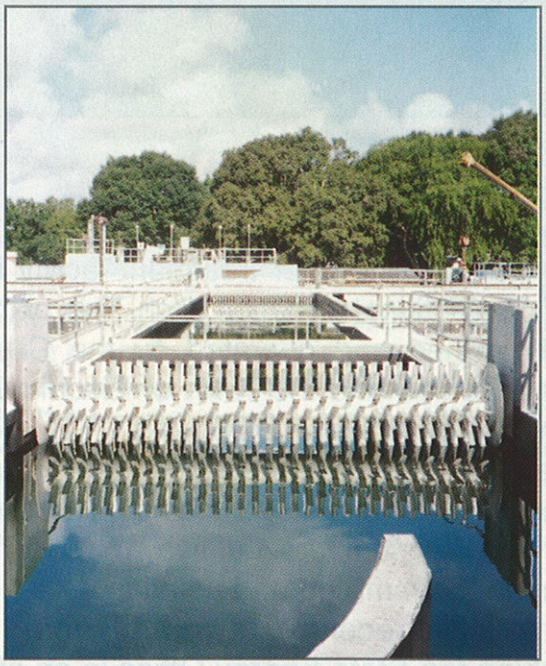
The Product News Source of the Water/Wastewater Field

SIMCAR® vertical turbine aerator

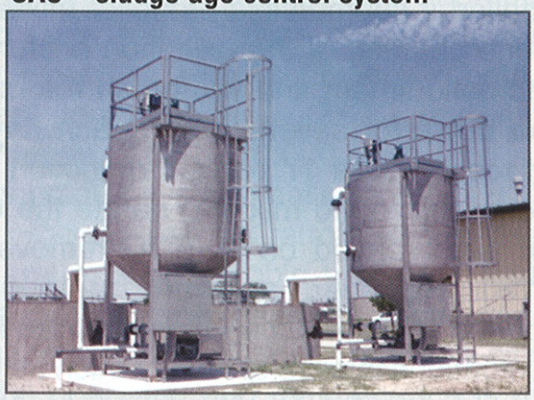


BOAT® intra-channel clarifier

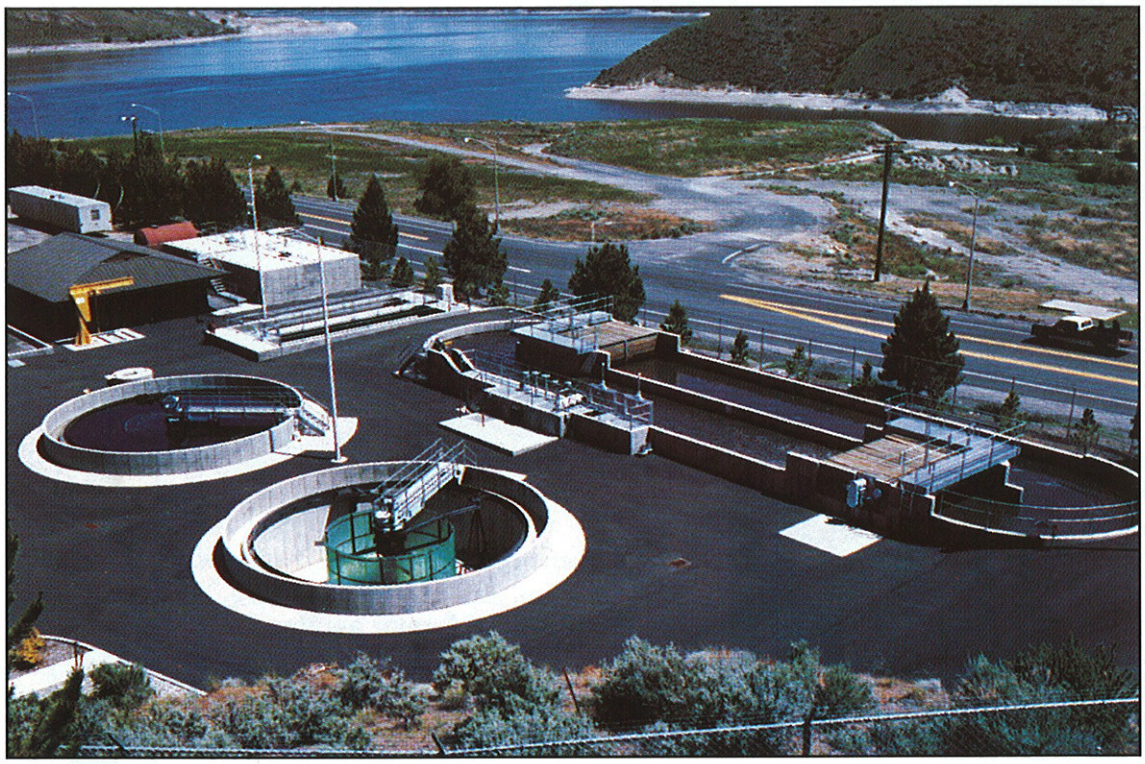
AIRBRUSH™ rotor aerator



SAC™ sludge age control system



Energy Reduction System Provides Nutrient Removal in Washington Facility



The wastewater treatment facility in Grand Coulee, Wash.

Constructed in 1986, the Grand Coulee, Wash.,wastewater treatment facility is a conventional oxidation ditch. This plant is jointly owned and operated by the City of Grand Coulee and the Town of Electric City. High quality effluent BOD and TSS levels were normally experienced, yet effluent nitrate typically exceeded 15 mg/l. The oxidation ditch system utilized two 15 hp brush rotors for both mixing and aeration.

The city received a grant from the Washing-ton State Energy Office in an effort to develop a system to reduce the energy consumption at the plant. The city engineer installed a submersible propeller mixer within one channel of the oxidation ditch. Using automatic timers, the two brush rotors were shut down for several hours each day. The net result was a 17 percent reduction in the energy utilized to mix and aerate the oxidation ditch (based on lb. BOD removed per KWH). However, a better method was required to control the effluent nitrate levels. Fluctuations in several factors such as mixed liquor concentrations, temperature, influent loadings, and flow rates rendered the utiliza-

tion of timers to be a very unstable control system.

Under an EPA Small Business Innovative Research grant, the city's treatment plant was analyzed by the engineer in order to modify the energy reduction system. His goal was to improve the plant's performance with respect to nitrogen removal, sludge settleability, and pH/alkalinity control. For three years, from 1991 to 1993, scientific research was conducted at this municipal facility. A combination of efforts between the city's staff, Brent Denham, and Dr. David Stensel at the University of Washington resulted in the development of a system that reduced the energy consumption while providing a stable method of nitrogen reduction.

The control system that was developed from this research consists of the submerged mixer, an ORP (oxidation reduction potential) electrode/transmitter, and a mini-computer with pre-programmed control software. This control system allowed for the Grand Coulee facility to reduce the plant's energy consumption while maintaining an average effluent TIN (total inorganic nitrogen) level of 5.2 mg/l. In addition, SVIs have been maintained in the range of 60–70 ml/gr, which improves clarifier and aerobic digester performance.

Furthermore, the pH level of the mixed liquor averages 7.4, while maintaining an excellent BOD/TSS effluent level in the range of 2–11 mg/l. These results have been maintained over a wide range of influent conditions, as well as wide fluctuations in both the ambient temperature (8–21°C) and mixed liquor levels (2,500– 10,000 mg/l).

This unique system, called the NITROX™ ORP process, can be retrofitted into practically any existing aerobic treatment system where new, stringent effluent standards are being required. Installation is relatively simple and the operation and maintenance is minimal. This process offers distinct advantages over other nutrient removal systems, since energy reductions can also be provided, along with lower capital and O&M costs.

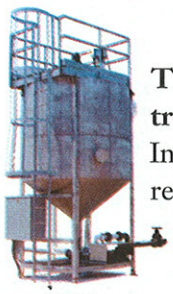
New treatment plants being designed worldwide also will incorporate this unique technology. One such facility is under construction for the Chino Basin Municipal Water District in Southern California. This facility, which ultimately will be a 28 mgd treatment plant, will produce reuse water from the raw sewage. Effluent TIN levels must meet the stringent California standards for reclaimed water.

The triple oxidation ditch layout at Chino Basin utilizes several proprietary systems including the **BOAT@** intra-channel clarifiers, **SIMCAR@** vertical turbine aerators, **SAC™** bio-control systems, and the **NITROX™** ORP process. In conjunction with the utilization of these innovative systems and processes, the Chino Basin Municipal Water District received 100% guarantees for both the effluent performance and the total project cost.

WHAT'S THE DIFFERENCE?

Shooting Craps & Treating Wastewater ...

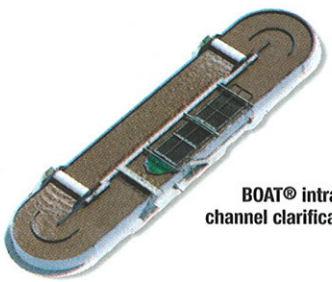
ONE'S A GAMBLE – THE OTHER DOESN'T HAVE TO BE!



SAC™ bio-control system

The high risks of wastewater treatment have been eliminated! Inadequate treatment capacity restricting city growth? Poor effluent quality causing EPA fines? New discharge limits too stringent for out-dated plants?

United Industries has brought together the best innovative wastewater technologies and combined them with computerized engineering designs and proven construction techniques. Non-mechanical clarification systems, high-efficiency aeration units, automatic sludge wasting systems, and patented nutrient removal processes – proprietary technologies from a single source!



BOAT® intra-channel clarification

Did you know ... wastewater treatment systems can be 100% guaranteed:

- Total project costs
- No change orders
- High-quality effluent performance
- Low operation and maintenance costs
- No up-front expenditures

NITROX™ nutrient removal process

Antiquated facilities can be upgraded, expanded, or replaced – without requiring *any* up-front funding. Hybrid-turnkey and privatized programs can be created to meet a city's site specific criteria and requirements. Attractive financial programs can also be offered including the lease-purchase of equipment. **Contact ...**

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