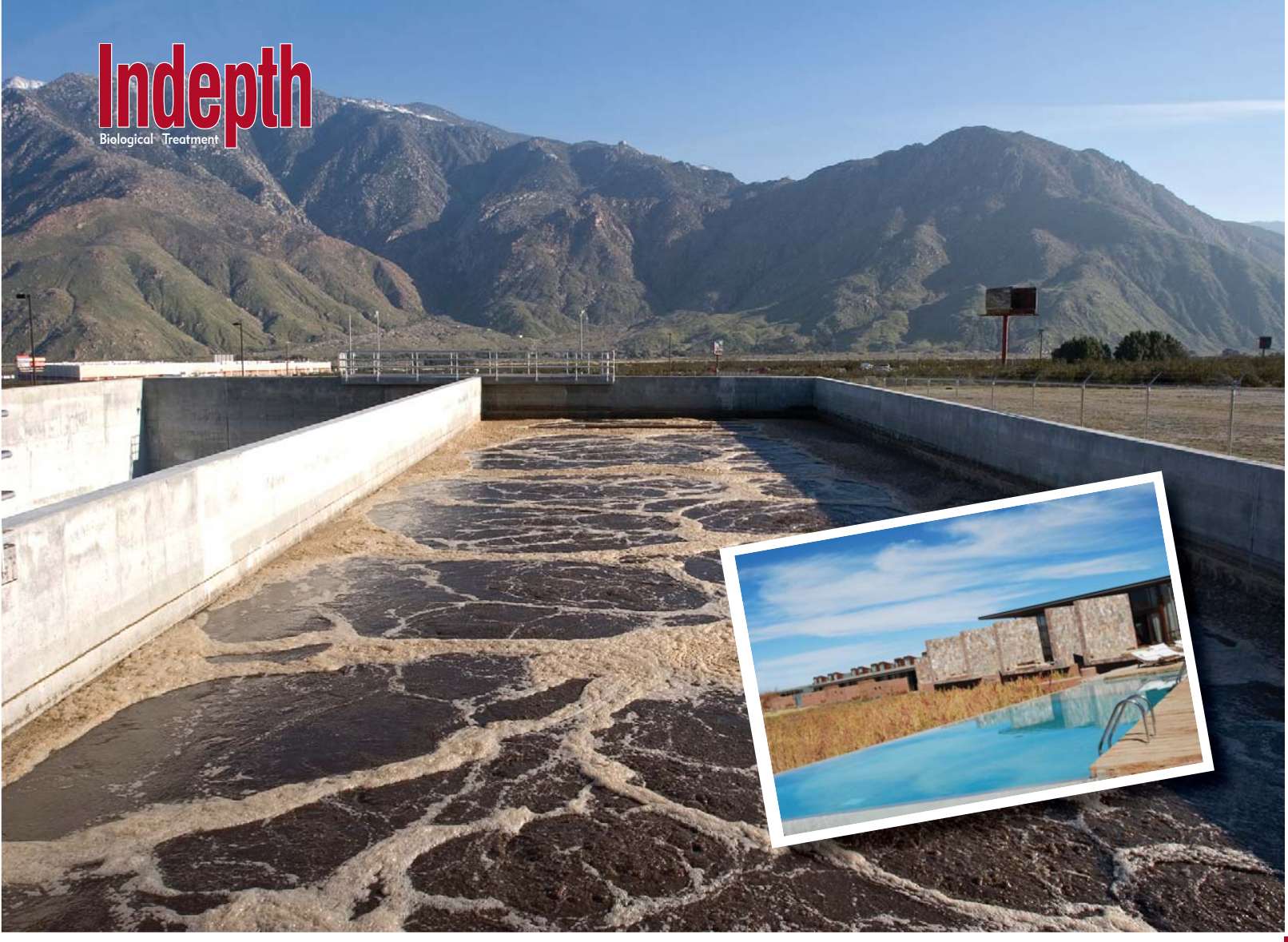

Innovative Technology
Helps Wastewater Treatment Plants Lower Costs

By Jeff Adams and Jeff Fangman

Introduction

When a world-class casino, hotel and spa resort in California wanted to build an efficient and easy to operate wastewater treatment plant, it chose an innovative technology that could handle high-strength wastewater from the hotel and the large weekly variations in flows and loadings. The technology, a combination of sequencing batch reactor and solids reducing technologies, provided an ideal solution for this resort, which has saved on solids handling and energy costs since the new plant was started up.

The Technology

The technology installed at the California resort is an Omniflo Interchange Sequencing Batch Reactor (ISBR), which combines an Omniflo® Sequencing Batch Reactor (SBR) and the Cannibal® solids reduction system. With over 600 installations worldwide, the Omniflo SBR accomplishes equalisation, aeration and clarification in a timed sequence in a single reactor basin. It provides a high level of treatment, nutrient removal and ease of operation, while offering large energy savings and a smaller footprint compared to other treatment methods. The Cannibal sludge reduction system significantly reduces the amount of solids generated by the wastewater treatment process. It does this by combining three components: the solids separation module, sidestream interchange/bioreactor tank and SmartCannibal™ controls,

which allow the system to generate a sludge yield of 0.3 pounds of TSS per pound of BOD treated, or better.

An Easy Choice

The resort initially thought of installing an aerobic digester and sludge drying beds to handle the sludge, but the potentially high energy costs for aerating an aerobic digester caused them to seek a more energy efficient solution. They chose the ISBR for its sludge reducing capability and subsequent decrease in the costs of sludge wasting, stabilisation and disposal. Through a series of physical separation steps, the Cannibal solids separation module removes non-biodegradable material such as trash, grit and inert material present in the mixed liquor of any conventional activated sludge plant. The sidestream interchange reactor requires minimal aeration, which reduces energy requirements. The process significantly reduces the biological solids production by reconfiguring the biology of the treatment process through the interchange process. The small footprint Omniflo ISBR system produces a very low sludge yield of 0.05 to 0.25 pounds of biological solids per pound of BOD per day, compared to a typical SBR system, and provides increased flexibility as well as significant power savings.

System Design

The wastewater treatment system at the resort is a 0.75 million gallon per day (MGD) (2.8MLD) system designed for a 900mg/L BOD load using a design/build approach. The system has biological nutrient removal (BNR) capability by using automated controls that provide an optimum environment for each BNR reaction. It also produces a high quality effluent at varying flows and loadings. The plant's biological treatment system at the resort consists of

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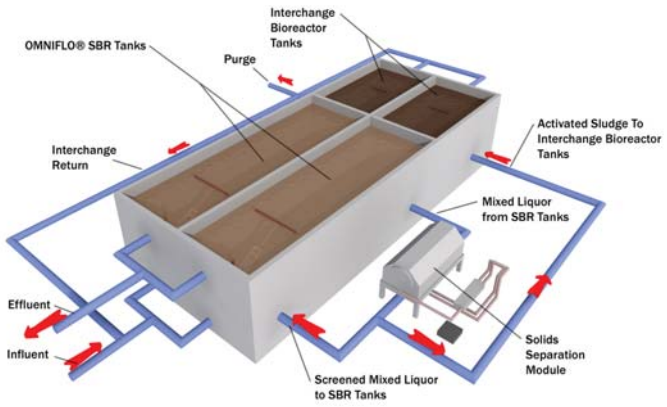

a two-tank Omniflo SBR with Vari-Cant® jet aeration that is operated by a flow proportional control system, which allows the process to automatically adapt to the widely varying flow conditions at the plant. The easy to operate system consists of a fill-and-draw, non-steady state activated sludge process in which one or more reactors are filled with wastewater during a discrete time and then operated in a batch treatment mode. Varying the operating strategy creates aerobic or anoxic conditions to optimise energy use, thus achieving a consistent effluent quality and encouraging the growth of desirable micro-organisms.

Energy Savings

Since the ISBR system was installed at the resort, the wastewater treatment plant has used less than 10 percent of the power for solids treatment than the originally proposed aerobic digester would have used. The ISBR system has also minimised solids wasting from the plant to less than 0.1 pounds of biological solids per pound of BOD treated. A single integrated control system from Siemens optimises overall plant performance and serves as a single point of contact for the treatment process. It also balances the ISBR system operating conditions, over the widely varying loads, to help maintain effluent quality and minimise solids production.

Conclusion

Globally, we find ourselves in the midst of a "green" movement, and are challenged to find better ways of managing our natural resources and reducing the negative impact on the environment. The Omniflo ISBR is a sustainable solution that offers effective wastewater treatment while significantly limiting of amount of waste produced and energy consumed in the process. By reducing its power consumption and solids wasting, a resort in California is doing its part to support this green initiative.

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