> *"Great communities don't just happen. They evolve from careful planning, smart design and listening to what people want."*
>
> —PEC Development Group

MBR System Takes Center Stage in Community Development

Great communities need great wastewater treatment. In January 2004, Enviroquip, a division of Eimco Water Technologies, was selected to provide all equipment, instrumentation and technical support services for a new membrane bioreactor (MBR) wastewater treatment plant (WWTP) in southern Forsyth County, Ga. James Creek is a master-planned community emphasizing outdoor recreation, including nature trails, certified wildlife habitats and a state-of-the-art tennis center.

By Christopher Lewis

Built to support the growing community, the Enviroquip MBR process was selected for its effluent quality, small footprint, low maintenance, simple operation and flexibility for plant expansion.

Phase I operations began in February 2006. The plant is currently treating 170,000 gal per day (gpd). James Creek joins The Hamptons as Forsyth County's second community to enjoy an Enviroquip MBR plant. The Hamptons WWTP, built in 2003, also produces high-quality effluent from its local wastewater flow.

The new system will use water reuse & submerged membranes to produce high-quality effluent

Drivers

A statewide leader in water reuse, Forsyth County has already reaped benefits of the James Creek facility, particularly in lieu of the 2007 Georgia drought disaster. The plant is reusing almost 90% of the influent municipal wastewater. Reuse applications include a variety of public and private land irrigation applications. Currently, effluent quality remains stellar. After commenting that he has never received an effluent fecal lab report for the James Creek plant with more than zero colonies, current plant operator Steve Swenson said, "I'm very impressed."

The Process

As a planned community, James Creek developers are expecting a steady increase in flow to the plant as new homes are built and more families move to the area; the plant is fully prepared. By designing a modular system, additional equipment and cost are not required before the demand is apparent. Consequently, the developer's cost burden is eased as the plant optimizes treatment volume with existing equipment.

Using the concept of biohydraulics, the system was designed to exceed biological treatment objectives over the range of expected operating conditions. Ultimate expansion and completion of the James Creek WWTP required four independent process trains that include one anaerobic zone, one anoxic zone and one MBR zone for maximum flexibility. Currently, only one MBR basin contains installed Kubota submerged membrane units (SMUs). As flows increase, installation of additional units—a relatively simple procedure—will boost production capability.

Quality, Flexibility & Reliability

Another advantage James Creek has over more conventional plants is the ability to operate under very low flow conditions, a real condition during the early stages of low-density community development.

Using Kubota SMUs, Enviroquip designed each train in the MBR system to handle average daily flows of 250,000 gpd for an ultimate total of one million gal per day (mgd). Achieved treatment goals include effluent biochemical oxygen demand less than 3 mg/L, total nitrogen less than 8 mg/L and total phosphorus levels less than 0.13 mg/L. The ability

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to accommodate such tight limits gives operators time and confidence to manage system upsets.

The ability to operate the plant manually in the event of an emergency provides another level of reliability that can be invaluable. Unlike many membrane systems that require complex automation and constant adjustments, the plant can be run in a manual mode to protect against power surges, brownouts or a loss of network communications that may temporarily interrupt automation (even with necessary built-in redundancy).

No Compromise

The low-cost, minimal system footprint and ability to produce reuse-quality effluent within an outdoor-centric family community demonstrates the ability of MBR systems to be competitive and reliable alternatives to conventional technologies. Because award-winning community development means a good quality of life for residents and straightforward, eco-friendly municipal services, James Creek WWTP proves that MBR systems are not just on the forefront of technology, they are on the forefront of the American dream. WWD

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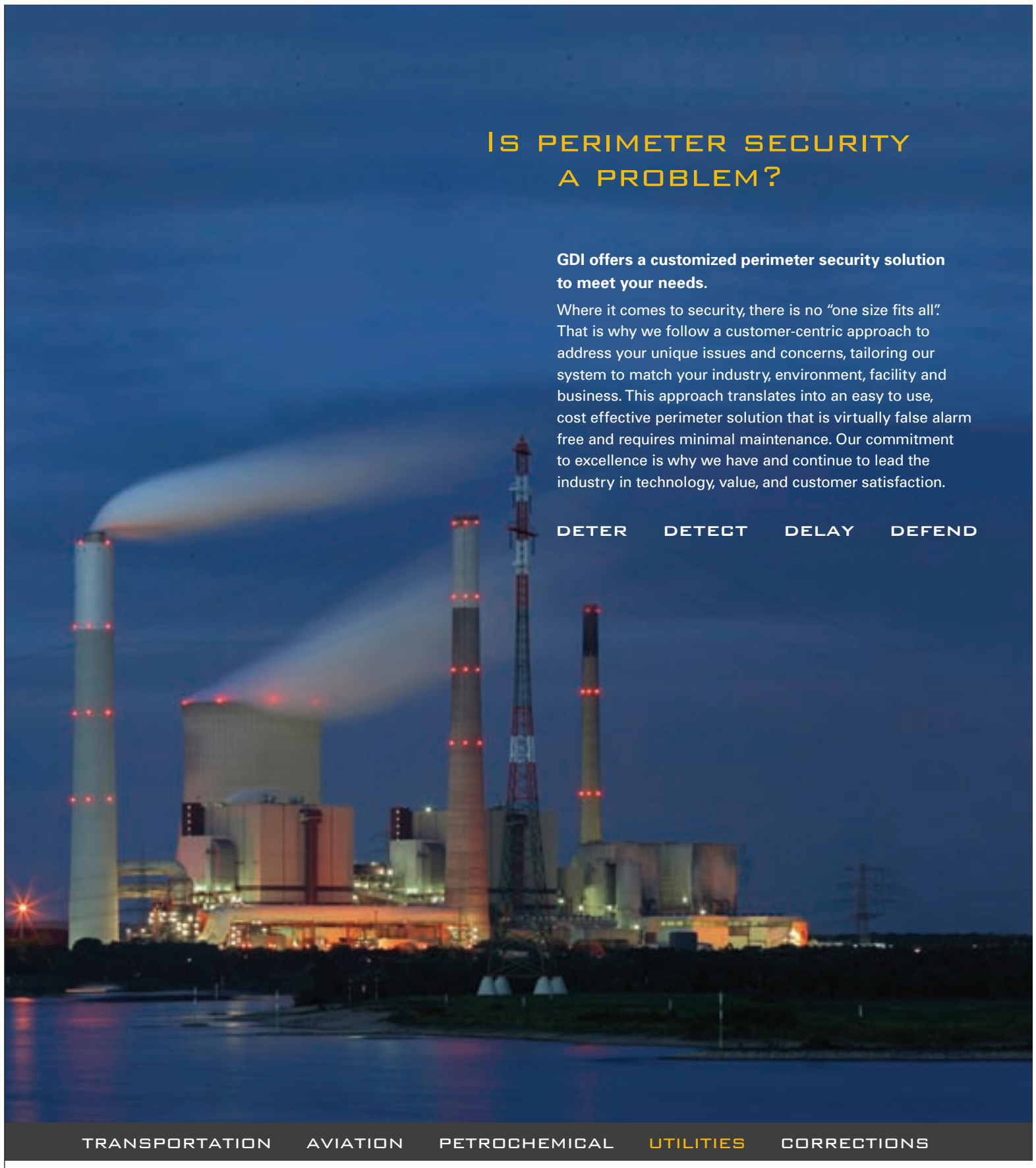

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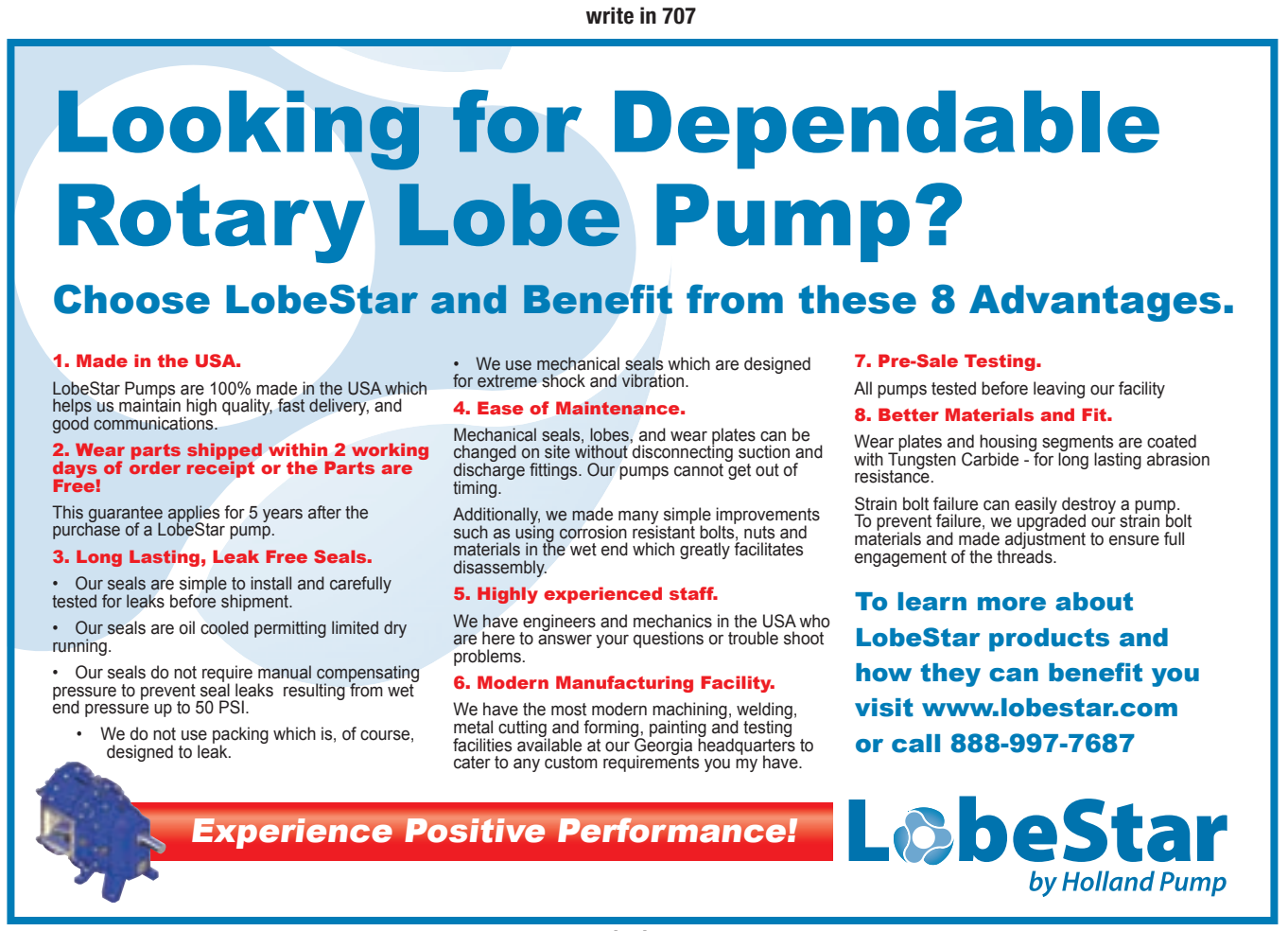

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