

Water at the Beach

Hotel resort reuses its greywater with new treatment solutions

By Nick Nicholas

Greywater typically consists of shower water, sink water, dishwater and laundry water, which comprises 50% to 80% of domestic wastewater consumption in a hotel or resort property.

Resort property owners and operators typically understand water conservation, as they feel the cost of excess water usage and water mismanagement on their financial bottom line. The use of recycled water can have a significant impact on operating costs and profitability, especially in regions of high water costs. Water conservation is particularly important in arid climates where lavish foliage and landscaping is mandatory for the resort's appearance and guest experiences.

Reusing Greywater

There is a growing number of resorts and hotels being built to Leadership in Energy & Environmental Design (LEED) standards around the world. LEED is a specialized building code system implemented by the U.S. Green Building Council that acknowledges energy-efficient, sustainable construction design and methods.

A significant element of a LEED-compliant building is water efficiency. Therefore, implementing sustainable greywater systems has allowed property operators and owners to claim they are taking proactive steps to take care of the local environment that will be beneficial for not only the resort, but also its guests and the surrounding communities.

Challenges at the Resort

A mid-sized coastal resort operator required an efficient way to reuse the resort's greywater to reduce its potable water consumption used for non-drinking purposes such as landscaping irrigation, cooling towers and laundry operations, among others.

The operator also wanted to see if the resort could reuse the wastewater from an existing desalination system using a beach well water source to optimize the total water resources currently available.

This particular project consisted of two new systems: a desalination system capable of treating 350 to 400 cu meters per day, and a greywater reuse system capable of treating 350 to 400 cu meters per day.

The beach well feedwater quality consisted of the following:

- Total dissolved solids (TDS): 4,680 mg/L;
- Hardness: 2,100 mg/L;
- Silica: 200 mg/L;
- Turbidity: 25 ntu; and
- Sulfate: 200 mg/L.

Disinfection & Desalination

Genesis Water Technologies (GWT) requested a water analysis to analyze the composition of the beach well water source that would need to be treated. Another analysis of the typical composition of the resort's greywater stream was conducted.

Results of both water analyses were reviewed in detail to determine an optimized solution based on the specific type and levels of contamination in each water source. There were elevated levels of turbidity and TDS consisting of hardness, sulfate and silica in the beach well water source.

GWT's local partner consulted with the client and provided a presentation overview and diagram of the customized solution to meet the client's water quality challenge.

The customized system solutions included primary/secondary and tertiary disinfection for the greywater, along with two desalination systems (a primary as well as a secondary system, to recover a portion of the primary system's wastewater stream). Optimized antiscalant chemical dosing and filtration was utilized to purify the beach well source.

The system was installed and commissioned by local project management and a contractor, with technical assistance provided by GWT.

The treated water quality met the client's parameters for both its potable and non-potable water consumption needs. The treated water streams were microbiologically safe.

The waste brine stream from the primary desalination process was utilized and the wastewater from the secondary system was disposed of in accordance with local regulations.

The systems performed within operating parameters set by the client. The client experienced increased system efficiency and reduced its effective operational cost. **IWWD**

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