

## Sustainability Is More Than A Buzzword For Wastewater Treatment

*By Lauren Fillmore, WERF Program Director  
Optimization of Wastewater and Solids Operations*

Sustainability is a popular buzzword, but its definitions and applications can be nebulous and overwhelming. In essence, sustainability means that something can occur indefinitely without a negative impact. That sounds all well and good, but what does it mean in the real world? And how do wastewater treatment facilities achieve it?

Sustainability meets today's and *tomorrow's* environmental, economic, and social needs.

On the environmental aspect, wastewater treatment obviously needs to protect sources of drinking water, aquatic life, and recreational uses of waterways. The wastewater industry must also minimize air emissions (such as methane and nitrogen greenhouse gas) and mitigate other impacts resulting from energy and chemical use.

Plant managers must weave economic considerations into every decision and find the best balance between multiple goals: achieving effluent quality requirements, planning for add-ons that will meet future effluent requirements, using all resources (i.e., powering equipment with methane), and optimizing the use of external resources (such as chemicals and electricity).

Sustainability also has social aspects. The concept may have different meanings for different stakeholders, but it essentially boils down to education. Wastewater treatment managers will find community acceptance comes easier when they understand the reasoning behind technology choices, especially when the decisions are between a fix that is fast and cheap or something that may take longer to implement but that will prove more beneficial in the long run.

The Water Environment Research Foundation is examining these aspects of sustainability. One WERF project, started this summer, is identifying and measuring key factors that contribute to the sustainability of a wastewater treatment facility. The project, *Improving the Wastewater Plant Environmental Footprint: Options for Your Locality*, will create a standardized approach to

defining metrics, collecting data, and making calculations. It will help wastewater treatment plants define their current carbon and ecological footprint as they take timely and truly effective steps towards reducing impact. The project includes a template for collecting information on the mass, energy, and ecological footprint of wastewater treatment facilities on a unit process basis. That information will support a database that plants can use to match their processes and, in effect, “build” their own facility. The tool’s unit processes will provide a customized analysis of the areas that can be further optimized towards sustainability.

CH2M HILL is leading the research project and is gathering input from European experts. They are currently testing the new tool to ensure that the results accurately capture the most important metrics of a facility.

The researchers selected the Strass wastewater treatment plant (WWTP), near Innsbruck, Austria, as a case study. The Strass WWTP has achieved a lofty goal that the rest of the wastewater community aspires to: producing more energy than is needed to operate the facility. Through a two-pronged approach of continually exploring options to improve the plant’s overall energy efficiency and optimizing methane production from the anaerobic digesters, the plant is producing more energy than it needs to operate the entire facility. The Strass WWTP is an ideal candidate for testing the new evaluation metrics and establishing a benchmark in the database against which other facilities can compare themselves.

The mass and energy balance template containing the Strass WWTP data will be available in early 2009. WERF will subsequently develop an interactive Web-based self-evaluation tool to collect data from treatment facilities all over the globe and build the database for *Improving the Wastewater Plant Environmental Footprint: Options for Your Locality*.

WERF has several other projects underway, or scheduled for the near future, that will help utilities develop sustainable systems. We are examining ways to conserve resources, especially in improved energy efficiency of our wastewater treatment facilities. We want to reduce the amount of potable water used in treatment. We are exploring new processes and technologies to reduce discharges, releases, and byproducts. WERF is particularly looking to reduce the production of sludge, release of methane and nitrogen greenhouse gas, and the use of chemicals. We are also developing new insights on how utilities can reuse sludge, nutrients, methane, and treated wastewater.

The future of sustainability is now. The wastewater community understands that, although sustainability is a popular buzzword, a treatment plant needs to make a slew of practical decisions to meet its “sustainable” responsibilities to the communities it serves.

### **About The Author:**

Lauren Fillmore is the Water Environment Research Foundation's program director responsible for managing research on optimization of wastewater and solids operations. She has 30 years experience supporting Clean Water Act programs in industry and as a consultant. Prior to joining WERF, Lauren managed multiple technical support contracts with the U.S. EPA Office of Wastewater Management , providing the Municipal Technology Branch with technical support and outreach materials for wastewater treatment, collection systems, biosolids management, stormwater best management plans, and decentralized systems.

