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Wastewater Treatment Technologies

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Ron Smith
Sr. Principal Analyst

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Abstract

In an effort to help meet growing demands being placed on available water supplies, many communities throughout the United States and the world are turning to water reclamation and reuse. Water reclamation and reuse offers an effective means of conserving limited high-quality freshwater supplies while helping to meet ever-growing demands for water, with industrial waste management practices leading the way.

Industrial wastewater treatment technologies include physical, chemical, and biological processes such as oil-water separators, dissolved air flotation, clarification, filtration, and sludge handling technologies to name a few . Ultimately, the treated water can be utilized in internal reuse purposes or to meet the site discharge water quality requirements.

The chemical and energy process industries represent a very significant portion of water use in the private sector. But in general, most of these facilities use a large amount of water for a variety of purposes, including steam generation, cooling water, utility water, process water, etc. In addition, a significant amount of this water is returned to the environment in various water and wastewater streams, which are treated to meet environmental discharge standards. For overall water reclamation, wastewater treatment processes are employed either singly or in combination to achieve water quality goals.

PEP Report 288 reminds us that off-the-shelf industrial water management systems do not exist. Tailored strategies are needed for specific industries, applications, and sites. Water recycling based on recirculation of process water is normally only a viable option if contamination levels are low and water treatment is relatively inexpensive. Water recycling is less efficient for waste streams that are highly contaminated and/or contain substances that have a very diverse range of chemical and physical properties.

This report reviews over 80 wastewater treatment technologies to develop 32 wastewater treatment modules—16 for contaminant removal and 16 for solids handling, treatment, and disposal—to aid in the development of first-level capital and operating cost economics for use in determining wastewater treatment costs for chemical and industrial processes.

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IHS Customer Care:

Americas: +1 800 IHS CARE (+1 800 447 2273); CustomerCare@ihs.com
Europe, Middle East, and Africa: +44 (0) 1344 328 300; Customer.Support@ihs.com
Asia and the Pacific Rim: +604 291 3600; SupportAPAC@ihs.com