

# Effects of Hydraulic/Organic Shock/Transient Loads in Anaerobic Wastewater Treatment: A Review

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*Due to the practical process engineering implications of hydraulic/organic overloading, and the sensitivity of anaerobic systems to process instabilities, the scope of this review is limited to the effects of hydraulic and organic shock/transient loading on various anaerobic systems. The responses of anaerobic systems under dynamic conditions and the complex interactions of environmental factors including kinetic, thermodynamic, nutritional, and mass transfer limitations often make the monitoring and prediction of system instability complicated. Process engineering requires multiple process indicators for rapid monitoring of overloaded systems and the various aspects of process indicators during hydraulic/organic shock/transient loadings are extensively discussed in this review.*

**KEY WORDS:** anaerobic digestion, hydraulic, kinetics, organic, shock loading, thermodynamics, transient loading, wastewater treatment, volatile fatty acids

## 1. INTRODUCTION

### 1.1 Limitations of Anaerobic Digestion

Decomposition of biodegradable organic waste can occur both aerobically or anaerobically. The advantages of anaerobic digestion over aerobic processes include the conversion of wastes into a usable end product, methane, with

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