

## NOTE

# Seasonal Variations in the bacterial population in an activated sludge system

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**Abstract:** Diminishing groundwater sources and a growing need of municipal water in arid countries like Saudi Arabia underline the need for an increase in the reuse of treated wastewater. Treatment of wastewater must be reliable and must be subject to monitoring to ensure the public health, safety, and environmental protection. A one-year study was conducted at the Al-Khobar wastewater treatment plant to investigate the effect of seasonal variations of temperature and flow rate on the fate of indicator microorganisms. The raw sewage, secondary effluent, and chlorinated effluent were analyzed for the detection and enumeration of four standard microorganismic indicators: standard plate count, total coliform, fecal coliform, and *Clostridium perfringens* on a weekly basis. It was found that the microbial populations present in the wastewater are very much sensitive to the wastewater temperature and, to some extent, on the wastewater flowrate. The *t*-test analysis performed on mean population densities of the indicator microorganisms studied shows higher microbial populations during summer than in winter. The insight gained from this study may be applied to other similar treatment plants operating in this region.

*Key words:* *Clostridium perfringens*, indicator microorganism, wastewater reuse, seasonal variations, wastewater treatment.