

## ABSTRACT

Domestic septage, produced from septic tanks, cesspools, and other sanitation devices, is becoming an increasingly more important issue in Palestine. Septage waste haulers are experiencing difficulties in finding a convenient and legal septage disposal method. The present septage disposal methods are uncontrolled and pose a challenge to public health and environment because it is a high strength wastewater. Many Palestinian sewage works receive domestic septage of unknown quantity, quality and lack knowledge on potential impacts.

The aim of the research was to investigate the impact of domestic septage on the overall treatment efficiency of Albireh Wastewater Treatment Plant (AWWTP) based on the quantity and the characteristics of the septage received.

This research was accomplished by a comprehensive data analysis utilizing monthly laboratory report available at AWWTP followed by onsite data gathering on septage received. Septage daily flow rate was measured in different months, and a detailed sampling program was undertaken to determine the characteristics of the septage received and treated. Finally, ANAWIN, a German sewage works design software package, was used to simulate the impact of septage loads on the treatment efficiency, design and operational parameters of unit operations.

Based on the results obtained from the lab analysis, the impact of septage loads was assessed with special emphasis on the maximum septage load, aeration unit design parameters (sludge age, biosolids production rate, specific oxygen uptake rate), treatment efficiency and annual running costs.

The volume of septage received at Albireh wastewater treatment plant ranged from (115-176) m<sup>3</sup>/d; with an average value of 153 m<sup>3</sup>/d. Septage generation rate in Albireh city is approximately 1.2 m<sup>3</sup> per capita per year. The annual volume of septage in Albireh city is approximately 44.5 MCM/Y.

The septage waste received at AWWTP is of heterogeneous origin, though of domestic nature. Negative impacts on unit operations and deterioration of effluent quality might occur during winter season. The ANAWIN software package confirmed the conclusions. Further research should be carried out to explore the feasibility central facilities for septage management from Palestinian rural and urban areas. In this context, the various impacts of septic tanks on groundwater are highly recommended.

Finally, active and effective cooperation between municipal and village councils on one hand and technical and legal institutions on the other hand form a solid base for a sustainable septage management in Palestine.