

THE EFFECTIVENESS OF THE STORM WATER TREATMENT PLANT AT WARSAW
FREDERICK CHOPIN AIRPORT

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Summary

Airports maintenance exerts a considerable impact on surface waters due to an extensive use, particularly in winter, of anti-icing and de-icing chemicals, which are conveyed to surface waters with a storm water runoff. The effectiveness of the Storm Water Treatment Plant (SWTP) at Warsaw Frederic Chopin Airport was examined with reference to the following four pollution indicators: suspended solids, oil extract, TOC and total nitrogen (TN) which, in turn, were determined in view of the following factors: the technology of mechanical sewage treatment, aircraft fuel potentials to permeate storm water sewage, and the application of antifreezes and ice- and snowmelts such as glycols, acetates and urea. In 2002 thirty-one sewage samples were taken both at the inlet and outlet of the SWTP. The obtained data was analyzed with reference to the periods with and without the application of anti-icing and de-icing chemicals and the occurrence of precipitation. The highest amount of contaminant in the inflowing sewage was observed when the use of toxic chemicals was simultaneous with the snow- and rainfall and reached the following values: suspended solids – 159.0 mg/dm³, oil extract – 26.4 mg/dm³, TOC – 446.5 mg/dm³, TN– 142.1 mg/dm³. The effectiveness of mechanical disposal of suspended solids and oil extract in the SWTP was rather high and

remained at the level of 51.3–82.7% and 45.3–70.2% respectively, which resulted in the contaminant concentration in the effluent below standard values i.e. 100 and 15 mg/dm³. The effectiveness of TOC and TN removal remained relatively low from 3.1 to 32.6% and from 8.0 to 32.6% respectively, which is understandable since the SWTP was not designed to remove TOC and TN. To reduce the discharge of large loadings of nitrogen (TN) and organic compounds (TOC), when its concentration exceeds 40 and 30 mg/dm³, respectively, it is recommended to direct the storm water sewage to municipal sanitary sewers.