

ECOTOXICOLOGICAL EVALUATION OF THE WASTEWATER AND SLUDGE SAMPLES FROM THE WASTEWATER TREATMENT PLANT OF THESSALONIKI, GREECE

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EXTENDED ABSTRACT

The LUMISTox[®] toxicity test was used for the ecotoxicological evaluation of samples deriving from the wastewater treatment plant of Thessaloniki. This test is based on the inhibition of luminescence emitted by the *Vibrio Fischeri* bacteria. Sampling points of interest for this study were the entrance of the unit (raw wastewater, RW), the exit of the secondary sedimentation tank (SSE) and the final dewatered sewage sludge (FS), from a wastewater treatment plant that serves about one million people by treating daily 150.000 tns of raw wastewater. Sampling period was September - December 2002. For the sewage sludge samples, elutriates were taken according to the Dr. Lange LUMISTerra procedure. Wastewater samples required only filtration through a 0.45 polysulphone membrane and adjustment of pH to 7 ± 0.2 and of salinity to 2-4%.

The results obtained show that the inhibition of luminescence is higher in the sewage sludge aquatic elutriate ($\simeq 65\%$). In the wastewater samples (RW and SSE) the inhibition is higher in the RW ($\simeq 30\%$) and reduces to the half at the SSE ($\simeq 15\%$). $EC_{20/50}$ values were calculated for 15 and 30 minutes incubation time and as expected the lower values were observed in the FS samples. Toxicity units and toxicity indexes were also calculated for the FS samples.

In this study, the correlation coefficients between the toxicity values and conventional parameters of a wastewater treatment plant such as BOD, COD, TOC, TSS etc are also presented.

Key words: Ecotoxicity, LUMISTox, bioluminescence, toxicity index, toxicity unit, wastewater, sludge, TOC