

Advanced systems for the enhancement of the environmental performance of WINeries in Cyprus (WINEC)



Deliverable 7

Report on winery wastewater and flows characterisation



Summary

The present study deals with the identification of the physical and chemical characteristics of wastewater produced from wine production. Specifically, the following parameters have been determined: pH, Total Solids (mg/L), Total Volatile Solids (mg/L), Suspended Solids (mg/L), Suspended Volatile Solids (mg/L), Biochemical Oxygen Demand (BOD₅) (mg/L), Chemical Oxygen Demand (COD) (mg/L), Total Nitrogen (mg/L), Total Phosphorous (mg/L), fats and oils (mg/L), phenolic compounds (mg/L) and heavy metals.

Winery wastewater effluents were taken from Tsiakkas winery in two different periods, i) September to October (vintage period) and ii) December to January (non-vintage period). In addition winery wastewater effluent was taken from a winery located in Paphos of Cyprus, which was firstly subjected to screening, sequential grid removal and biological oxidation in SBR to reduce both organic and solid contents, at the non-vintage period (October).

The main conclusions that can be drawn is that the pollution loads of the winery wastewater significantly change over the year, in relation to the working period (vintage, racking, bottling). At the vintage period the COD and BOD₅ levels are very high, due to the high levels of organic matter that the wastewater effluents contain. The organic content of winery wastewater consists of highly soluble sugars, alcohols, acids and recalcitrant high-molecular-weight compounds (e.g., polyphenols, tannins and lignins) not easily removable by biological means alone. On the other hand the levels of organic matter reduced at the non-vintage period, due to the fact that the winery wastewater produced only through the cleaning activities and there is no production of wine.

The biological treatment (Sequencing Batch Reactor - SBR) considerably decreases the organic content of the winery wastewater and the characterization of the winery wastewater effluent showed exactly that. The COD level of the wastewater effluent of the winery in Paphos before the biological treatment was 37300 mg/L O₂ and was reduced to 270 mg/L O₂ following the SBR treatment. This indicates the reduction of the organic strength through the biological treatment used.

For more information about the complete deliverable please send an email to lioann01@ucy.ac.cy or mvatyl@ucy.ac.cy.

