

## EVALUATION OF THE EFFICIENCY OF SPARTI'S UPGRADED AND EXPANDED SEWAGE TREATMENT PLANT

S. T. LYMPEROPOULOS , P. A. PARASKEVAS and T. D. LEKKAS

Department of Environmental Studies, University of the Aegean  
University Hill, Mytilene 81100, Greece  
E-mail: [ppar@env.aegean.gr](mailto:ppar@env.aegean.gr)

### EXTENDED ABSTRACT

The scope of the present study is to investigate the efficiency of the upgrading and expansion that took place at the Sewage Treatment Plant (STP) of the Municipality of Sparti, and was completed in September 2002. In this paper there is a description of the plant, as it existed primarily, analyzing the problems and the deficiencies that urged to the decision of its upgrading and enlargement. There is also a description of the unit in its present upgraded form. The plant layout (a system of extended aeration activated sludge) consisted before the upgrading of a preliminary treatment, a system of three aeration tanks with total volume of 1011.5 m<sup>3</sup> each (total volume 3035 m<sup>3</sup>), a settling tank with total volume 1101.8 m<sup>3</sup>, a chlorination tank, a system of thickening and mechanical sludge dewatering, a septage pretreatment system, and other smaller components. The expansion and upgrading of the Sewage Treatment Plant of Sparti was decided for a number of reasons, such as to satisfy the future population needs of the town, to correct defections at some parts of the initial plant, and to reduce the increased amounts of nitrogen ammonia and phosphorous in the effluent of the plant. The design was to adjust the effluent concentration limits at the following values: N-NH<sub>4</sub> < 2 mg/l, N-NO<sub>3</sub> < 10 mg/l, O-PO<sub>4</sub> < 5 mg/l. Before the upgrading the amounts of ammonia and orthophosphate highly exceeded those limits and that of course was due to the fact that no removal of N and P was conducted at the initial plant.

The main elements, which were added in the plant during its upgrading, were a biological phosphorous removal tank of total volume 1137 m<sup>3</sup>, a new system of aeration tanks of total volume 2200 m<sup>3</sup> and addition of one fourth to the already existing system of three (volume 1000 m<sup>3</sup>), a new settling tank with total volume 716.6 m<sup>3</sup> and other less important actions. Through a series of measurements, before and after the upgrading, is proved that the results of the whole operation were very satisfactory as far as concerning the efficiency of some basic pollutant removal, and the fulfillment of the rest goals that had been settled as well. For example an obvious diminution in the amounts of ammonia and orthophosphate at the outlet of the plant was observed, which fluctuated in the following levels: N-NH<sub>4</sub> = 3.5 mg/l and O-PO<sub>4</sub> = 3.5 mg/l. A study of a 4-month transitional period, when the system was in operation with a specific mode, is also included in this work. Finally measurements were made in Evrotas river, where the effluent is disposed, before and after the STP, showing in this way the amount of the pollution in the river because of the plant.

**Key words:** Sewage Treatment Plant, Sparti, upgrade, expansion, river pollution.