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ABSTRACT

TECHNICAL AND ECONOMIC OPTIMIZATION OF THE DEODORIZATION OF A COASTAL WWTP THROUGH BIOLOGICAL PROCESSES

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The Torredembarra WWTP (Tarragona, Spain), which services around 37.500 i.e., has suffered for years from noticeable odor emission problems and undesirable effects on the nearby population, mostly during the summer season. During previous years, the odor treatment in the WWTP relied on a series of physico-chemical systems (namely two chemical scrubbers, various activated carbon carboys and two conventional biofilters), which led to significant operating costs and which had variable efficiency.
In order to mitigate odor emission events and to guarantee the safety of the workers, a comprehensive restructuring plan for this whole treatment system was developed. The emission rates of the main odorous compounds in all the critical points of the WWTP were assessed during different times of the year. The most relevant emission points were then confined, and the headspace air extracted at an adequate rate calculated so to minimize venting costs while guaranteeing a sufficient air renewal rate. A series of air streams, with small flow rates and high concentrations of odorous compounds, were vented to four biotrickling filters, two of which are new (treating, respectively, the air from the sludge management and primary treatment areas), while the other two are the result of the retrofitting of two previous chemical scrubbers, connected in series, which treated the foul air from the primary settlers. Retrofittings were performed mostly following the strategy reported by Gabriel and Deshusses (2003). The main actions undertaken involved the modification of the control processes, the substitution of the packing material and of the recirculation pumps and the removal of the chemicals dosing devices. EBRT was set at 4.4 s for each of the retrofitted reactors, while EBRT values around 15 s were selected for the new biotrickling filters.
After these operations, consistent H_2S removal efficiencies higher than 99% are obtained in all four systems, even though inlet H_2S concentration reached values around 500 ppmv in the system treating air from the sludge management area. This led to a dramatic decrease of citizen complaints. Moreover, operating costs have been reduced by around 60%. The full manuscript will delve into the strategy followed and the specific characteristics of biological treatment equipment, while also exposing the main problems encountered during the operation of the bioreactors, as acidic drain.
REF: Gabriel D, Deshusses MA (2003). Retrofitting existing chemical scrubbers to biotrickling filters for H2S emission control. Proc Natl Acad Sci USA 100:6308–6312

Indicate preference of kind of presentation

- ✙ Oral Communication
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Indicate topic of your work for the conference:

- ☐ Policy and associated regulations for odour and air quality.
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- ☐ Odour/VOC perception, impact, formation and dispersion.
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