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**Rehabilitation of Oued Smar landfill into a recreation park: Treatment of the contaminated waters**

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**ABSTRACT:**

The main purpose of this study is to contribute to transform Oued Smar landfill (located in Algiers) into a recreation park with green spaces. To achieve this goal, the surface water and groundwater decontamination turns out to be vital to the success of this project. In order to achieve this objective, the effectiveness of the advanced oxidation process (AOP) by heterogeneous photocatalysis ( $\text{TiO}_2/\text{UV}$ ) regarding the landfill heavily-loaded water was tested. The analyses carried out on this water showed a recalcitrant organic matter to biodegradation. The results obtained after heterogeneous photocatalysis are relevant, an abatement of chemical oxygen demand COD of about 92% was recorded at a pH maintained at 5. However, the  $\text{NH}_4^+$  concentration remained stable at this particular pH. The results of the photodegradation kinetics modeling indicate that the reaction is therefore zero order independently of the pollutant load. However, this treated water remains non-compliant to be reused or directly rejected into the nature. The new ratios  $\text{BOD}_5/\text{COD}$  after photo catalysis treatments are favorable to a biological treatment. For the groundwater case, the AOP has proven to be able to make it conform to the standards and can thus be used as a spray water for the recreation park. The latter will assure the natural biopile effective performance that is the landfill, by, over time, reducing the pollutant contents and increasing the water quality of the new recreation park.