

## Treatment of pesticides containing effluents using organoclays/nanofiltration systems: rational design and cost indicators

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### ABSTRACT

Removal of hazardous pollutants from wastewater is an essential step for safe recovery and reuse. The immediate objective of this paper is to discuss functional requirements and design considerations of a nanofiltration (NF)-based system for the treatment of pesticide industry effluents and contaminated surface water. Techno-economic considerations for a 100 m<sup>3</sup>/d membrane filtration plant for the treatment of pesticide industry effluents and contaminated agricultural drainage water are presented. Metolachlor has been selected as the model for pesticide removal. The proposed system comprises membrane ultrafiltration (UF), NF, and adsorption of pesticides using modified clays such as organoclays. This paper is concluded with design guidelines and indicators pertinent to the treatment of pesticide-containing wastewater using NF systems. The estimated capital cost of a 100 m<sup>3</sup>/d treatment facility amounts to \$ 240,850. Further, the treatment cost is about \$1.77/m<sup>3</sup>.

*Keywords:* Pesticide; Metolachlor; Nanofiltration; Organoclay; Design; Cost

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