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# REMOVAL OF NONYL ETHOXYLATE SURFACTANTS IN WASTEWATER TREATMENT PLANTS

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**ABSTRACT:** A critical review has been conducted of the peer-reviewed literature on the ability of wastewater treatment plants (WWTPs) to remove nonylphenol ethoxylates (NPEs) and nonylphenol (NP) (Melcer et al, in press). It includes a discussion of case histories illustrating the fate of NPEs in WWTPs utilizing different treatment technologies. One of the major objectives of this review was to develop guidance on the factors influencing WWTP operations and on the optimum operating conditions to ensure effective treatment of these compounds. The NPEs are of interest because of their use in consumer and industrial applications and the common occurrence of their degradation intermediates in WWTP effluents. NPEs are unique among the commonly discussed emerging contaminants of concern because the U.S. Environmental Protection Agency (EPA) has finalized federal Water Quality Criteria (WQC) for nonylphenol (NP), their most toxic biodegradation intermediate. This provided the basis for a statistically-based assessment of environmental concentrations of these compounds and other related degradation intermediates over a 15 year period (Klecka et al, in press), which will also be presented. A major finding of this exercise, which examines both treatability and environmental occurrence, was that the advent of biological nutrient removal technology in municipal WWTPs during the 1990s paved the way for WWTPs to operate at high sludge retention times with the indirect benefit of providing the ideal environment for the breakdown of NPEs. Furthermore, the findings suggest that currently accepted WWTP performance standards, which result in the adequate treatment of NPEs and acceptable environmental concentrations of NP relative to EPA's WQC, may also be adequate to address other organic micropollutants of emerging concern.ReferencesKlecka, G. et al. (2007). Exposure Analysis of C8- and C9-Alkylphenol, Alkylphenol Ethoxylates, and their Metabolites in Surface Water Systems within the United States, J. Human Ecol Risk Assess (in press).Melcer, H. et al. (2007). Wastewater Treatment of Alkylphenols and their Ethoxylates, Report for the Alkylphenols and Ethoxylates Research Council, Washington DC. Water Environment Federation (in press).

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