

Occurrence and removal of endocrine disruptors in wastewater treatment plants for small communities

Sonia Dagnino^{a,b}, Bernadette Picot^a, Aurélie Escande^a, Patrick Balaguer^b, Helène Fenet^{a*}

^aUMR 5569 Hydrosociences, Université Montpellier I, Av. Charles Flahault, 34060 Montpellier, France

Tel. +33 (4) 67 54 80 86; Fax +33 (4) 67 54 86 95; email: sonia.dagnino@univ-montp1.fr; hfenet@univ-montp1.fr

^bINSERM, U896, "Signalisation Hormonale, Environnement et Cancer", Institut de Recherche en Cancérologie de Montpellier, CRLC, Val d'Aurelle, F-34298 Montpellier Cedex 5, France; Université Montpellier 1, F-34298 Montpellier, France

Tel. +33 (4) 67 61 24 09; Fax +33 (4) 67 61 37 87; email: p.balaguer@valdorel.fnielcc.fr

Received 23 April 2008; Accepted in revised form 24 September 2008

ABSTRACT

The current study examined the fate of endocrine disrupting compounds in three small communities' wastewater treatment plants (WWTP), including stabilization ponds, trickling filters and activated sludge. The results showed that WWTP of small communities were affected by estrogenic and dioxin-like compound contamination ranging from 1.6 to 50 ng.L⁻¹ estradiol equivalents and 5.3 to 73 ng.L⁻¹ dioxin equivalents. The stabilization pond system seemed to be the most effective for estrogenicity removal, with 96% efficiency, compared to 51% for a trickling filter alone. Total removal of estrogenic compounds was increased when a stabilization pond system was used as a finishing treatment or when an additional physical treatment was conducted. Activated sludge treatment removed 75% of dioxin-like activity. Additional physical treatment had no impact on dioxin-like compound removal. Although the large contact area with air in maturation ponds represents a risk for air contamination of the water, maturation ponds seemed effective for dioxin-like compound removal. The efficiency of stabilization ponds as a finishing treatment system for the removal of estrogenic and dioxin-like compounds should be taken into account when selecting wastewater treatment systems for small communities.

Keywords: Activated sludge; Endocrine disrupter; Estrogenic; Dioxin-like; Stabilization ponds; Trickling filter

* Corresponding author.

Presented at the 2nd International Congress, SMALLWAT '07, Wastewater Treatment in Small Communities, 11–15 November 2007, Seville, Spain