Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2018.23199

129 (2018) 319–324
October

PCDD/Fs profile and risk assessment in water and sediments around a non-wood pulp and paper mill when a chlorine bleaching treatment is applied

Qingcong Xiao[a,b], Hongchen Wang[a,*], Xiaoqian Song[b], Hanzheng Yuan[b], Yuanna Zhang[b]

[a]*School of Environment and Natural Resources, Renmin University of China, Beijing 100872, China, Tel. +86 10 82815266; Fax: +86 10 82156225; emails: hjbhqc@126.com (H. Wang), xiaoqingcon_g@126.com (Q. Xiao)*
[b]*CSD IDEA (Beijing) Environmental Test and Analysis Co., Ltd., Beijing 100192, China; emails: songxiaoqian@zchb.net (X. Song), yuanhanzheng@zchb.net (H. Yuan), zhangyuanna@zchb.net (Y. Zhang)*

Received 7 August 2017; Accepted 10 June 2018

ABSTRACT

Non-wood pulp and paper mills (PMs) with chlorine bleaching, which was identified as a primary pollution source of polychlorinated dibenzo-*p*-dioxins and furans (PCDD/Fs) in water environment, are still widely distributed around important rivers and lakes. The composition profiles and risk assessment of PCDD/Fs in water and sediments around a non-wood PM, in which a chlorine bleaching treatment is applied, were evaluated. PCDD/Fs concentrations in downstream water and sediments were 0.44 and 1.10×10^3 pg TEQ kg^{-1}, respectively, which were noticeably higher than these in upstream water and sediments. It is, therefore, important to take into account the cumulative effect of pollution by these effluent emissions from non-wood PMs. PCDD/Fs analysis provided further information about PCDD/Fs contamination from non-wood PMs. The environmental risk for fish in water and sediment was low, while for mammalian wildlife in water environment was high, with the risk quotient values higher than 7.00.

Keywords: PCDD/Fs; Congener profiles; Risk assessment; Non-wood pulp and paper mills

* Corresponding author.

Presented at 2017 Qingdao International Water Congress, June 27–30, 2017, Qingdao, China.