Fourth SETAC World Congress and 25th Annual Meeting in North America
14-18 November 2004, Oregon Convention Center, Portland, Oregon, USA
Abstract book, p. 315-316

PT140 Contribution of industries to sediment dioxin pollution in the channels around Makata Industrial Area, Japan.

Masunaga, S.[1], Nakasugi, O.[2], Miki, I.[3] and Masuda, Y.[4]

[1]Graduate School of Enviroment & Information Sciences, Yokohama National University, Yokohama, Kanagawa, JAPAN. [2]Cooperative Research and Development Center, Yokohama National University, Yokohama, Kanagawa, JAPAN. [3]Nittech Research Corporation, Himeji, Hyogo, JAPAN. [4]Shimane Prefectural Government, Matsue, Shimane, JAPAN.

Dioxin pollution in channel sediment around the Makata Industrial Area, Matsue, Japan was found in 2000. Shimane Prefectural Government conducted extensive monitoring of channel sediments and effluent from nearby industries to determine the spread and cause of the pollution. The pollution existed in upper 30 cm of the sediment and presence of multiple sources was indicated. Causal relation between pollution and individual industry, however, could not be established. In addition, dioxin levels in upstream of the channel were found to be exceeding the environmental quality standard (1 pg-TEQ/L), indicating that agrochemical use upstream was one of the cause. After the introduction of environmental quality standard for sediment (150 pg-TEQ/g) in 2002, remediation plan of dioxin pollution is now required. The Committee on the Dioxin Pollution around Makata Industrial Area established by Shimane Prefectural Government studied the contribution of the nearby industries on the pollution for the purpose of cost allocation. As it was impossible to calculate the contribution of individual industry, the committee decided to estimate the contributions of industry and agriculture as follows. The dioxin congener profile of Lake Nakaumi sediment, a background site, was first subtracted from that of each sediment sample from the channel. The average profiles of dioxin impurities in pentachlorophenol (PCP) and chloronitrophen (CNP) were further subtracted from the residual profile based on the hypothesis that all the 1,3,6,8-tetrachlolodibenzo-p-dioxin (1368-TeCDD) and octachlorodibenzo-p-dioxin (OCDD) in the sediment originated from CNP and PCP, respectively. 1368-TeCDD and OCDD were the most abundant dioxin congeners in CNP and PCP, respectively. Thus, the final residual profiles could be regarded as the minimum estimated contribution of nearby industries to the pollution. The estimate showed that the contribution of industries was .71% for total amount of dioxin in the channel sediment and .88% for the total amount of dioxin in environmental standard exceeding sediment.