

Mercury Contamination of Wetland Caused by Wastewater from Chlor-Alkali Industry

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Abstract : A significant mercury contamination of soil/sediment was unveiled by an environmental monitoring program in a wetland along La Plata River, west to Montevideo City, Uruguay. The mercury contamination was caused by industrial wastewater discharged from a chlor-alkali plant using a mercury-cell process. The contamination level is above 60 mg/kg in soil/sediment. Most of mercury (Hg) in the environment is inorganic, but some fractions are converted by bacteria to methylmercury (MeHg), a toxic organic compound. MeHg biologically accumulates through a food-chain and become serious public health risk. In order to clarify the contaminated part for countermeasure operation, an intervention value of mercury contamination of sediment/soil was defined as 15 mg/kg (total Hg) by the authority. According to the intervention value, mercury contaminated area in the La Plata site is approximately 48,280 m² and estimated total volume of contaminated sediments/soils was around 18,750 m³. The countermeasures to contaminated zone were proposed in two stages; (i) mitigation of risks for public health and (ii) site remediation. The first stage is an installation of fens and net around the contamination zone, for mitigating risks of exposure, inhalation, and intake. The food chain among wetland-river ecosystem was also interrupted by the installation of net and fens. The state of mercury contamination in La Plata site and plan of countermeasure was disclosed to local people and the public, and consensus on setting off-limit area was successfully achieved. Mass media also contribute to share the information on the contamination site. The cost for countermeasures was borne by the industry under the polluter-pay-principle.

Keywords : chlor-alkali plant, mercury contamination, polluter pay principle, Uruguay, wetland

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