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Environmental Lead and Nickel Contamination of Tank Rainwater in Esperance, Western Australia: An Evaluation of the Cleaning Program

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ABSTRACT

A significant number of birds in the port town of Esperance, Western Australia died in the summer of 2006/2007 and elevated lead levels were found in the kidneys, livers and brains of autopsied birds. These elevated lead levels alerted Government authorities to investigate the public health impacts of potential lead contamination in the community resulting from transport of lead carbonate from the Esperance Port. Water samples from domestic rainwater collection systems were collected to determine the extent of heavy metal contamination; 19% and 24% of tanks had lead and nickel levels above the Australian Drinking Water Guidelines. The aim of this study was to evaluate whether cleaning of rainwater tanks had reduced exposure to lead and nickel contamination in the community. Follow-up sampling of 176 tanks across Esperance indicated that there had been reductions in both lead and nickel concentrations, but that the reduction has been greater for nickel concentrations. The reduction in nickel concentration was significantly associated with cleaning status, whereas this was not the case for lead. Proximity to the Esperance Port was an important determinant of lead concentration. Tank and roof characteristics did not significantly influence the follow-up lead concentrations. The results suggested that there was ongoing contamination of rainwater tanks from the environment.

KEYWORDS

Lead Carbonate, Lead, Nickel, Rainwater Tanks, Environmental Exposure, Australia, Shipping Port

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