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## Metal fluxes in the Mersey Narrows

J. A. Cole<sup>1</sup> and K. Whitelaw<sup>2</sup>

Both authors formerly with WRc plc, Medmenham, Bucks, SL7 2HD; current addresses:

<sup>1</sup> 3 Grangefield Way, Aldwick, Bognor Regis, West Sussex, PO21 4EG.

<sup>2</sup> University of Portsmouth, Faculty of Technology, Anglesea Building, Anglesea Road, Portsmouth, PO1 3DJ

**Abstract.** Surveys of the Mersey estuary in north-west England were undertaken near the mouth of the estuary in the region known as the Mersey Narrows. Tidal fluxes of suspended and dissolved matter, particularly heavy metals, through the Mersey Narrows were investigated. This paper gives results of conducting four intensive cross-sectional surveys of the Narrows, during which currents, salinities, turbidity and water samples were obtained systematically at numerous positions, throughout selected tidal cycles. Over 300 water samples per survey were analysed to yield suspended and dissolved concentrations of the elements As, Cd, Cr, Cu, Hg, Ni, Pb and Zn, at all states of the tide. Suspended solids, concentrations and salinities were also measured. Suspended particulates account for the majority of each element present, except for cadmium, which was present in roughly equal dissolved and suspended fractions. From the tidal current and water quality data, calculations were made of hour-by-hour fluxes of each component, to show the detailed ebb and flow of heavy metals and the net tidal transport of each component. Although some differences between landward transport on the flood tide and seaward transport on the ebb were not significant, the more definite results consistently showed a seawards net transport. For spring tides of high tidal range, there was an indication of an opposite tendency, reducing the seawards transport or even reversing it, for certain suspended components.

**Keywords:** Mersey estuary, surveys, tidal flux, dissolved metals, particulate metals, salinity, suspended particulate matter, suspended solids

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