The impact of stormwater discharges on freshwater, marine water and marine sediments and the implications for environmental management of the Pauatahanui Inlet, Porirua, New Zealand.

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ABSTRACT

A survey of Cu, Pb, Zn and Cr levels in sediment cores taken at four locations in the Pauatahanui Inlet has been undertaken in conjunction with a freshwater and marine water quality survey.

Levels of heavy metals in sediment were within the Australian and New Zealand Guidelines for Fresh and Marine Water Quality for the protection of Aquatic Ecosystems, [Interim Sediment Quality Guideline (ISQG) (high level of protection)]. Sediments in the vicinity of discharges from suburban catchments showed higher levels of Cu, Pb, Zn and Cr than those in the vicinity of rural catchments.

Levels of Cu, Pb and Zn in streams in the suburban catchments exceeded guideline levels for 99% species protection on occasions, and guidelines for Cu, Pb and Cd were exceeded in marine water. Elevated concentrations of heavy metals in marine and freshwater coincided with rainfall events and increased suspended sediment levels, indicating stormwater discharges as a contributing source of the contaminants.

Levels of N and P exceeded guideline trigger values in freshwater tributaries on occasions. There was no distinct difference between the rural and suburban catchments in terms of nutrient levels detected.

Levels of bacteria present (E-Coli and Enterococci) exceeded NZ guideline levels for contact recreation purposes after rainfall events.

Heavy metals in stormwater were attributed to transport sources. Control of these discharges will likely be ‘end of pipe’ in nature due to the diffuse nature of the heavy metal inputs, and the difficulties in controlling emissions from vehicles at source.

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ACKNOWLEDGEMENTS

This study was commissioned by the Wellington Regional Council (WRC), upon identification of the need for more data about the contaminants in the urban runoff which is discharging into the Pauatahanui Inlet. The significance of this information when identifying environmental pressures on the Inlet is clear. The reason for this study was a need for site specific information upon which to base policy, planning and environmental management decisions. I would like to take this opportunity to thank the WRC for supporting this research.