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The impact of the closure and decommissioning of the Wainuiomata Waste Water Treatment Plant on the water quality of the Wainuiomata River.

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by

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ABSTRACT

The quality of the Wainuiomata River (particularly downstream of the Wainuiomata Waste Water Treatment Plant) has been affected over the years (e.g. eutrophication) by a number of contaminants, such as nutrients and faecal bacteria. The main source of these contaminants has been the treated effluent discharged into the river from the Wainuiomata Waste Water Treatment Plant (WWTP). The WWTP has been discharging treated effluent into the river since the 1950's. This sewage treatment plant was decommissioned in November 2001 and is now used solely as a pumping station. Sewage from Wainuiomata is now piped over to the new sewage treatment plant in Seaview. This research project aimed to examine the impact of the WWTP closure on the water quality of the Wainuiomata River.

Water samples were collected from a number of selected sites over a period of three months: January 2003 to March 2003, above and below the WWTP site. For this particular study, the microbiological, chemical (nutrients) and biological parameters were assessed as follows: *Escherichia coli* and total coliforms (microbiological) dissolved reactive phosphorus (DRP), nitrate nitrogen and ammoniacal nitrogen (chemical) and periphyton (biological) for biomass and taxa identification. The results for each of the above parameters sites were compared with historical data obtained from Greater Wellington Regional Council (2003).

Overall this research has shown that the closure of the WWTP has impacted on the J5 site (Golf Course), which is downstream of the WWTP, in a number of ways. The chemical indicator levels (NO_3-N, NH_4-N and DRP) have dropped significantly; periphyton was still in abundance at site J5 (no real improvement seen) and the median level of the microbiological indicator, *E.coli* has reduced. However, site J5 on a number of occasions, did not comply with the Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas (2003). Sites sampled upstream of the WWTP, particularly the tributary sites (Black Creek and Wainuiomata Stream), also did not comply with the guidelines on a number of occasions. This is a concern, as the public are known to swim near where these tributaries enter the Wainuiomata River. The effects of storm water or land runoff may have affected the results on two occasions (when there had been rainfall) however, on all other occasions where high *E.coli* levels

were observed, the effects of storm water and runoff would have been minimal, as there had been very little rain.

The Wainuiomata River is used for recreational activities such as swimming, canoeing and fishing; therefore an important resource. Any water quality concerns (namely, *E.coli* levels and periphyton proliferation), therefore need to be monitored by the Greater Wellington Regional Council and actions taken to eliminate these concerns.

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DEDICATION

I dedicate this thesis to my children, Katherine, Michelle, Vanessa and Daniel (who have put up with all my years of study), my husband Chris and my parents Pat and Albert Sheppard and family for their love and support. I would like to finally dedicate this thesis to my special friend and helper Our Lord Jesus Christ, who believed in me.

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