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Report to the Rural Services and Wairarapa Committee
from Brett Stansfield, Water Quality Scientist

Motuwaireka Stream Water Quality Survey - Riversdale

1. Purpose

This report provides a summary of an intensive bacteriological water quality survey of the contributing tributaries of the Motuwaireka Stream catchment for the period 22 September 1999 to 17 May 2000.

2. Background

- 2.1 The lower reaches of the Motuwaireka Stream (commonly called the Riversdale Lagoon) has had water quality unsuitable for bathing since the 1996 bathing season (Stansfield, 1997, 1998, 1999, 2000).
- 2.2 On January 24 1996 a press release was made and on 26 January 1996 a sign warning of pollution was erected by the Masterton District Council at the Riversdale Lagoon.
- 2.3 On February 4 1999 the Regional Council agreed to pursue a sanitary survey of the Motuwaireka Stream. The prime objectives of this study were to:
 - Identify areas within the Motuwaireka Stream catchment which have impaired water quality
 - Identify the possible sources of contamination
 - Identify methods to improve water quality of the Motuwaireka Stream

3. Methods

- 3.1 Sites for sampling were selected in consultation with the local Riversdale community as it was thought that local knowledge would be of assistance to identifying “hot spots” within the catchment.
- 3.2 Land use within the catchment since 1943 was compared with the present to identify what contribution land use changes may have had on the water quality of the Motuwaireka Stream.

- 3.3 A tracer dye test was trialed on two septic tank systems which are in close proximity to the lagoon to determine whether the disposal fields were contributing to water quality contamination.
- 3.4 Water quality sampling was undertaken following high rainfall events as previous reports have identified that this is when high bacteria counts are observed in the lagoon. Water was tested for:
- E.coli and Enterococci bacteria
 - On site measurements of Conductivity, Salinity, Water Temperature and Turbidity
 - Faecal sterol testing on one occasion. The faecal sterol test is a new technique which determines whether the contamination observed is of human or animal origin.

4. Results

- 4.1 There have been considerable changes to land use and vegetation within the Motuwaireka Stream catchment. Most notable is the decline in indigenous scrub cover and gorse.
- 4.2 Although the Motuwaireka Stream does not have significantly poorer water quality compared to another reference stream (Waihora Stream), there are sites within the catchment which generally have poorer water quality compared to the remaining sites. Poor water quality sites include the Riversdale Dump, Homewood Turnoff and YMCA sites.
- 4.3 The tracer dye test conducted on two popular camp ground septic systems did not detect the disposal fields direction and no dye was observed to enter the stream.
- 4.4 The faecal sterol fingerprinting test indicated that the contamination of the Riversdale Lagoon is of predominantly animal origin.
- 4.5 Previous groundwater monitoring indicates that it is unlikely that groundwater is a significant contributor to the elevated bacteria concentrations recorded in the Motuwaireka Stream.

5. Conclusions

- 5.1 Improvement of water quality in the Motuwaireka Stream cannot be achieved through a few one off actions. A gradual improvement is likely to be achieved through the combined application of a number of restorative measures such as
- Establishment of riparian plantings and fencing off of key tributaries of the Motuwaireka Stream catchment. This will reduce the effects of stock wandering and agricultural runoff to this sensitive receiving water. Methods 31 and 32 of the Regional Policy Statement (Freshwater Chapter) gives provision to employ riparian plantings for the enhancement of water quality.
 - The backwater of the lagoon in which the YMCA site is located needs to be machine cleaned as the sediments are likely to contain a range of contaminants. Ideally the sediments extracted from this backwater should be disposed of.

- The upper reaches of the stagnant backwater may be able to be engineered so that it flows freely out to the lagoon.
- A community wastewater treatment system should be installed for all residences before any further development in the area occurs.

5.2 Ideally areas within the catchment which show severe bank erosion and stock trampling should be targeted for riparian plantings and fencing first. Community involvement is the best way to undertake such projects as they will also promote 'kaitiakitanga' of the stream. We are fortunate to have such a proactive community at Riversdale who are prepared to make the effort to improve water quality of the stream. This is evident in their current voluntary workings of the lower Riversdale esplanade reserve.

5.3 Although previous investigations indicate that groundwater is unlikely to be a significant contributor of elevated concentrations of bacteria in the Motuwaireka Lagoon, a precautionary approach needs to be employed with regards to the wastewater treatment operations in the Riversdale area. Ideally a community wastewater treatment scheme will address this potential problem.

6. Recommendation

- (1) *That the report be received.*
- (2) *That the restorative measures mentioned in this report be considered as options to improve the water quality of the Motuwaireka Stream.*

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