



## STAFF REPORT

**TO:** Environment & Planning Committee

**FROM:** Trevor James, Resource Scientist

**REFERENCE:** W416

**SUBJECT:** **SUMMER 2010 / 2011 RECREATIONAL WATER QUALITY SAMPLING PROGRAMME - REPORT** - Report prepared for Meeting of 2 June 2011

---

### 1. INTRODUCTION

This report outlines results of bathing water quality monitoring at four of Tasman's most popular beaches (Pohara, Kaiteriteri, Mapua and Rabbit Island) over the 2010/2011 summer.

Bathing water quality monitoring in Tasman District has been ongoing since the mid-1990s. During that time about 65% of sampling sites in the programme have been sampled consistently with other sites being surveyed for short periods and then dropped because of consistently good water quality. However, in order to ensure we get some water quality information at lesser-used sites or sites with lower risk of faecal pollution, additional short-term investigations have been carried out. Where it is found that there are on-going issues, such as Tukurua, those sites may be brought into the programme. Pohara Beach was introduced as one of the core every-year sampling sites for the first time this season. A minimum of twenty samples are required per year at these four sites in order to compute beach grades.

Since the 2006/2007 season the decision was made to only take samples at the full suite of sites every second year, and in the alternate year only the few most popular beaches are sampled. This allows resources to be available for a sanitary survey (source identification) or other bathing-water-quality-related work. This past summer the staff time and resources available in lieu of not sampling the full suite of sites, a survey was carried out investigating the relative usage of bathing beaches and swimming holes as well as opinions of users about the effects on their experience (see separate report).

As in the 2008-09 monitoring season, we were able to achieve considerable efficiency of sampling effort by combining forces with the Engineering Department, who coincidentally had a summer student doing work at Kaiteriteri every Tuesday (the same day when recreational water quality sampling is carried out). As 80% of the sampling effort is in driving time, this was a considerable saving.

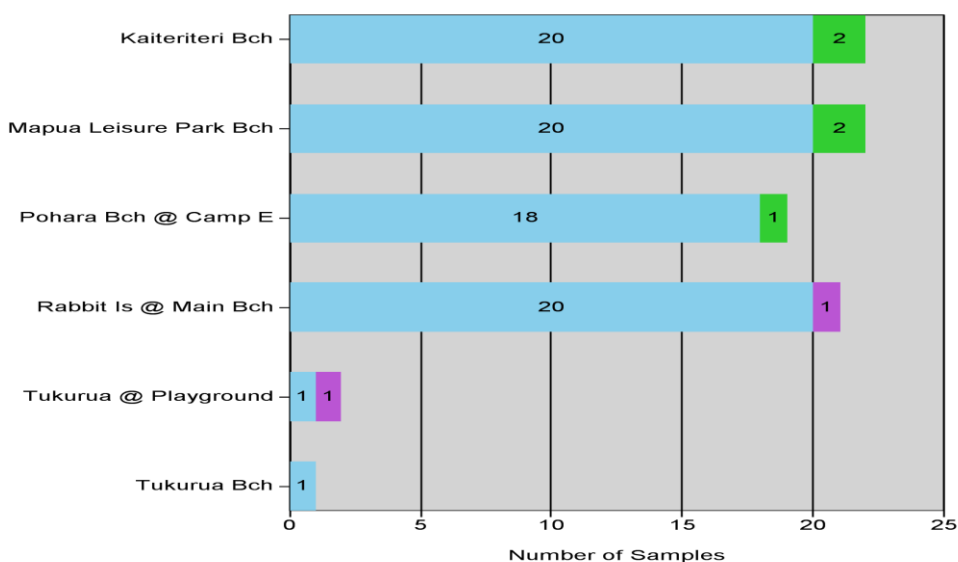
The full suite of sites (23) covering both river and marine areas in Tasman and Golden Bay will be sampled again in the 2011/2012 summer.

Council results were posted on the Council website within three days of each sampling event (see <http://www.tasman.govt.nz/environment/water/swimming-water-quality/>). Further information is available on this website about the sampling sites (including maps and photographs) and background to the monitoring programme.

## 2. RESULTS AND DISCUSSION

### 2.1 Season Summary

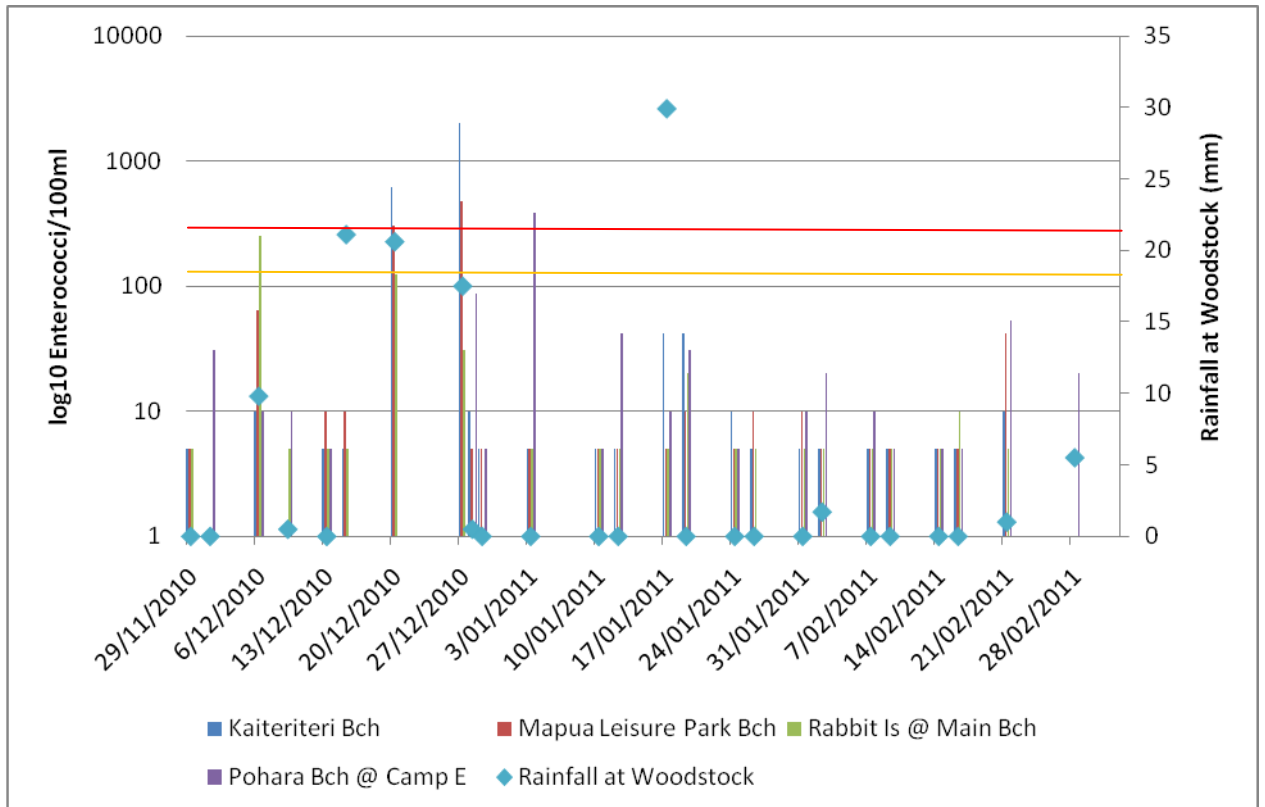
A total of six exceedences of national guidelines<sup>1</sup> were recorded across the four sites (Pohara, Kaiteriteri, Mapua and Rabbit Island) sampled in the 2010/2011 season. This was out of a total of 85 samples taken. This equates to about 7% of samples exceeding guidelines (see Figure 1). Of these exceedences, all except one were above alarm levels (the highest level). However, all results of follow-up samples taken within one-two days of the exceedence were back down to the typical very low levels (near the lower level of detection).



**Figure 1: Number of samples exceeding national guidelines for contact recreation water quality at marine beaches for the 2010-11 season.** Green shows results over alarm levels (>280 *Enterococci*/100ml) and purple shows results over alert levels (140-280 *Enterococci*/100ml).

All exceedences were associated with rainfall over 10mm in the catchment in the day prior to sampling. Four of these exceedences were after significant rain on 21 and 28 December at Kaiteriteri and Mapua (see Figure 2). The result for Rabbit Island on 21 December was just below the alert level.

<sup>1</sup> Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas, Ministry for the Environment and Ministry of Health, June 2003. ISBN: 0-478-24091-0



**Figure 2: Bathing water quality (*Enterococci*) results for four marine beaches sampled in 2010-11 plotted against rainfall.** Alarm and alert level indicated by red and orange lines respectively.

## 2.2 Warning issued for Kaiteriteri Beach

One result at Kaiteriteri on 28 December was very much higher than guidelines and above detection (>2000 *Enterococci*/100ml) and cause for concern as large numbers of people use this beach at this time of year. Due to the magnitude of this exceedence and the number of people potentially affected, it was decided on 29 December, in consultation with the public health service, that warning signs should be erected at the beach. Re-sampling was undertaken with a few hours of receiving the sample result on 29 December, and again on 30 December. Both these follow-up results were clear (at or near the lower detection limit). However, the delay in sample results being available for these follow-up samples (provided on 31 December and 1 January respectively) meant that we could not wait for these results before erecting the signs. The signs were only up for two days and taken down as soon as the result came through showing water quality had returned to within guidelines. The Kaiteriteri Domain Board was notified soon after we received the result of the exceedence.

Council and the DHB came under criticism through the media (Nelson Mail Dec 31, 2010) that the signs were only a token effort and that there should be staff on the ground warning about poor water quality. Criticism was also levelled that the warning signs went up a too late. Many swimmers appeared to ignore the signs anyway, partly because they had not seen them.

### **2.3 A proposal to develop a system for real-time warnings**

The lag time before warnings are issued is a common problem world-wide, but there is a potential solution for part of our region. We have the opportunity following extensive research as part of the Motueka Integrated Catchment Management (ICM) programme to model faecal indicator bacteria concentrations and announce warnings based on modelled results. This is only useful for bathing sites on the lower Motueka River and within the river's coastal plume. This plume in a moderate (3-6 month return-period) flood can extend from the Motueka River mouth to Marahau Beach in the north and Kina Beach in the south-east. Rather than an evenly spread plume the wind and tide push the plume in one or other direction.

Envirolink funding has been approved for this project using Cawthron as the service provider. The model will use real-time data, such as river flow (Motueka at Woodmans Bend), as well as turbidity, solar radiation and current speed, from the Tasman Bay monitoring buoy in combination with existing coastal circulation models. It is hoped that the project will commence in July and be completed prior to the next bathing season. However, the accuracy of the model and therefore its usefulness will not be known until the project is completed. More flood-flow data may be needed for the lower river concomitantly with data from marine beaches within the plume to validate the model.

It is hoped that the model can run alongside our telemetry system and sent a txt message to the duty officer who will initiate a response. It is recommended that a roster be set up during the holiday period for duty Council officers to respond to exceedences following a txt message from the laboratory. The Kaiteriteri Domain Board is happy to erect and remove the temporary signs at Kaiteriteri and possibly neighbouring beaches.

Warning people by patrolling the beaches was discussed with the public health service, but it is recognised that this could be onerous as the patrols would have to be over the whole day following the alarm. Radio announcements should be considered.

### **2.4 Tukurua Stream**

Over the past year results show that there are ongoing faecal contamination issues in Tukurua Stream with 3 out of 6 results in the last 7 months being above recreation water quality guidelines (2 of these being very high). All samples taken show there is no source of contamination upstream of farmland so this excludes the possibility of feral animals in the Department of Conservation estate as contributing to the source.

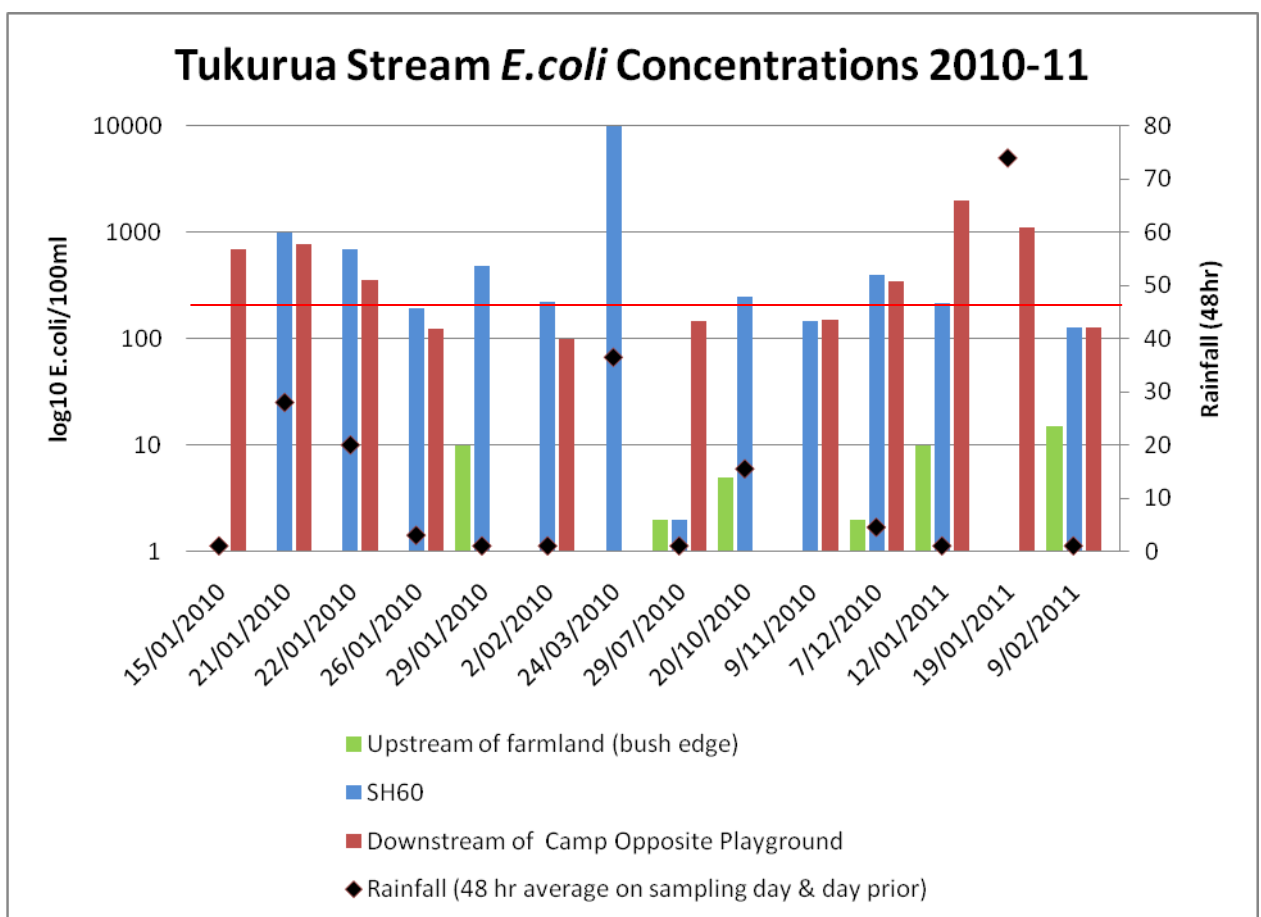
All samples taken except those on 29/2/10 (these were within guidelines) and 12/1/11 shows a higher or similar result at SH60 than the site near the mouth (at the downstream end of the campground) suggesting the major source is upstream of SH60. Rainfall certainly has caused high results for some sampling days, but there have been several days when there has been no rain in the last 24 hours and there

have been results well above guidelines. These data show how typically variable water quality data is and why so many samples are required to figure out a pattern.

For streams running through farmland, Tukurua is fairly typical. However, given that the swimming hole is used by many people during the peak summer and the number of results above guidelines, it suggests that we should further investigate the source of this contamination. I am yet to do a walk up the creek but my colleagues in compliance did this time last year and did not find an obvious source.

At this stage we, in agreement with Nelson-Marlborough Public Health, are recommending that the sign advising of the health risk from swimming in the creek remain until further notice. Further sampling and a sanitary survey at the peak occupation around Christmas to mid January will hopefully find a source and improve water quality in this waterway.

Water quality at Tukurua Beach near full tide was well within guidelines for all except one sample last season. We will be sampling the beach again next season.



**Figure 3: Bathing water quality (*E.coli*) results for Tukurua Stream sampled in 2010-11 plotted against rainfall. The alert level indicated by the horizontal red line.**

### 2.5 Review of Bathing Water Quality Monitoring Programme

This bathing water quality monitoring programme will be reviewed using information from the survey of relative use of bathing sites around most of the district (see

separate report), and in conjunction with the Nelson Marlborough Public Health Service On the basis of our existing information the following changes to the programme are proposed:

Cease sampling at the following sites due to very low usage even at peak time:

- Pakawau
- Totara Ave
- Parapara

Increase faecal indicator bacteria sampling to 20 samples/year every year (along with Kaiteriteri, Rabbit Is, Mapua, and Pohara):

- Lee at Reserve
- Roding at Twin Bridges
- Takaka at Paynes Ford lower (#1)

Install temperature probes at the following river hydrology monitoring sites:

- Wairoa at Irvines,
- Motueka at Woodmans,
- Takaka at Kotinga.
- Put Collingwood Boat Ramp in River Water Quality Monitoring Programme

Costs will be managed within the existing budget for the programme.

### **3. CONCLUSIONS**

While results this season showed a moderate to low number of exceedences of the national recreational water quality guidelines compared to previous years, rainfall events accounted for all of these. This is typical throughout New Zealand.

It is hoped that through modelling of water quality in the lower Motueka River and coastal plume, more timely warnings can be directed to the public using the Kaiteriteri beaches in the event of flooding in the Motueka River.

Tukurua Stream continues to be affected by faecal contamination and more work is required to find the source. In the meantime signs will remain at the campground warning people of the health risk.

A review of sites and frequency of sampling used in this monitoring programme will be carried out prior to next bathing season.

#### **4. RECOMMENDATIONS**

**It is recommended that the Committee notes the contents of the report**

Trevor James  
**Resource Scientist**