

# Recreational Water Quality

Swimming water quality is monitored at popular recreational river, lake and coastal bathing sites throughout Canterbury during summer. This allows us to assess microbial water quality and provide the public and authorities with information on human health risks. Water samples are collected weekly from around 100 sites from mid-November to the beginning of March.

## What are we looking for in samples?

We look for the number of faecal indicator bacteria in the water samples we collect. These bacteria occur naturally in the gut of warm-blooded animals, such as humans, birds, dogs, sheep and cows. Indicator bacteria themselves do not pose a significant risk to human health, however their presence indicates the likely presence of pathogens.

Pathogens are microscopic organisms that can cause diseases in humans and animals, such as Campylobacter, Salmonella, Giardia, Cryptosporidium and viruses. These can cause diarrhoea and vomiting or cold and flu-like symptoms.

Different faecal indicator bacteria are used for marine and freshwater sites. Escherichia coli (E. coli) are the indicator bacteria used for freshwaters, whereas Enterococci are used for marine waters.

## Swimming water quality grades

Each bathing site is given an overall suitability for recreation grade (SFRG) at the start of each summer. These grades do not change over the swimming season and should be used to determine whether a particular site is suitable for swimming. Weekly water quality data alone are less reliable for determining the human health risks of swimming at a site, as faecal contamination levels can vary widely from day-to-day.

Sites graded as:

- very good, good and fair are considered suitable for contact recreation, however there may be exceptions during certain times (e.g. after heavy rainfall).
- poor and very poor are generally considered unsuitable for contact recreation. There is typically public notification of this via permanent signage at sites and through the media.

We recommend you avoid swimming during or shortly after rainfall as urban and agricultural run-off may affect water quality. Even spots with the highest water quality can be unsuitable for swimming from time to time when they get contaminated.

Some sites that we monitored in the past are no longer sampled as they were consistently graded as either very good or very poor. We have placed permanent signs at sites consistently graded as very poor to warn people of the ongoing potential health risks of swimming there.



**Please note our swimming water quality grades do not consider risks from the presence of potentially toxic cyanobacteria. Warnings about cyanobacteria override the usual water quality grades for swimming.**

Susceptibility to faecal influence		Microbiological Assessment Category (MAC) (95 percentile of 5 years data)			
		A	B	C	D
Freshwater		≤ 130 <i>E. coli</i> /100 mL	131-260 <i>E. coli</i> /100 mL	261-550 <i>E. coli</i> /100 mL	>550 <i>E. coli</i> /100 mL
Marine		≤ 40 Enterococci/100mL	40 - 200 Enterococci/100mL	201 - 500 Enterococci/100mL	>500 Enterococci/100 mL
Sanitary Inspection Category (SIC)	Very low	Very good	Very good	Follow-up*	Follow-up*
	Low	Very good	Good	Fair	Follow-up*
	Moderate	Follow-up*	Good	Fair	Poor
	High	Follow-up*	Follow-up*	Poor	Very poor
	Very high	Follow-up*	Follow-up*	Follow-up*	Very poor

Table 1. Information used to determine SFRGs.  
Source: Ministry for the Environment/Ministry of Health

Different actions are taken depending on the levels of faecal indicator bacteria found. These actions are summarised in Table 2.

## How a site is graded

Grades are based on national guidelines established by the Ministry for the Environment and the Ministry of Health. They are determined using Table 1 and are based on two types of information:

- Potential sources of faecal contamination that pose a risk to the nearby swimming site, including sewage outfalls, stormwater drains, stock access, water-fowl and run-off from land (Sanitary Inspection Category or SIC).
- Weekly water quality data collected at a site over the previous three to five summers (Microbiological Assessment Category or MAC).

Threshold for sea water	Threshold for freshwater	What to do
less than 140 enterococci/100 ml	less than 260 E. coli/100 ml	Surveillance mode: routine sampling
greater than 140 enterococci/100 ml	greater than 260 E. coli/100 ml	Alert mode: increase sampling and look for sources of contamination
greater than 280 enterococci/100 ml	greater than 550 E. coli/100 ml	Action mode: increase sampling, look for sources of contamination and erect warning signs and inform the public; district and city councils and Community and Public Health are responsible for signage and informing the public of the health risks.

Table 2. Actions taken based on faecal indicator bacteria levels. Source: Ministry for the Environment/Ministry of Health.

## Weekly results

Weekly results of faecal indicator bacteria concentrations are generally updated on our map within 36 to 48 hours of sampling.

Weekly results are used for:

- assessing short-term variation in microbiological concentrations (i.e. week-to-week)
- annually calculating SFRGs (ideally based on five years of data)
- assessing any immediate health risks, including when water quality becomes unsuitable for swimming.

## Health risks of swimming in contaminated water

We are at risk of getting sick from swimming in contaminated water by ingesting pathogens through the mouth, nasal passages and ears. Microbial pathogens, such as Salmonellosis, Giardia and Campylobacter, may cause gastrointestinal illnesses. These can cause diarrhoea and vomiting, along with other 'tummy bug' symptoms, or respiratory-related issues such as cold and flu-like symptoms. Skin, eye and ear infections can also be caught through contact with contaminated waters.

Microbiological water quality guidelines set by the Ministry for the Environment and Ministry of Health set the maximum acceptable level of risk for marine waters at 19 in every 1000 bathers contracting an illness. For freshwater, the acceptable level of risk has been set at 8 in every 1000 bathers.

It is not possible to say there is zero risk to public health in any case. Scientists measure indicator bacteria rather than individual pathogens, and nearby sources of human and animal faeces always pose a risk of contamination. This means that even if beaches, lakes and rivers meet the microbial guidelines, there may still be a small health risk when you swim.

## Sources of contamination

Pathogens derived from human and animal faeces can survive for a considerable time in freshwater and marine environments.

Some of the more common sources of faecal contamination include:

- treated or untreated sewage – broken or leaky pipes, overflows, leaking septic tanks, and boats discharging sewage directly into the sea
- stormwater runoff – faeces from domestic animals can collect on footpaths, gutters and lawns
- rural run-off – this depends on a number of factors including the distance to the nearest stream, rainfall intensity and stock numbers
- stock access – excrement may be deposited directly into the water
- birds – excrement may be deposited directly into the water.

**If you notice any pollution, please contact our pollution hotline on (03) 366 4663 or 0800 765 588. The hotline is managed 24-7.**

## Roles and responsibilities of different agencies

Monitoring of recreational water quality involves the cooperation of multiple agencies including regional, district and city councils, and public health agencies.

Environment Canterbury:

- implements monitoring programmes
- investigates sources of contamination
- informs Community and Public Health and the local district or city council of results
- annually reports and grades sites.

Community and Public Health (medical officer):

- reviews monitoring and reporting effectiveness

- informs territorial authorities
- ensures that territorial authorities inform the public of any health risks.

District and city councils:

- inform the public of high health risks
- identify sources of contamination
- can take steps to abate or remove sources of contamination.

