

# Screening quantitative microbial risk assessment (QMRA): Hihi wastewater treatment plant – lay summary

## How did this study come about?

The Hihi wastewater treatment plant (WWTP) services the community of Hihi. The resource consent for discharge of wastewater expires on 31 October 2022. The Far North District Council (FNDC) is preparing an application to renew the consent, which will be lodged by 31 July 2022. FNDC require a technical assessment which reports on the likely risk of the discharge to public health.

## What is a quantitative microbial risk assessment (QMRA)?

Wastewater can contain 'bugs' that can make people sick if they swallow them or eat food containing them. The most common harmful bugs in human waste are viruses. Viruses can cause many human illnesses, such as the common cold. Viruses in wastewater usually cause stomach upsets, such as vomiting and diarrhoea. However, as the wastewater passes down a river system, you are less likely to find viruses, as the wastewater becomes more and more mixed with the river and sea water (dilution). Also, the viruses may start to die.

A quantitative microbial risk assessment (QMRA) is a computer model of a real-life situation. It estimates how many viruses will be in the river and sea water when it reaches places where people swim or collect kai. The model also includes information on how many viruses it takes to make someone sick.

The QMRA takes a cautious approach. If we don't know the true situation we assume it is worse, not better. Because of this, most of the time, the risk of getting sick will be less than estimated by the QMRA.

## What did this QMRA look at?

This QMRA looks at the risk of people getting sick from the discharge of wastewater from the Hihi WWTP into the Hihi Stream and Doubtless Bay. The waterways will also be polluted by other human activities, but the QMRA only looks at the Hihi WWTP discharge.

The Hihi WWTP will remove viruses from the wastewater. We don't know exactly how many of the illness-causing viruses are removed, but the processes used at the Hihi WWTP are likely to remove at least 99% and may remove more than 99.9% of these viruses.

As this is a screening QMRA only one virus (norovirus) was looked at and only risks from water swallowed during swimming and consumption of raw shellfish from the affected area were estimated.

## What was found?

National standards have been set for rivers and beaches used for swimming. The standards are based on how likely people are to get sick from bugs when they go for a swim. If the Hihi WWTP removed 99% of the viruses the risk of getting sick at most of the identified locations would be so low that the location would be classed as excellent for swimming under the national standards. If the virus removal is 99.9%, which is likely, all locations would be considered excellent for swimming.

Risks from consumption of raw shellfish harvested from the affected area are greater than those for swimming at the same locations. However, if 99.9% of the viruses are removed by the Hihi WWTP, the risks of getting sick would be low (<1% or 1 in a 100) under most circumstances.