

INVESTING FOR SAFE AND HEALTHY WATER IN METROPOLITAN WELLINGTON

UV treatment upgrade at Waterloo Water Treatment Plant



Our water, our future.

Improved protection for vital water resource

Rapid response to change in water supply conditions

Urban Wellingtonians depend on water from the Waiwhetu Aquifer, which is treated at Waterloo Water Treatment Plant.

They need to know the water that comes from their tap is healthy and safe to drink, all the time.

New Zealand's Drinking Water Standards set out water treatment requirements based on the risks to public health from a water source.

Late last year, a change in water we take from the aquifer changed our treatment requirements.

Working together, the Greater Wellington Regional Council, Hutt City Council, Regional Public Health and Wellington

Water agreed to fast-track the introduction of UV water treatment at Waterloo Treatment Plant, to meet these standards and continue delivering safe water.

These recommendations were endorsed by our regional and city councils in August 2017.

We also recommended continuing chlorination of the drinking network. This is because UV treats the water at source, and chlorine ensures water in the network remains safe.

This was a rapid response to an unprecedented change in conditions, and the right thing to do to ensure public health and safety.



Built in 1981, the Waterloo Water Treatment Plant is directly adjacent to Waterloo Station.

Chlorine disinfects water from bacteria, and UV treats against protozoa.

Residual chlorine in public pipes is an added benefit. It ensures that water is safe to drink, all the way to the customer's tap.

ON AVERAGE WE PROVIDE
135 MILLION LITRES OF WATER A DAY

Or about a Westpac Stadium full every 9 days. But in summer, this can rise to 180 million litres a day or more.



Getting the right treatment for safe water

New pipeline to cross Hutt City in time for summer demand

To be effective, UV treatment requires water that is as clear as possible.

As part of normal operations, well pumps start and stop several times a day. This can stir up some very fine particles in the area near the pump intake.

To be safe, the best thing to do is divert this water away from the UV

treatment unit until the particles have cleared. That way we're sure to treat any possible protozoa.

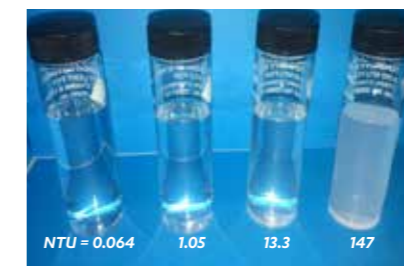
Because of the volume of water, we can't simply divert it into existing stormwater channels. The safest place to divert it to is the Hutt River.

Under normal conditions the water returned to the Hutt River in this way

will be cleaner and at least as clear as the river water. Occasionally, a well that has been idle for some time may produce water at up to 200 NTU for a minute or two, but this would be diluted by water from other wells before entering the river.



Turbidity in the Hutt River is affected by rainfall. Non-flood levels are between 1 and 5 NTU; following heavy rain, the water is highly turbid.



In order for ultraviolet treatment to work, water has to be clear of particles which could potentially be shielding harmful organisms. Turbidity refers to the ability of light to pass through a fluid without scattering. It is caused by particles that



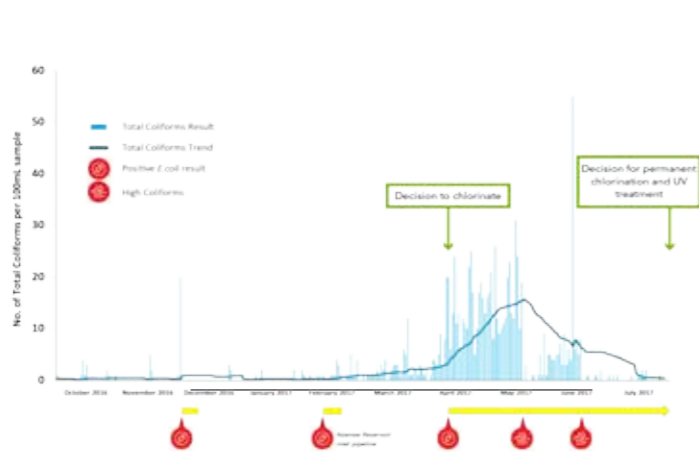
are generally invisible to the naked eye - similar to smoke in air. Turbidity is measured in NTU (nephelometric turbidity units). **For UV treatment to be effective, raw water must be below 1 NTU.**

Our water, our future.

Safe and healthy water is our number one priority

High bacteria levels coincide with E.coli detection in water

Water can carry bacteria, protozoa and viruses that are harmful to human health. We use E. coli counts as an indicator of water contamination. Chlorination is an effective barrier against bacteria and viruses, but not against protozoa. UV treatment is effective against protozoa, making the organism unable to reproduce. At high enough levels UV can also be effective against all harmful bacteria. This is the case at the public taps in Dowse Square and Buick Street, where the water flows are relatively low.



For decades, the Waiwhetu Aquifer has provided water to the Wellington region.

Since late last year, something began to change.

Bacteria levels increased, with no obvious cause. This means we now have to treat this water differently.

Full time chlorination of all aquifer-sourced water at Waterloo Water Treatment Plant began in April 2017.



Bacterial diseases include Campylobacter and E. coli infections.

Campylobacter in the water was the cause of the outbreak of illness that affected one third of the population and was linked to three deaths in Havelock North in 2016.

Working with the community to provide safe water and protect the environment

Fast track project protecting community health and safety

The pipeline from Waterloo Treatment Plant to the Hutt River is over 1.5km long.

It travels down Knights Road, up Cornwall Street and through the CBD to the Hutt River near the Riverbank car park.

We're conscious of the disruption this will cause. We've already spoken to Knights Road residents, and are planning to meet retailers.

We'll make sure there is minimal disruption in the CBD in the lead-up to Christmas, and we're working closely with Hutt City Council on our plans.

We've worked with our contractors, and they're ready to do what it takes to get the pipeline finished by January 2018.

In order to ensure we can meet summer water demand, we're keen to get this pipe built as soon as possible.



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Why we need a new pipeline

First UV unit live in October, second ready by December

Effective UV treatment is a matter of having the right exposure to light to treat the required flow.

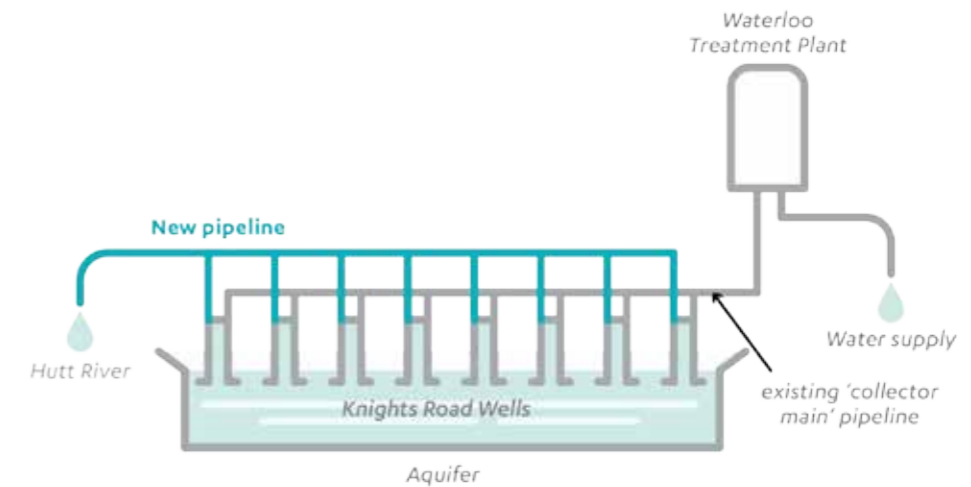
Our UV equipment at Waterloo comes in two units. The first unit has already been installed. It can supply about 60 million litres a day (MLD) of treated water, half of the treatment plant's capacity. The

second unit will be ready in January, in time for peak summer demand.

With 100+ MLD from Waterloo, and up to 80 MLD available from our treatment plant at Te Marua (Upper Hutt) we should be able to meet summer demand.

Until the second UV unit begins operating,

water that is unsuitable for treatment can be diverted using existing treatment plant facilities. But with two units working, we won't be able to cope with the volume. So that unsuitable water will be diverted at the wellhead, through the new pipeline, to the Hutt River.



Some questions and answers

How much will it cost?

The total investment in ensuring we continue to provide safe water for metropolitan Wellington is about \$11 million. This is funded by the water levy paid by the four city councils to the regional council.

How long will the work take?

We're aiming to have the work completed by January 2018, in time for summer demand.

What are the environmental impacts?

Untreated aquifer water will be diverted into the Hutt River through a new outflow and via an existing channel. It could be integrated into a wetland that is being planned as part of Hutt City Council's riverside development.

What consultation has been carried out?

We've worked with council authorities to keep them informed and ensure we're meeting their expectations. We're also in regular contact with residents and others affected by the work.

What will happen to diverted water before the pipeline is finished?

With one UV unit working, we're able to manage the unsuitable water, by storing it briefly before letting it out gradually into existing stormwater channels.

What's the risk of not doing the work?

If we don't carry out the UV installation and associated pipework, we won't be able to assure the region of safe water.

Timeline, milestones and community engagement

