

Auckland Water Supply Fluoridation



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1. Background

Fluoride has been added to Auckland's drinking water for dental hygiene purposes, since the 1960s following the resolution of the Auckland Regional Authority to introduce fluoridation. This was after it assumed responsibility for Auckland's bulk water supply.

This policy was reviewed in 1984 and included consultation with local body customers and no change was made at this time. Fluoridation of Auckland's water supply continued following the formation of Watercare, as directed by the legacy Auckland Councils through a supply contract for bulk water services.

Watercare has progressed significant improvements to all of Auckland's water supply system since the Auckland Councils amalgamated in 2010. The Water Treatment Plant (WTP) fluoridation systems have not been changed during this time, with the exception of planned preventative maintenance and routine equipment replacement activities.

2. Auckland's Water Supply System

Drinking water is supplied to metropolitan Auckland from five major WTPs located in Huia, Waitakere, Onehunga, Ardmore and Tuakau. Water from these facilities is conveyed throughout Auckland via a contiguous transmission network of pipes ensuring that security of supply standards (flow and pressure levels) can be met. Typically, there are no discrete zones/areas that each plant supplies and water is directed in the most cost effective manner to where it is required. Given this system configuration, it is not viable to isolate individual areas within the metropolitan water supply system without compromising the security of supply to that area.

The Onehunga WTP supplies drinking water to the former Onehunga Borough area (Onehunga Zone) and the rest of Auckland's metropolitan water supply system. The Onehunga Zone receives water from the Onehunga WTP that has not had additional fluoride added. In the event of an Onehunga WTP shutdown, the Onehunga zone will receive fluoridated water from the wider water supply network to ensure security of supply to our customers. Automated control valves direct drinking water to either:

- The Onehunga No. 2 Watermain which supplies the Onehunga Zone via the Onehunga Low Reservoir.
- Or the Onehunga No. 5 Watermain which connects to the Hunua No. 3 supplying the wider Auckland Metropolitan area. Water from the Onehunga WTP supplied outside of the Onehunga Zone is fluoridated.

Water supplied to the Little Huia community from the Huia Village WTP is not fluoridated.

Watercare assumed control of 15 non-metropolitan WTPs on 1 November 2010. All Franklin Region WTPs were:

- Ungraded.
- Typically experienced significant source water quality issues for example the Clarks Beach raw water source contained high levels of Boron, the Bombay raw water source contains elevated nitrate levels.

- Consistently non-compliant with Drinking Water Standards for New Zealand 2005 (Revised 2008) (DWSNZ).
- Utilised quantity constrained raw water sources.

To ensure that the Pukekohe community is consistently supplied with drinking water that complies with DWSNZ, the Waikato pipeline was extended to Pukekohe in 2013. To provide this level of service to customers in the Patumahoe, Clarks Beach, Waiau Beach and Glenbrook Beach townships, these communities were connected to the Waikato Pipeline in 2014.

The Cornwall Road, Waiuku Road and Victoria Avenue (all of which service the Waiuku Township) and Bombay WTPs have been progressively upgraded and continue to supply unfluoridated water to their respective communities.

The Wellsford, Warkworth, Snells/Algies, Helensville, and Muriwai Water Treatment Plants did not supply fluoridated water to their respective supply areas prior to 2010. This has not changed since Watercare assumed control of these systems.

3. Chemical Supply

The chemical used to provide fluoride in Auckland's drinking water is Hydrofluorosilicic Acid (HFA). Watercare requires its suppliers to maintain quality control measures to ensure that the supplied chemicals meet New Zealand Water Industry Chemical Supply standards.

The costs associated with the addition of fluoride are between \$200,000 and \$300,000 per annum. Costs can vary based on chemical supply market variations and operational maintenance requirements.

4. Fluoride Dosing Control

DWSNZ states that "For oral health reasons, the Ministry of Health recommends that the fluoride content for drinking-water in New Zealand be in the range of 0.7 – 1.0 mg/L." The Maximum Acceptable Value (MAV) for fluoride is 1.5 mg/L. Watercare operates its dosing systems to achieve a treated water concentration of 0.7 mg/L.

The amount of fluoride added is determined at each WTP and accounts for the naturally occurring level of fluoride in the source water. For example, water abstracted from the Waikato River has a naturally occurring fluoride concentration of between 0.1 and 0.2 mg/L. The installed fluoride dosing system operates to supplement the naturally occurring levels to the target level of 0.7 mg/L.

Fluoride is dosed in proportion to WTP output flows. Dosing systems have been designed to ensure reliable and consistent fluoride dosing. All installed equipment and instrumentation is maintained to manufacturer specifications ensuring accuracy of dosing and analysis.

Online fluoride monitoring is supported by a physical water quality sampling programme. Treated water samples are collected at each WTP for fluoride analysis.

System alarms based on online analyser output, have been established in the WTP

control systems to ensure compliance with DWSNZ. Continuous monitoring alarms are set as follows:

- Hi limit = 1.0 mg/L
- Lo limit = 0.5 mg/L

Fluoride dosing systems are shutdown when fluoride monitoring alarms are raised to prevent dosing outside of the control limits. Following system shutdown, operations staff investigate the cause of the alarm and address any issues.

In the unlikely event of elevated fluoride levels being detected in the treated water, Watercare has the ability to isolate the affected process stream.

i. Appendix 1: Updated “Water Fluoridation FAQs” Document

Water fluoridation FAQs

Why is fluoride added to Auckland’s water supplies?

Fluoride is added to drinking water for oral health reasons (i.e. prevention of tooth decay), as per guidelines set by the Ministry of Health. Fluoride occurs naturally in groundwater supplies and is also present in a large number of food and beverage products.

Some Aucklanders receive fluoridated water and some don’t - who makes this decision?

Fluoride is added to Auckland’s treated water supplies at the request of Auckland’s legacy councils (prior to Auckland Council integration). Historically, councils in the greater Auckland region have held their own public referenda on water fluoridation, where some communities have voted to add fluoride into their water and others have voted not to. Currently, Onehunga is the only Auckland metropolitan area where fluoride is not added.

At which Auckland water treatment plants is fluoride added to water?

The table on the right outlines which Auckland water treatment plants add fluoride to treated water and which do not.

How is the quantity of fluoride in Auckland’s drinking water controlled?

Fluoride is added to Auckland’s drinking water to achieve a concentration of 0.7 mg/L. The Ministry recommends that the fluoride content for drinking water in New Zealand be in the range of 0.7–1.0 mg/L. The maximum acceptable value (MAV) of fluoride in drinking water is 1.5 mg/L. Fluoride levels are closely monitored to ensure that these requirements are met.

Fluoride is added to drinking water by way of Hydrofluorosilicic acid. The chemical is purchased from reputable suppliers who have quality control measures in place to ensure that the supplied chemicals meet required quality standards.

The control measures used include:

- Fluoride is delivered at a specified concentration so there is no risk of dosing a more concentrated solution
- Treatment plants utilise continuous on-line instruments to monitor fluoride levels in the treated water
- Samples are also collected for laboratory analysis to supplement our on-line monitoring
- Alarms are triggered if the fluoride concentration deviates from the control limits

Watercare Water Treatment Plants		Fluoride Added?
Metropolitan (x5)	Ardmore	yes
	Huia	yes
	Onehunga ¹	no
	Waitakere	yes
	Waikato	yes
Non-Metropolitan (x10)	Wellsford	no
	Warkworth	no
	Snells/Algies	no
	Helensville	no
	Muriwai	no
	Huia Village	no
	Bombay	no
	Cornwall Road (Waiuku)	no
	Waiuku Road (Waiuku)	no
	Victoria Avenue (Waiuku)	no

¹ The Onehunga WTP supplies unfluoridated water to the Onehunga Zone. It has the ability to supply fluoridated water to the wider Auckland system.

I still have concerns - where can I find further information on water fluoridation?

The Ministry of Health has provided helpful answers to a range of frequently asked questions on water fluoridation on its website at the following location:

<http://www.health.govt.nz/our-work/preventative-health-wellness/fluoridation>

The National Fluoride Information Service (NFIS) is a consortium funded by the Ministry of Health. Further information on the NFIS is available on the Regional Public Health website in the NFIS section:

<http://www.rph.org.nz>