

Introduction

On 8th August 2019, Jim Graham, Principal Advisor Water Quality with Water New Zealand made a presentation to Council about his recent study trip to the Netherlands and Denmark to look at chlorine free drinking water supplies. Jim met with a number of water suppliers to understand how they manage and operate their water supplies in a way that provides safe water without using chlorine. Jim told council that he was convinced that it was possible to provide chlorine free water with a minimum of risk to public health, but it would require adoption of the approach used in Denmark. This was because all water supplies in Denmark use ground water and none of them have ever used chlorine and as a result, the Danes have developed a successful approach over more than 100 years and have worked out by trial and error, what works and what doesn't. Jim suggested that the Danish approach provides a good model that New Zealand supplies could follow but he provided a caution to Council that because the Danish approach was very different to the approach that had been used for chlorine free supplies in New Zealand, major upgrading and changes to the way we do things would be required if we were to follow the Danish example. He suggested that the cost would be high and the time to make the necessary changes would be at least 20 years. Below is a summary of the key points from Jim's presentation.

Summary of key points from the presentation to Hastings District to Council by Jim Graham on 8th August 2019.

Chlorine free drinking water supplies in the Netherlands and Denmark

- The Netherlands does not provide a good model for NZ to follow because the main supplies use surface water and utilise extensive treatment systems, whereas unchlorinated drinking water supplies in New Zealand use groundwater.
- In Denmark all drinking water supplies use ground water and chlorine has never been used. The Danish approach provides a good model for New Zealand water supplies.

The Danish approach

- 2000 water supplies provide water to 98% of the population of 5.7m
- All costs of water supply are paid by consumers
- In 2010 a law was passed which stopped local councils from being water suppliers. Water supplies are required to have corporate structures with boards. The councils have representation on the boards.
- Every water connection is metered, and water users pay a volumetric charge. For domestic supplies this is equal to about NZ\$3m³
- A comprehensive research programme supports all of the drinking water activities in Denmark. Research is a collaboration between the Universities, water suppliers and the water regulator. The research is funded through water charges.
- The ground water aquifers are fully mapped and modelled with the water balance within the aquifers monitored in relation to surface water and sea water effects.
- The balance between recharge and abstraction and aquifer vulnerability is closely monitored.
- Any land use activities are scrutinised in terms of their effect on the groundwater resources.
- The cost of monitoring and managing the aquifer is equivalent to NZ\$ 345m annually. Water consumers pay for this in their charges.
- Source water risks are comprehensively assessed and managed.

- Bore water levels are continuously monitored to assess discharge and recharge effects on the aquifer.
- There is meticulous management of storage in distribution systems with increasing use of stainless steel for tanks and tanks being located inside protective buildings.
- Water networks are continuously monitored for flow and pressure across their entirety.
- Network dead ends have been removed in a process called looping.
- All connections are metered and people pay for the amount they use.
- Increasingly smart meters have been installed and networks are arranged into small zones. The volume of water going into a zone is measured and compared to the cumulative total of water used at each meter in a mass balance calculation. This gives the water supplier an indication of how much water is lost from the network and when breaks occur.
- Every connection has a backflow device and any connection other than a household has a testable backflow device. Testable devices are tested at least annually but many 2 or 3 times a year.
- The biggest difference between NZ and Denmark was the attitude and approach of the public and people in the water industry. Water was highly valued and very high standards of care were non-negotiable