

Understanding Martinborough Water Supply

Mark Allingham, Infrastructure and Services Manager, SWDC (written for the March issue of the Martinborough Star)

During the Martinborough Boil water notice it came to our attention that many in the township were unaware of how the Martinborough water supply operated and why the system is not currently chlorinated.

Martinborough's system (Image 1) is different to most water systems in that groundwater is extracted from the bores next to the Rumahunga river to the west of town. It is then treated with Ultra Violet Radiation (sun lamps), PH corrected and pumped through the township to the reservoir tanks on the hill above the golf course. The gravity pressure from the tanks and the bore pumps keeps the pressure in the pipes that supply your homes.

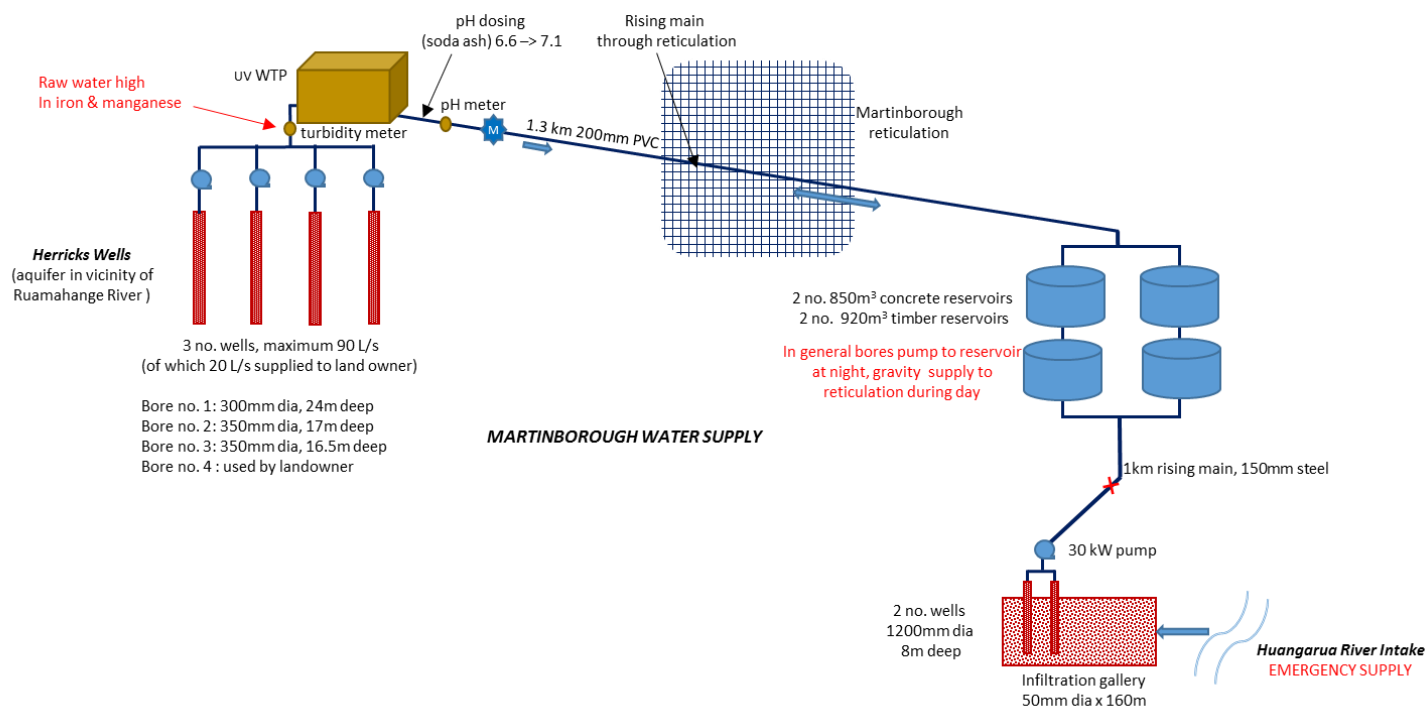


Image 1 – Martinborough Water Supply (uv WTP = UV water treatment plant)

Quarterly testing of the untreated groundwater, since 1990, has not shown any indication of bacterial contamination. The last of these routine tests was carried out in December 2018.

The UV disinfection system (Image 2) provides treats the water after it is extracted from the bores and at the point enters the system. The system relies on the premise that nothing else enters the system from anywhere. Backflow prevention mechanisms are fitted on connections throughout the system with the aim of preventing potential sources of contamination.

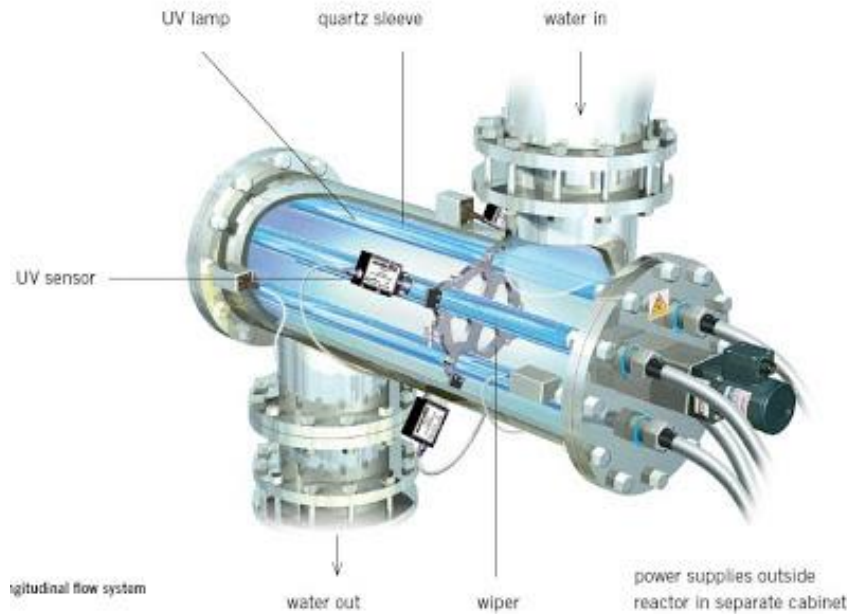


Image 2 – Diagram of UV disinfection system

The next three points are critical to understanding why there are issues associated with chlorinating Martinborough’s water:

1. Inside the pipes is a biofilm (Image 3) that naturally accumulates on the pipe walls (like cholesterol in arteries).
2. The groundwater from the bores contains manganese, this when mixed with chlorine will discolour the water and while completely safe to drink, being blackish in colour is not palatable.
3. As the water is pumped through town to the tanks, the manganese settles on the bottom of the pipes, in the biofilm, and is suspended in the water.



Image 3 – Biofilm inside a pipe

So, if there is a broken pipe or major disturbance to the pipes this can cause either the dark manganese granules or biofilm containing the manganese to be released, this can enter people’s water supply. Manganese is more of an issue in areas of the system where it settles in the biofilm, for example the bottom end of the system (New York St) and where the water travels frequently

backwards and forwards between the tanks and the bores; it's not so much of an issue at the top end of town.

Martinborough water is not chlorinated due to the presence of manganese. A manganese removal plant is planned for the future to enable chlorination. The additional of residual chlorine in the water protects it as it moves through the pipes and ensures the water is safe should anything enter the system. It will also destabilise the biofilm for a period of time.

Questions often asked are...

Q Why do people have discoloured water at times, is it chlorine?

A. It is not due to chlorination but rather a disturbance unsettling in in parts of the system where in is heavier.

Q. Is it true that Martinborough water can't be chlorinated?

A. The system can be chlorinated, but must have the manganese reduced/removed to prevent discolouration.

Q When Martinborough Estate (East of Todds Rd) was chlorinated during the boil water notice period, the water didn't change, why?

A. The pipes are all newer than the older parts of town so there is very little biofilm and at the top end of the system there is also very little manganese.

Q. When flushing the top end of the system (East of Todds Rd), why did some houses have discoloured water at the bottom of the system?

A. Unrelated to the flushing, we unfortunately had a broken water pipe off the main at New York St West at the same time. This is what caused the discoloured water.

Q. If you replace water pipes why is the manganese and biofilm and issues?

A. We replace pipes on wear and criticality in sections over the whole network so no one area is new at any one time. For example the Main at New York Street West was replaced but the lateral coming off the main broke, this caused the discoloured water in this area.

Q. Why don't the other towns have these issues?

A. Featherston and Greytown supply does not have Manganese and is chlorinated.

Any comments or questions, please contact Martinboroughwater@swdc.govt.nz