

Community Drinking Water Supply Information

Who looks after your water?

Three organizations are concerned with the provision of safe and wholesome drinking-water to any particular community in New Zealand, one at the local level, one regional and one with a national perspective.

At the local level, a typical supply is owned by a territorial local authority, such as a district or city council. They extract the source water, run the treatment plant to remove risks or contaminants and pipe the water to your door. Under the Drinking – Water Standards for New Zealand 2000, they are expected to test the water regularly to demonstrate that it is safe.

What are the components of a water supply system?

The simplest water supply is just a well with a pipe from it, or a pipe from a river or lake, perhaps with a pump and storage tank. More commonly though, as a population increases, a treatment plant is required to remove actual or potential contaminants and ensure the water delivered is safe to drink. The most common treatment is chlorination, where a chemical compound is mixed with the water to kill any bacteria from the source. This treatment will also maintain some degree of residual “resistance” to any subsequent bacterial entry to the water while it is in the pipe work. Other treatment processes include coagulations, filtration and the removal of other contaminants. Removal of cloudiness is important because chlorination is not as effective otherwise.

The water is transported to users through a network of pipes, known as the reticulation or distribution system. In larger cities, some suburbs may be supplied differently from others. Additional pumping may be required to suburbs on the hills, or the city may be subdivided, with one plant supplying to one part but not to another.

Terms formally used in relation to a water supply connection, are as follows:

Community: The people served by the supply.

Zone: That part of the town or community receiving water of similar quality. For a small supply, that means “everywhere”. For larger supplies, it may be only part of a town or city. By definition, parts receiving different water will be in different zones.

Plant: The treatment plant supplying the water. In some situations where no treatment is given, a nominal plant is defined as where the water is pumped from or merely gathered together. In others, the treatment plant will have highly technical operations with extensive automated control and monitoring of water quality.

Source: The river, ground water or other source from which the water is taken.

What is the public health grading?

In order to compare water supplies and identify those that may not be delivering quality water, the Ministry of Health grades each supply. How are supplies graded? First, they are examined to find out how they function, where the water comes from, what is done to it, how often its quality is checked and what the results indicate. There is a strong concern, not only about the quality of the end product, but also about whether adequate barriers to potential contamination are in place in the system. This is important, because even frequent monitoring can miss some pollution events.

For each zone, a two-letter grading is designated, such as Aa, Cb, Ed, etc. The capital letter represents the grade of the water coming into the zone, while the lower-case letter indicates the quality of the water received at your gate. Typically, if one tends to be high (A or B), so will be the other (a or b), but any combination is possible.

As a very rough rule of thumb, for a grade of Bc, the B represents the best potential quality as the water leaves the treatment plant, while the c is the actual quality received by the consumer. This is a gross simplification, but is useful to gain an initial grasp of how the letters relate.

The source and plant grading (A to E)

The source and plant grading relates to the water as it is when leaving the treatment plant, before it enters the reticulations system. It is concerned with the barriers guarding against contamination. Possible grades are:

Grade	Description
A1	Completely satisfactory, negligible level or risk, demonstrably high quality
A	Completely satisfactory, very low level of risk
B	Satisfactory, low level of risk
C	Marginal, moderate level of risk, may be acceptable in some small communities
D	Unsatisfactory, high level of risk
E	Completely unsatisfactory, very high level of risk

Gradings are calculated using a complex algorithm, involving multiple tables. Factors include the water's origin, characteristics, and compliance with standards and the degree of treatment and process supervision. Each grade can be attained by a variety of factor combinations.

The distribution grading (a to e)

Emphasis in this part of the grading is on the quality of the water and the systems in place (procedures and reticulation quality) to minimize the risk of unsafe water to the consumer. The grading is calculated using a questionnaire, with demerit marks awarded for unsatisfactory aspects. Possible grades are:

Grade	Description	Sum of Marks
a	Completely satisfactory, negligible level of risk, demonstrably high quality	0-3
b	Satisfactory, low level of risk	4-7
c	Marginal, moderate level of risk, may be acceptable in some small communities	8-10
d	Unsatisfactory, high level of risk	11-15
e	Completely unsatisfactory, very high level of risk	16-33

Demerit marks are given for a variety of reasons, including (most significant ones first):

- 8 marks Non-compliance for faecal coliform bacteria
- 4 marks Non-compliance for health-significant chemicals
- 5 marks Inadequate supply management
- 3 marks Each of: inadequate pressure, storage, backflow prevention
- 2 marks Each of inadequate piping, maintenance

While the combinations are obviously many, three important conclusions are:

- A zone without bacterial compliance cannot gain an “a” or “b” grade.
- A zone without chemical compliance cannot gain an “a” grade.
- Inadequate management alone can have a significant effect on the grading attained.

Wairoa Community Water Supply Grading:

COMPONENT:	CODE:	NAME:	POPULATION:	GRADE:
COMMUNITY	WAI006	Wairoa	4,650	
		Local Authority: Wairoa District Council		
ZONE:	WAI006FR	Frasertown	350	Ab
Plant:	TP00100	Wairoa		A
Source:	S00063	>>Waiau River, Wairoa		
ZONE:	WAI006WA	Wairoa	4,300	Aa
Plant:	TP00100	Wairoa		A
Source:	S00063	>>Waiau River, Wairoa		