

**Register of
Community
Drinking-Water
Supplies in
New Zealand**
2004 Edition

**Compiled by
the ESR Water Group
for the
Ministry of Health**

This Register lists the information available to the Ministry of Health about community drinking-water supplies in New Zealand.

Community drinking-water supplies are drinking-water supplies serving 25 or more people for at least 60 days a year. This includes many schools, permanent camp sites and marae.

For each supply, the source of water, the plants where water is treated and the distribution zones are listed, together with any provisional public health gradings that have been given and contaminants of public health concern (Priority 2 determinands) known to be present.

The aim of the Register is to provide easily accessible information about community water supplies. If your supply is not listed here, send the name and address of the water supplier to:

Register of Community Drinking-water Supplies in New Zealand,
Ministry of Health, PO Box 5013, Wellington.

The supply will then be included in future editions of the Register.

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FOREWORD

This edition of the *Register of Community Drinking-Water Supplies in New Zealand* supersedes the 2003 (12th) edition printed in June 2003. Like the earlier edition, it includes information on the Ministry of Health's public health grading of community drinking-water supplies and the presence of substances at concentrations that may be of public health significance.

This edition defines 2,013 community drinking-water supplies, a net increase of 49 (representing 77 additions and 28 deletions) over the previous edition. For these supplies, 449 Priority 2 determinands are listed, compared with 451 previously.

The introductory section and *Register* format are designed so that the information presented can be clearly understood by those without technical knowledge of drinking-water management.

Readers should note that the public health gradings listed are provisional because they are based on the *Drinking-Water Standards for New Zealand 1984*, which have been superseded by the *Drinking-Water Standards for New Zealand 2000*. The Ministry of Health finalised a new public health grading process (*Grading 2003*) in September 2003 and this will be used for all grading processes after the publication of this edition of the *Register*.

It is expected that the 2005 edition of the *Register* will contain a mix of provisional and *Grading 2003* gradings, but subsequent editions will display the new gradings only. Supplies with only provisional gradings will from that point onwards be presented as ungraded.

The 2005 edition of the *Register* is also expected to include an assessment for each supply of progress in creating and implementing public health risk management plans.

REGISTER OF COMMUNITY DRINKING-WATER SUPPLIES IN NEW ZEALAND

2004 Edition

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Acknowledgements

The *Register of Community Drinking-Water Supplies in New Zealand* is maintained as part of the Water Information New Zealand (WINZ) database system for drinking-water by the Water Group of ESR, a Crown Research Institute. This work is performed under contract to the Public Health Regulatory Services of the Ministry of Health.

Information for creating and amending individual supply records is gathered by health protection officers of the District Health Boards, with the close co-operation of officers of the territorial local authorities.

Any comments or suggestions regarding the *Register* are welcome and should be addressed to:

The Manager
Public Health Policy and Regulation
Ministry of Health
PO Box 5013
Wellington

or

Barry Mattingley or Alan Ferguson
Water Group
ESR
PO Box 29-181
Christchurch

Quick Reference

Finding a supply

- Supplies in the *Register* are grouped by health district.
- Supplies within a health district are listed in alphabetical order.
- Health districts in New Zealand are listed from north to south.
- There is a **full index of communities at the back** of the Register.
- Or try www.drinkingwater.org.nz to see the latest entry on the web.

Understanding the tables

- Figure 3 on page 13 explains the details of a typical *Register* entry.
- Read the User's Guide section following for a fuller understanding.

The public health grading

The Ministry of Health grading provides an assessment of its confidence in the public health safety of each drinking-water supply serving a community of over 500 people. The grading has two letters. The first letter (in upper case) represents the source and treatment grading, while the second letter (in lower case) grades the water in the distribution zone itself. Gradings containing C or c indicate marginal quality, while lower gradings show that quality or risk management is unsatisfactory.

An ungraded supply is indicated by u in the *Register*.

Source and treatment grading

Assessment based on source and treatment factors:

- A1 Completely satisfactory, negligible level of 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.

Distribution zone grading

Assessment based on reticulation condition, management, and actual water quality:

- a Completely satisfactory, negligible level of risk, demonstrably high quality
- 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.

User's Guide to the Register

To understand the *Register of Community Drinking-Water Supplies in New Zealand*, you need to know something about drinking-water and how it is managed. By reading this guide you will understand more clearly how water supplies are managed in New Zealand, what the main risks from low water quality are, and the basic approaches to overcoming them. You will also learn what a grading is, how it is related not only to the quality of the water you drink, but also to how well the supply is managed to minimise risks to your health on an ongoing basis. By the time you have finished, you should also have some appreciation of the New Zealand Drinking-Water Standards, why all supplies should be tested regularly for bacteria, and why some supplies require regular testing for particular chemicals.

With that understanding, you should find the *Register* entry for your local supply to be brief but informative. If your water supply is good, you can appreciate this public notification of its quality. Otherwise, as a consumer, you can either accept the situation or make it clear locally that good drinking-water is important to you.

Purpose of the Register

The *Register* provides health professionals, drinking-water professionals and the general public with an authoritative summary of the health-risk status of all community drinking-water supplies known to the Ministry of Health. "Community drinking-water supplies" means all drinking-water supplies serving more than 25 people for at least 60 days a year.

For each supply, the *Register* records:

- the name of the community
- the components of the supply, namely sources, treatment plants and distribution zones
- unique codes for each component (to aid clear identification)
- who owns and operates the supply
- how many people use the supply.

If more than 500 people are served, the *Register* also records:

- the public health grading for the supply
- any substances of public health significance in the supply requiring monitoring.

The public health grading is an evaluation of both the actual water quality and the underlying measures taken to minimise risk. Those measures ensure the water remains safe and wholesome now and in the future.

Most supplies listed are publicly owned, but some are private. For example, country motor camps or motels serving 25 people or more are expected to be registered. Registration of smaller supplies is voluntary.

Finding drinking-water supplies in the *Register*

The index at the back of the *Register* lists all the supplies in New Zealand in alphabetical order.

The *Register* is arranged so that:

- supplies in the *Register* are grouped by health district
- supplies within a health district are listed in alphabetical order
- health districts are listed from north to south.

Two examples:

- Community “Aranga Beach” in Northland is on page 1 of Table 1, ie page 1.1.
(Reason: Northland is the most northern health district in New Zealand, and communities beginning with A appear first in a table.)
- Community “Wyndham Primary School” in Southland is on page 20.13.
(Reason: Southland is the most southern health district in New Zealand, so it is in the last or 20th table in the *Register*. Communities beginning with W appear towards the end of a table.)

Finding the latest data on the Web

Users of the *Register* are encouraged to visit the companion website www.drinkingwater.org.nz where the entry for any supply can be viewed and printed on-line. The website is updated weekly from the National WINZ database.

A copy of the printed *Register* can also be down-loaded in Adobe PDF format from the Ministry of Health website at www.moh.govt.nz/water

Who looks after your water?

Three organisations 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 in this *Register* is owned by a territorial local authority (TLA) 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. If you are unhappy with your water supply, your first step should be to contact them.

The drinking-water standards were produced by the Ministry of Health, which has a national function to ensure appropriate regulations are in place. The Ministry of Health does not check on the local authorities directly, but instead works at the regional level through the District Health Boards (DHBs). Each DHB is expected to oversee the TLAs in its area and ensure (audit) that they maintain appropriate water quality. In a serious health risk situation, the DHB can, through the health district's Medical Officer of Health, order a water supply to close, but generally it

works effectively through persuasion rather than coercion. You can discuss health aspects of your drinking-water with your DHB if you have concerns. DHBs also report to the Ministry so that a national picture (such as this *Register*) can be maintained of the state of all community drinking-water supplies.

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 pipework. Other treatment processes include coagulation (making fine particles drop out), 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. For a complex situation like Dunedin City, at least eight areas can be identified as having water different to their neighbouring suburbs.

The different components of a water supply are listed in the *Register*, with lines to indicate how they are connected. The terms used are formally defined in the glossary (page 20). Here is a brief summary:

Community: The people served by the supply.

Zone: (or Distribution 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, groundwater or other source from which the water is taken. About half of New Zealand’s drinking-water is pumped from the ground, with the remainder coming from surface sources.

In the *Register*, each of these components is on a separate line and each component has its own code, which is unique in New Zealand. The lines are ordered so that you can see which plants and sources supply each zone.

What are the major water quality concerns?

Chemical contamination of New Zealand supplies is always a risk, but usually it is a very small one. Most chemicals mentioned in the *Drinking-Water Standards for New Zealand 2000* specify levels likely to cause adverse effects only after prolonged periods of exposure, so, with some exceptions, chemicals are not the main area of concern unless there is a major chemical spillage.

Throughout the world (and New Zealand is no exception) by far the most common problems arise from microbiological contamination of the source waters. Animal, bird and even human effluent, introduced in one way or another upstream from a water supply, can make that water unfit for consumption. Bacteria have always been of major concern, while protozoa such as *Giardia* and *Cryptosporidium* are increasingly being highlighted as causing ill health through drinking-water.

There are two ways of minimising the risk from these microbiological contaminants:

1. Keep the source as clean as possible by protecting the catchment and minimising the possibility of contamination.
2. Treat the water to destroy any contaminants introduced.

The most successful approach is to use both of these methods, and to regularly monitor the water quality to demonstrate that any risks are being controlled. Good systematic and ongoing management is important.

How do they know how much monitoring is necessary?

The amount of monitoring required is specified in the *Drinking-Water Standards for New Zealand 2000*. (Updated standards are expected in late 2004.) The standards speak about “determinands”, which are chemical substances, microbiological organisms, or some other characteristic of the water that can be measured, “something for which you can test”.

The standards divide all determinands of public health significance into four classes according to the priority with which they should be measured. This avoids unnecessary monitoring. Of the four classes, only determinands in the Priority 1 and 2 classes require measuring, but the others have been defined in case they are required in the future.

What are Priority 1 determinands?

The determinands with the highest priority for monitoring, appropriately called “Priority 1 determinands”, must be measured in all drinking-water supplies. These are currently micro-organisms that are of public health significance.

The first of these is bacteria. To gain an indication of water contamination by faecal material, a bacteria called *E. coli* is measured.

Giardia and *Cryptosporidium* are protozoa becoming increasingly of concern in drinking-waters, so these are also Priority 1 determinands. Because direct testing for these protozoa is not

months, and the Ministry of Health is satisfied that the risk is not significant, that Priority 2 entry will be removed from the *Register*.

All Priority 2 determinands listed in this *Register* are chemicals, but micro-organisms or radiological constituents can also be defined.

Why is fluoride a Priority 2?

If you see fluoride beside your supply, it will most likely be because it has been added at the treatment plant to help fight against tooth decay. It is not a contaminant or a health risk at the usual level of application, but since it is a health risk at higher concentrations, it is important that it be regularly monitored. While the Priority 2 general requirement is monthly monitoring, fluoridated supplies must be tested at least weekly.

In some areas of the world, fluoride naturally appears at excessive levels in groundwater. However, this is very rare in New Zealand.

What is an aggressive water?

Some supplies have *aggressive water* included in their list of Priority 2 determinands. This is not a determinand as such, but indicates that the drinking-water supply has a tendency to corrode household metal pipes, taps and other plumbing. If these corrode, small amounts of metals are removed from their surface and either deposited in the pipe (such as rust), or remain dissolved in the water. It is the dissolved metals that are of concern here.

Corrosion is usually a slow process, but *aggressive water* held within your plumbing overnight can end up with high dissolved metal levels. When you then turn on the tap, the first glass of water will contain these metals and should not be drunk or used for food preparation. Instead, flush the tap: run the first two glasses to waste or use it for some other purpose. After that, the tap water should be quite safe to drink.

The supplier of such water is required to publicly notify consumers that they should flush any tap before taking drinking-water if that tap has not been used for several hours or more. It is important that consumers on *aggressive water* supplies know this, which is why it is listed as such in this *Register*.

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. So far, only those with populations over 500 are graded, but those with as few as 25 users will be graded in the future.

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. In all, 33 aspects of the source and treatment are examined, along with 22 factors for the distribution system and final water quality. 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 (ie each area receiving similar water), a two-letter grading is designated, such as Aa, Cb, Ed, etc. The capital letter (A1, A, B, C, D or E) represents the grade of the water coming into the zone (ie source quality and treatment) while the lower-case letter (a, b, c, d or e) 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 (regarding risks of contamination, etc), 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.

In the *Register*, each graded zone has its two-letter grade listed on the same line. Each contributing plant has its "source and treatment" upper case grade alongside it. Where only one plant serves a zone, this grade is the same as the upper case letter in the zone line, so it hardly needs repeating. However, if two or more plants serve a zone, the "worst case" plant grade is the one taken up by the zone. Having it all here lets you see if any plant is associated with more risk than the others.

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 reticulation system. It is concerned with the barriers guarding against contamination. Possible grades are:

Grade	Description
A1	Completely satisfactory, negligible level of 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. However, some generalisations can be made:

- An A1 grade requires not only quality water and procedures, but also that an internationally-recognised quality assurance scheme be in operation.
- An A1 or A grade will always have residual disinfection in place to safeguard against microbiological contamination.
- Deep groundwater that is not chlorinated can at best receive a B grade, because of the slight but real possibility of contamination in the reticulation system.
- Water not meeting the *Drinking-Water Standards for New Zealand 2000* cannot attain an A or B grade, but may receive a C grade.
- A C grade usually implies that the quality of the water delivered is variable and that there is only a low level of confidence that the water will always be safe.
- A D grade may mean the supply is from a protected river or lake catchment, but treatment is inadequate.
- An E grade is likely to mean that the water comes from a river or lake without adequate protection from animal or human contamination, and subsequent treatment, if any, is inadequate to overcome these risks.

In conclusion, water of grade C is considered marginal. It may be acceptable to consumers in very small supplies if the alternatives are too expensive or otherwise impracticable.

Water of grade A or B is considered safe, while a grading of D or E indicates either the water is unsafe or there are inadequate data or procedures in place to demonstrate otherwise. This is an important proviso, since both the grading and standards emphasise that the water must be shown to be safe. Finding nothing wrong because you hardly looked is not acceptable.

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 minimise 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.

As emphasised in the earlier discussion, while chemical risks are important, the primary risk is microbiological.

To conclude, an “a” or “b” grade is satisfactory, a “c” is marginal and “d” or “e” grades are unsatisfactory.

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Figure 1

REGISTERING AND GRADING A SUPPLY

Schematic outline of processes

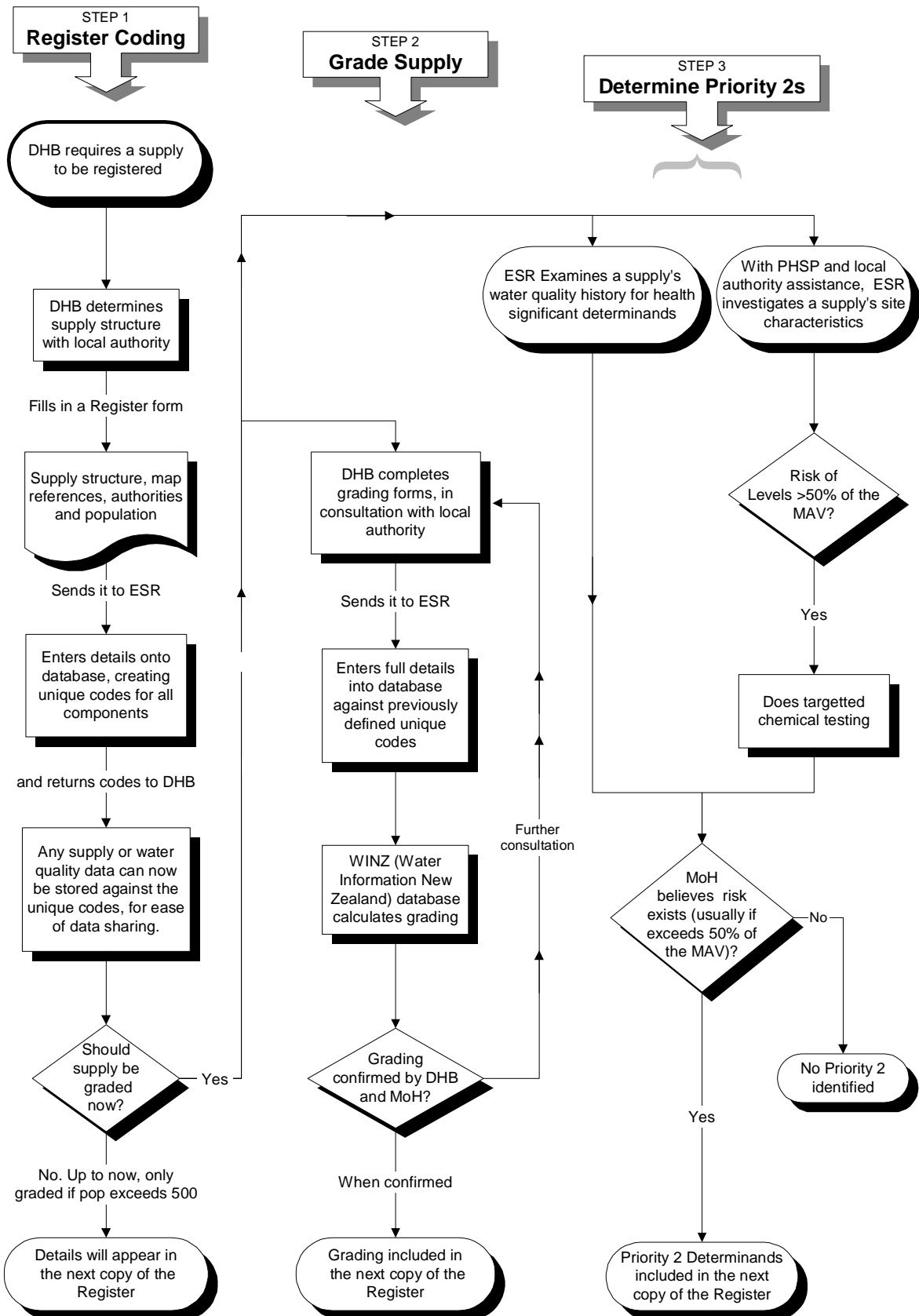
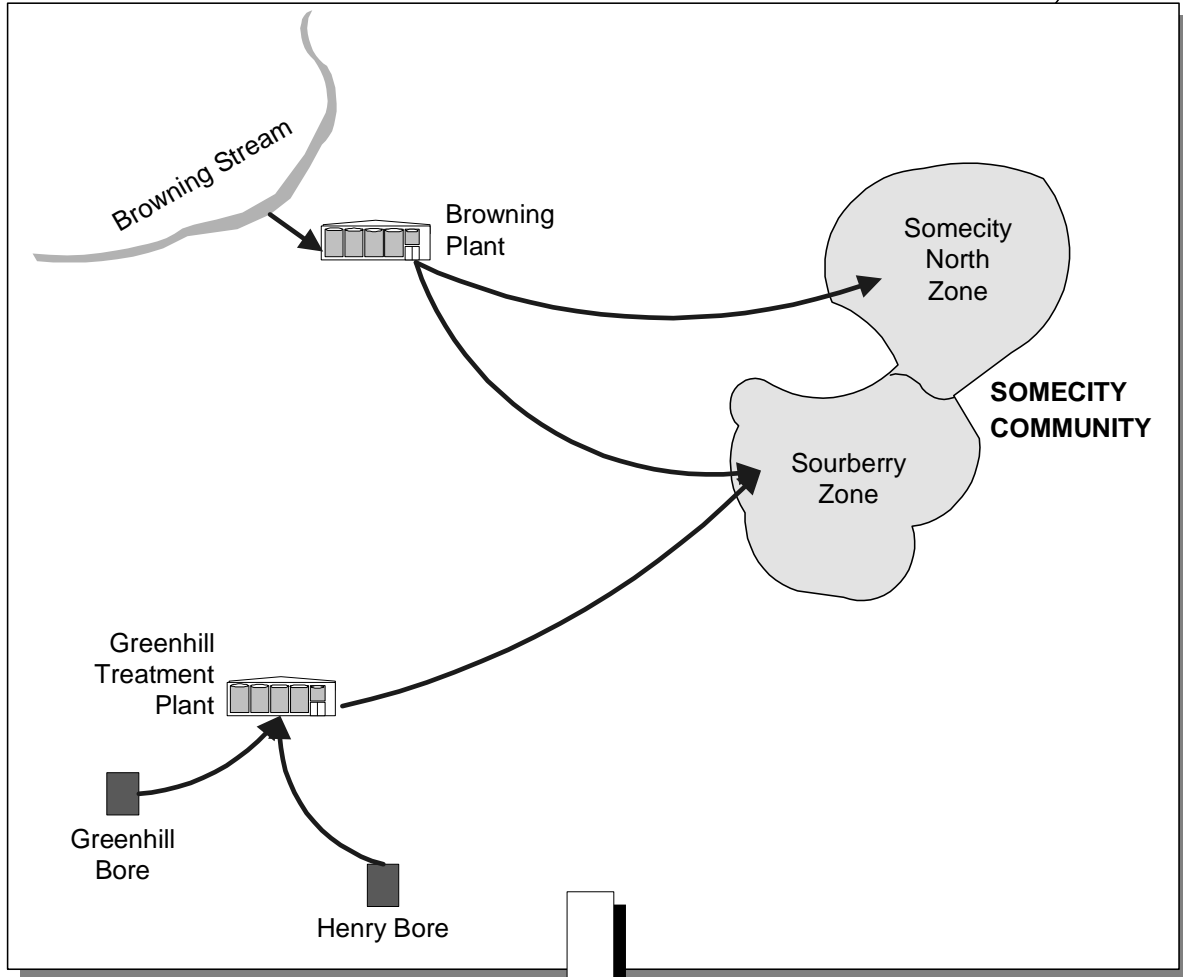


Figure 2

EXAMPLE OF A COMMUNITY

Note: Example is totally fictitious.


Somecity - Physical Situation



Somecity - Register Representation

Register				
Component	Code	Name	Population	Grade
COMMUNITY	SOM001	Somecity Local authority: Somelands District Council	1,220	
-- Zone	SOM001SN	Somecity North	750	Dc
-- Plant:	TP00918	Browning		D
-- Source:	S00651	Browning River		
-- Zone	SOM001GH	Sourberry	470	Dc
-- Plant:	TP00919	Greenhill		B
-- Source:	G00866	> Greenhill Bores		
-- Source:	G00871	> Henry Bore		
-- Plant:	TP00918	Browning		D
-- Source:	S00651	> Browning River		

21.3



Health District 21

West H District

Xland Health

Figure 3 REGISTER EXAMPLE EXPLAINED

Note: Example is totally fictitious.

Register

Component	Code	Name	Population	Grade
COMMUNITY	SOM001	Somecity Local authority: Somelands District Council	1,220	
-- Zone	SOM001SN	Somecity North	750	Dc
-- Plant:	TP00918	Browning		D
-- Source:	S00651	Browning River		
-- Zone	SOM001GH	Sourberry	470	Dc
-- Plant:	TP00919	Test for: Arsenic, Boron		B
-- Source:	G00866	Greenhill		
-- Source:	G00871	> Greenhill Bores		
-- Plant:	TP00918	> Henry Bore		D
-- Source:	S00651	> Browning River		

Map: 21.3 Health District 21, West H District, Xland Health

Callouts:

- The local authority for the relevant district is shown regardless of ownership
- If the Water Authority is not the local authority, an extra line will give details here
- Community names are alphabetical in a Health District. Zones names are alphabetical within communities, etc.
- Population of the distribution zone. These should add to give the community population. A "?" indicates information not supplied yet.
- Gradings are currently shown only if the community population is 500+
- Health Districts are in north to south order. 1 is Northland, 20 is Southland. Name is written sideways
- Blob on map shows approx location
- Priority 2 determinands identified in this particular supply component, because past testing or situation evaluation indicates levels may be of health concern.
- The Source and Treatment Grade can be:
 - A1 Completely satisfactory +
 - A Completely satisfactory
 - B Satisfactory
 - C Marginal
 - D Unsatisfactory
 - E Completely unsatisfactory
 - u ungraded
- The Distribution Grade can be:
 - a Completely satisfactory
 - b Satisfactory
 - c Marginal
 - d Unsatisfactory
 - e Completely unsatisfactory
 - u ungraded
 Note that the worst-case Source and Treatment Grade is written in front to give the overall grading for water to consumers.
- Name of District Health Board (DHB) or contracted organisation responsible for Health District
- Lines indicate piping connections between sources, treatment plants and distribution zones

If you are concerned by your grading . . .

The *Register* shows the gradings for supplies, but it does not go further. For a low grading, it does not say exactly why it is low, or what would make it higher.

A grading below Cc is unsatisfactory. The grading may arise for a number of reasons, including:

- The quality of the water is poor.
- The quality is unknown because monitoring is inadequate.
- Quality may be adequate most of the time, but the risk of quality deteriorating without users knowing is significant. In other words, there are inadequate barriers against contamination.

Note that in each case the solution will probably require money, although in some situations improved management of the resource may significantly affect the grading allocated.

The emphasis in the grading, and in the *Drinking-Water Standards for New Zealand 2000*, is on “demonstrable quality of water”, that is not just “it seems OK”, but “it is safe and we have taken measures so that any risks to its quality are minimal”.

If you are concerned about your supply's grading or water quality, contact those responsible for your supply, who are usually your city or district council (check your *Register* entry).

Summary Information

A. Distribution of Priority 2 determinands

The two tables below show the 449 Priority 2 determinands currently assigned. 397 determinands are assigned to 193 different distribution zones, and 52 to 51 treatment plants. The most Priority 2 determinands currently allocated to a single zone is eight.

The lists are sorted with the most commonly allocated determinands first.

Distribution Zones

Determinand	Zones	Zone population
Lead	112	455,971
Nickel	52	455,720
Trichloroacetaldehyde	44	229,238
MAV sum ratio for HAAs	39	152,469
Arsenic	22	113,097
Cadmium	22	33,627
Copper	21	42,386
MAV sum ratio for THMs	20	83,920
Dichloroacetic acid	17	54,870
Aggressive water	14	240,478
Trichloroacetic acid	12	36,123
Antimony	6	122,894
Bromodichloromethane	4	14,080
Nitrate (as NO ₃)	4	
Aggressiveness to be resolved	3	
Boron	2	
Chlorate		44,000
	1	600
	1	1,152

Treatment Plants

	Plants	Connected Zones	
Fluoride	47		2,386,446
	4	5	
Nitrate (as NO ₃)		4	14,942
	1		900

B. Major community drinking-water supplies

The following list summarises the 44 largest supplies in New Zealand, each of which serve 10,000 people or more. The full *Register* defines 2,011 supplies serving 3,514,661 people. These 44 supplies serve 2,789,971 people, which is 79% of those in registered supplies or about 69% of the New Zealand population. Communities are in alphabetical order.

The list uses the following format:

Community name	Population	
└ Zone name	Population	Plant+Zone grading

To see the full entry for each supply, refer to the main tables.

<p>Ashburton 15,000</p> <ul style="list-style-type: none"> └ Ashburton 15,000 ub <p>Auckland City 362,850</p> <ul style="list-style-type: none"> └ Auckland 217,000 Aa └ Central Business District Auckland 8,650 Aa └ Hillsborough 40,000 Aa └ Maungawhau 37,600 Aa └ Mt Hobson 26,250 Aa └ Onehunga 20,250 Aa └ Otahuhu 13,100 Aa <p>Auckland South, Manukau City 287,000</p> <ul style="list-style-type: none"> └ Earls Court 5,000 Aa └ High Head 6,000 Aa └ Manukau Misc. 256,000 Aa └ Papatoetoe 20,000 Aa <p>Blenheim 21,588</p> <ul style="list-style-type: none"> └ Blenheim 21,588 ub <p>Cambridge 13,503</p> <ul style="list-style-type: none"> └ Cambridge 13,503 ub <p>Christchurch 292,000</p> <ul style="list-style-type: none"> └ Central Christchurch 175,000 Ba └ North-West Christchurch 70,000 Ba └ Parklands 7,000 Ba └ Riccarton 7,000 Ba └ Rocky Point 3,000 Ba └ West Christchurch 30,000 Ba <p>Dunedin City 89,181</p> <ul style="list-style-type: none"> └ Booth Road, Dunedin 30,841 Ed └ Green Island 6,409 Ed └ Low Levels/Peninsula, Dunedin 33,728 Ed └ Maori Hill 12,441 Ec └ Port Chalmers 2,469 Ed └ Wingatui, Dunedin 3,293 Bd <p>Feilding 13,000</p> <ul style="list-style-type: none"> └ Feilding 13,000 ub <p>Gisborne City 30,000</p> <ul style="list-style-type: none"> └ Gisborne City 30,000 Aa 	<p>Hamilton 117,100</p> <ul style="list-style-type: none"> └ Hamilton City 117,100 Aa <p>Hastings City 45,715</p> <ul style="list-style-type: none"> └ Flaxmere 11,324 Ba └ Hastings East 13,562 Bu └ Hastings West & Central 20,829 Bu <p>Havelock North 11,623</p> <ul style="list-style-type: none"> └ Havelock North 11,623 Bb <p>Hawera 10,720</p> <ul style="list-style-type: none"> └ Hawera 9,500 Ab └ Normanby 850 Ab └ Ohawe Beach 270 Ab └ Okaiawa 100 Ab <p>Hibiscus Coast 19,570</p> <ul style="list-style-type: none"> └ Hibiscus Coast 19,240 Aa └ Waiwera 330 Aa <p>Invercargill 50,456</p> <ul style="list-style-type: none"> └ Bluff 2,956 Bc └ Invercargill City 47,500 Ba <p>Levin 20,000</p> <ul style="list-style-type: none"> └ Levin 20,000 Cb <p>Lower Hutt 95,469</p> <ul style="list-style-type: none"> └ Eastbourne 4,704 Bb └ Haywards 372 Aa └ Lower Hutt 56,103 Bb └ Petone 8,034 Bb └ Stokes Valley 9,198 Aa └ Wainuiomata 17,058 Ba <p>Massey University 12,000</p> <ul style="list-style-type: none"> └ Massey University 12,000 Aa <p>Masterton 19,000</p> <ul style="list-style-type: none"> └ Masterton 19,000 Aa <p>Napier 47,900</p> <ul style="list-style-type: none"> └ Napier City 25,800 Bb └ Taradale 22,100 Bb <p>Nelson 40,000</p> <ul style="list-style-type: none"> └ Nelson City 20,000 Ed └ Stoke 20,000 Ed
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New Plymouth	48,777			Te Awamutu & Pirongia	10,296		
└ Bell Block	4,437	Aa		└ Pirongia	1,131	Ab	
└ Lepperton	300	Ab		└ Te Awamutu Township	9,165	Ab	
└ New Plymouth	35,700	Ab		Te Puke Eastern Districts	12,319		
└ Urenui/Tikorangi	840	Au		└ Gibraltar Water Supply	60	u	
└ Waitara	7,500	Ab		└ Maketu	3,600	u	
North Shore	207,714			└ Ngaupuri Scheme	60	Eu	
└ North Shore Central	51,199	Aa		└ Te Puke	6,612	Ed	
└ North Shore East	44,262	Aa		└ Te Puke (Bush)	100	Eb	
└ North Shore North	22,899	Aa		└ Te Puke Eastern Districts	1,887	Eb	
└ North Shore South	89,354	Aa		Timaru City	26,832		
Oamaru	10,487			└ Timaru	26,832	Ca	
└ North End Oamaru	5,000	Ec		Tokoroa	16,000		
└ Reservoir Road, Oamaru	900	Ed		└ Tokoroa	16,000	Aa	
└ South Hill, Oamaru	4,587	Ed		Upper Hutt	34,650		
Palmerston North City	70,800			└ Pinehaven	3,090	Aa	
└ Aokautere	2,000	Aa		└ Upper Hutt Central	31,560	Aa	
└ Fitzherbert West	300	Aa		Waitakere City	170,720		
└ Kelvin Grove	3,500	Aa		└ Glen Eden / New Lynn	51,300	Aa	
└ Palmerston North City	65,000	Aa		└ Henderson	110,200	Aa	
Papakura	39,600			└ Huia Village	460	Aa	
└ Papakura City	26,800	Aa		└ Laingholm	2,460	Aa	
└ Red Hill	2,500	Aa		└ Montana	4,100	Aa	
└ Takanini	10,300	Aa		└ Oratia	1,330	Aa	
Paraparaumu	22,400			└ Te Henga	870	Aa	
└ Paraparaumu	22,400	Aa		Wanganui	39,000		
Porirua	46,444			└ Aramoho	5,000	u	
└ Mana/Plimmerton/Paremata	5,184	Ab		└ Wanganui City	29,000	Da	
└ Porirua High Level	15,398	Aa		└ Wanganui East	5,000	u	
└ Porirua Low Level	16,924	Ab		Wellington City	165,126		
└ Pukerua Bay	1,656	Aa		└ Brooklyn	9,765	Bb	
└ Whitby	7,282	Aa		└ Churton	4,446	Aa	
Pukekohe	14,812			└ Eastern Wellington	16,815	Bd	
└ Anzac	2,662	ue		└ Johnsonville	18,357	Ba	
└ Hilltop	650	ud		└ Karori	13,146	Bb	
└ Kitchener	11,500	ue		└ Kelburn	9,924	Bb	
Queenstown	10,500			└ Onslow	11,883	Ba	
└ Kelvin Heights	2,500	Eb		└ Southern Wellington	30,024	Bb	
└ Queenstown	8,000	Eb		└ Tawa	12,903	Ab	
Rangiora	12,000			└ Wadestown	6,789	Ba	
└ Rangiora	12,000	uc		└ Wellington Central	31,074	Ba	
Richmond	10,500			Whakatane	21,000		
└ Richmond	10,500	Ec		└ Ohope	6,000	Ba	
Rotorua Central	42,500			└ Whakatane	15,000	Ba	
└ Rotorua City	42,500	Ba		Whangarei	55,200		
Tauranga	88,619			└ Whangarei	48,000	Bb	
└ Mt Maunganui – Papamoa	44,000	Aa		└ Whangarei Heads	7,200	Ba	
└ Tauranga - Bethlehem	44,619	Ab					

C. Health Districts, District Health Boards, Territorial Authorities and Public Health Services

Health District	District Health Board	Territorial Authority	Public Health Service
Northland	Northland	Far North District Kaipara District Whangarei District	Primary and Community Health Services, Northland DHB
North West Auckland	Waitemata	North Shore City Rodney District Waitakere City	Auckland Regional Public Health, Auckland DHB
Central Auckland	Auckland	Auckland City	
South Auckland	Counties Manukau	Franklin District Manukau City Papakura District	
Waikato	Waikato	Hamilton City Hauraki District Matamata-Piako District Otorohanga District South Waikato District Thames-Coromandel District Waikato District Waipa District Waitomo District	Health Waikato, Waikato DHB
Ruapehu (North)		Ruapehu District (North)	
Tauranga	Bay of Plenty	Tauranga District Western Bay of Plenty District	Toi Te Ora Public Health, Bay of Plenty DHB
Eastern Bay of Plenty		Kawerau District Opotiki District Whakatane District	
Rotorua Taupo		Lakes Rotorua District Taupo District	
Gisborne	Tairāwhiti	Gisborne District	Public Health Unit, Tairāwhiti DHB
Hawkes Bay	Hawke's Bay	Wairoa District Chatham Islands County Hastings District Napier City Central Hawkes Bay District	Public Health Unit, Hawke's Bay DHB
Taranaki	Taranaki	New Plymouth District South Taranaki District Stratford District	Public Health Unit, Taranaki DHB

Health District	District Health Board	Territorial Authority	Public Health Service
Ruapehu (South) Wanganui	Whanganui	Ruapehu District (South) Rangitikei District Wanganui District	MidCentral Health, MidCentral DHB
Manawatu	MidCentral	Horowhenua District Manawatu District Palmerston North City Tararua District	
Wellington	Capital and Coast	Kapiti Coast District Porirua City Wellington City	Regional Public Health, Hutt Valley DHB
Hutt	Hutt	Lower Hutt City Upper Hutt City	
Wairarapa	Wairarapa	Carterton District Masterton District South Wairarapa District	
Nelson- Marlborough	Nelson Marlborough	Tasman District Nelson City Marlborough District	Public Health Unit, Nelson-Marlborough DHB
West Coast	West Coast	Buller District Grey District Westland District	Community and Public Health, Canterbury DHB
Canterbury	Canterbury	Banks Peninsula District Christchurch City Hurunui District Kaikoura District Selwyn District Waimakariri District	
South Canterbury	South Canterbury	Ashburton District Mackenzie District Timaru District Waimate District	
Otago	Otago	Central Otago District Clutha District Dunedin City Waitaki District	Public Health South, Otago DHB
Southland	Southland	Gore District Invercargill City Queenstown-Lakes District Southland District	

Glossary

This glossary contains terms of interest to *Register* users. Any italicised words in the descriptions are separately defined.

Community All consumers of water, including domestic, commercial, industrial and agricultural users, within a *supply* boundary. A community may have one or more distribution zones within it.

Community Code A unique six-character code defining a *community*. Consists of the first three characters of the community name followed by 001 to 999. First community registered is 001, and so on.

Community Drinking-Water Supply

A publicly or privately owned drinking-water *supply* which serves 25 or more people for at least 60 days per year.

Determinand Sometimes called analyte, parameter, test, species, element or property, it is something determined or tested for in water samples. Some examples are pH, nitrate, copper, faecal coliforms, hardness, conductivity and chloroform.

Distribution Zone Part of a water supply network within which all consumers should receive drinking-water of identical quality. This water is supplied to all consumers from a similar origin or origins, with the same treatment, and through a common reticulation system. A small community will usually have a single zone. Larger towns or cities may have multiple zones because of different sources or source combinations being used, different treatment plants, separate pipe networks, different reticulation characteristics, or some other factor resulting in different or potentially different water quality being received by the consumer.

Drinking-Water Standards for New Zealand 2000

Standards effective from 1 January 2001 defining acceptable drinking-water quality for New Zealand supplies.

MAV Maximum Acceptable Value for no significant health risk as listed in the *Drinking-Water Standards for New Zealand 2000*.

Plant See *treatment plant*.

Plant Code A unique seven-character code defining a *treatment plant*. Code is always TP then a number from 00001 to 99999.

Priority 2 Determinand

A *determinand* designated for a specific *treatment plant* or *distribution zone* according to procedures outlined in the *Drinking-Water Standards for New Zealand 2000* because of a possible health risk to consumers. Generally, if a chemical *determinand* is present in a water supply at a level

above 50% of the listed MAV, then it becomes a *Priority 2 determinand* for that supply. Such supply components must be monitored for the *Priority 2 determinand* at specified intervals until the risk is overcome or shown not to be present.

Public Health Grading

A procedure used by the Ministry of Health to grade public supplies and their components according to the confidence which exists that the water is safe to drink and will continue to be so.

Register of Community Drinking-Water Supplies in New Zealand

The *Register of Community Drinking-Water Supplies in New Zealand* is a compilation of names, codes and relationships that have been allocated to the four components of water supplies, namely *communities*, *distribution zones*, *treatment plants* and *sources*. The *Register* uses information from local authorities checked by District Health Boards, so that each component of each supply has both a unique systematic code and a unique name. The purpose of the *Register* is to provide information on drinking-water supplies to individuals, organisations, and local, regional and national bodies in a consistent non-ambiguous manner, to encourage the use and exchange of related information.

Source	Point of origin or natural water body from which water is drawn to supply a community.
Source Code	Unique six-character text code representing a source. The first character is G, S, M or R for ground, surface, mixed or rain water respectively. Last five are digits 00001 to 99999 for each series (ie G00001, S00001, etc).
Supply	A drinking-water system consisting of one or more <i>distribution zones</i> and their contributing <i>treatment plants</i> and <i>sources</i> . A supply serving 25 people or more for at least 60 days per year is called a <i>community drinking-water supply</i> .
Supply Component	<i>A distribution zone, treatment plant or source.</i>
Treatment Plant	Facility used to treat raw water to bring it up to potable level for a community. Where an actual treatment plant does not exist (eg, an untreated groundwater supply) a nominal plant is named and coded representing the well-head or start of piping. This requirement is necessary to allow information to be stored on storage and treatment (or the lack of it) before reticulation.
Zone	See <i>distribution zone</i> .
Zone Code	A unique eight-character code defining a <i>distribution zone</i> . Created from the six-character <i>community code</i> followed by two letters from the zone name.

Tables 1 to 20 follow

For assistance, try these places . . .

- read the Quick Reference page vii
- look at the explanatory diagrams.....pages 10 and 11
- find a community in the Index at the back.