

7.0 Risk

7.1 Risk to existing water supplies

The following is not intended to represent an analysis of the risks inherent in existing supplies as this is not included within the scope of this report but is intended to identify and highlight risks which may be included in the future development of risk management plans.

Risk allocation eg 'high' 'moderate' etc are assessed in accordance with Appendix 11 of MOH publication 'How to Prepare and Develop Public Health Risk Management Plans for Drinking Water Supplies'

7.1.1 Contamination within the catchment

The increasing use of pesticides and changing farming practices from sheep to dairy increases the risk of contamination. Dairy farming and even effluent ponds are known to be located within water supply protection areas and animals are known to graze within water courses upstream of intakes.

Some raw water sources are known to suffer from microbiological contamination at present and the disinfection plant installed is simple chlorination which is not effective in the destruction of all pathogenic protozoa. Even if it was, there is no standby disinfection plant provided at any site.

The risks thus presented are extreme.

7.1.2 Heavy rain leading to contamination from the catchment

All rural water schemes suffer from discolouration following heavy rainfall events. The risk of contamination at these times is therefore higher than those described in 7.1.1 above.

7.1.3 Illegal connections/tampering

These are known to occur and the risk of contamination occurring are extreme. Tampering can also be the cause of instances of 'no flow' at downstream properties.

7.1.4 Lack of investment, poor maintenance

All schemes suffer from a lack of investment in some way, some more so than others. Risks due to such practice are extreme.

7.1.5 Flooding at the intakes

Low level intakes such as the Lower Waihao and Waikakahi intakes are near to the banks of the Waitaki river. The high risk of damage from flooding is real.

7.1.6 Algal blooms

Algal blooms are known to occur in surface water sources, particularly during the summer months. The treatment plants described previously may not be sufficient to deal with outbreaks and the risk of contamination in such instances would therefore be high.

7.1.7 Animal infestation, dead animals from possum control, hunting etc in water source.

Animals are known to frequent water sources above the intakes and dead animals have been reported to have been removed from these areas. The risk of contamination is therefore extreme.

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7.1.8 Chlorinator failure

Plant failures are a reality rather than a risk. The effects of such failures however may be subject to a fuller risk assessment. There is no standby plant provided at any treatment plant. Such risk is extreme.

7.1.9 Loss of/exhaustion of Chlorine

The intakes are visited periodically by staff and chlorine levels are maintained sufficient for the period between visits. A high risk due to a loss of containment remains however.

7.1.10 Seismic activity

The plans of the water schemes include known geological fault locations. These areas therefore represent the locations where the pipelines are at most risk of fracture. Pipelines particularly sensitive to ground movement are rigid pipes such as those manufactured from asbestos cement (AC). According to the data bases there are some 56 km of AC pipelines across the District. Given the storage requirements of scheme rules and repair response times, the risk is considered as low however.

7.1.11 Power failure

All schemes require power to function correctly even where the luxury of a gravity intake is available. No sites are provided with standby power facilities but in the event that an individual rural site suffers a power failure it is likely that the power will be restored within a period of three days which is the minimum storage requirement stipulated by the schemes rules. In the event that power is unlikely to be restored within 3 days standby generators can be sourced and coupled up to incomers at the site. Should the event causing the loss of power be widespread across the District however sourcing a generator would be likely to prove problematic. The risk must therefore be considered as being high.

The urban scheme has two separate water sources served by separate power distribution systems and a storage reservoir. The risk of power failure is considered low.

More importantly however is where schemes have the luxury of a gravity intake such as Cannington. Here the risk of introducing non-chlorinated water to the reticulation becomes a certainty in the event of a power failure which may be mains or battery pack. The risk associated with such an event is high to extreme.

7.1.12 Pipeline failures

Critical pipelines such as Gap Creek Crossing, Hook River crossings and the Waimate Creek crossings comprise AC, poly, PVC or steel pipes in varying conditions. Failures of the pipelines carry high risk to supply and high risk of contamination. The risks are higher on the rural schemes where instances of connections not in compliance with codes of practice have been found. The urban scheme is pressurised by pumps and by an elevated reservoir reducing the risk of such contamination however.

7.1.13 Farmers/contractors damaging pipes.

This is a reality rather than a risk. The risk of contamination as mentioned above under pipeline failures is relevant.

7.1.14 Booster pumps failure

Booster pumps failures do occur but faults are normally rectified within the stipulated storage period of 3 days. This therefore provides for a low risk estimate.

7.1.15 Low flow periods – no chlorination

Rural scheme chlorinators introduce a pre-set volume of chlorine per minute and are initiated by a flow switch. Those schemes with gravity intakes are therefore at risk of introducing un-chlorinated water when flows are lower than the pre-set limit. The dilution effect however reduces the risk to low.

7.2 Risks to the community relating to the absence of a water supply or a reticulated sewerage system.

7.2.1 Sewerage reticulation

The township of Waimate itself is the only community within the District which is provided with a reticulated sewerage network. Dwellings within communities such as St Andrews, Glenavy and Willowbridge rely on individual or, in some instances shared septic tank facilities which discharge effluent treated to varying degrees to land. All of the more remote farm dwellings discharge sewage to domestic treatment systems.

Many properties within the townships are relatively small and therefore there is a likelihood that the disposal fields are unable to dispose of the volumes of effluent satisfactorily, indeed the resource consent procedures currently in place would preclude most properties in some communities from discharging effluent as a permitted activity, being unable to comply with the criteria governing distances from the outfall to the property boundaries.

The volumes and nature of the effluent discharged from communities not afforded sewerage systems will to some extent present a risk to public health. Discharges from domestic sewage treatment systems may contain pathogenic contaminants such as pathogenic viruses and bacteria that cause disease. These contaminants as well as chemicals and nutrients may also be transported to the water sources presenting further risks.

In summary therefore the risk to the community emanating from properly maintained septic tanks and disposal fields located sensibly and on properties of adequate size to deal with the discharges are low. The risk to the community in more populous areas however can rise to extreme levels.

7.2.2 Water Supply

There are many properties within the District which are not connected to either a council managed water supply scheme or to a private scheme. Many of these are isolated dwellings within more remote areas and are served by private sources.

Other properties reliant on private sources are located within townships such as Willowbridge. In these areas a connection to a public water supply is available, but this option is not always taken up due to the inability of individuals to afford the connection costs or a personal preference not to do so. These areas are not served by sewerage reticulation as discussed above and this enhances the likelihood of the contamination of the water supplies to these communities. Bores have been known to run dry in such areas and the groundwater has been found to be contaminated. The risk to such communities is extreme.

8.0 Quality and Adequacy of Water Supplies

8.1 Water Quality

None of the water supplies in the District comply fully with the requirements of the NZ Drinking Water Standards which were published in August 2005. Steps are taken however to strive towards compliance with the microbiological requirements of those standards and sampling results from the urban scheme would indicate compliance although the testing regime followed and plant installed is insufficient to warrant an improvement in the grading afforded to the plant by the MOH. Recent reevaluation by the Drinking Water Assessor late in 2005, showed the Urban water system to be at level Ee.

Water sampling is carried out by Council staff weekly on Tuesdays. The smaller schemes of Cannington and Waihaorunga are exceptions however, being sampled every fortnight due to their lower populations.

Sampling is carried out by Council operatives, collected by courier and dispatched to Citilab in Dunedin for bacteriological testing. In the event that E-Coli is found to be present Citilab advise the Council immediately.

Data is provided annually to MOH.

It will be noted that failures have been recorded in recent times on all schemes other than the urban supply and the Hook Waituna Rural Water Supply. No testing other than bacteriological testing has been carried out for some years on any scheme however and recently asset management plans have been prepared.

The Ministry of Health grading for each of the water supply schemes is given under their respective descriptions in Section 4. Clearly, considerable investment is required to raise the standards, particularly in the rural sector. Currently there are budget proposals in place at the present time to effect improvements in order to achieve compliance with the NZ Drinking Water Standards 2005 which are to become mandatory in the near future. The 'unsatisfactory – high level of risk' or 'completely unsatisfactory – very high level of risk' gradings as allocated to all the water supplies within the District and as published in MOH document 'Register of Community Drinking Water Supplies' are considered consistent with this assessment.

8.2 Adequacy of water supplies

The urban area is served by two sources with a combined delivery capacity in the region of 60 l/s. For the vast majority of the year the delivery requirement is less than the 20 l/s capacity of the Manchesters Rd bore and therefore the Timaru Rd bore remains as standby. During periods of hot dry weather in the summer months however demand increases above 20 l/s as garden irrigation increases and the Timaru Rd bore is called in to assist mode. No water supply restrictions have been put in place in recent years. The water supply is therefore considered adequate as far as volume is concerned.

The rural areas are served with plentiful water to meet human demand. Much of the water delivered to the region is intended for use by stock however and this use places an ever increasing burden on the supplies. Whilst the stock demand for water lies outside the scope of this assessment, it should be noted that once stock is introduced to the land the first call on the available water will be by the stock. Should supplies be inadequate at any time to cope with this demand, the delivery to many dwellings will be affected.

Recent enhancements to the Hook, Waihaorunga and Otaio Rural Water Supply Schemes has increased delivery volumes. A study for enhanced supply on the Waikakahi Rural Water Scheme is in progress.

Whilst the water supply itself may be adequate when systems are operating normally, inadequacies remain within the plant and the reticulation networks themselves. The rural water schemes are heavily exposed to single point failures including pumps, chlorinators and pipelines as discussed elsewhere in this document. Management is focussed on reactive repair rather than proactive maintenance and the lack of investment is evident.

There remain many properties on the fringes of reticulation networks where extensions to those networks could avail water to those properties. Any extensions would be paid for on a 'user pays' basis

9.0 Quality and quantity of Discharged Waste Water

The Waimate Waste Water Treatment Works (WWTW) is the only communal waste water treatment plant within the District. Individual or, in some cases, shared septic tanks serve other dwellings.

The WWTW plant was commissioned in February 2004 and has now passed from its commissioning period as stipulated by the various Consents which govern the discharges. The monitoring reports by ECan for the year 2004-05 indicate full compliance with the monitored conditions. The summary of the Annual Report on the WWTW and the Compliance Monitoring reports by ECan may be read at Appendix B.

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10.0 Current and estimated future demands for water and waste water services and a consideration of options available to deliver the requirements to the community.

The District population has not increased for some years and there is no evidence to demonstrate that it will do so. A projected population to the year 2016 is given at Appendix I. This representation indicates that the population will decline from the present level of 2745 to around 2200 by the year 2016. In human terms therefore there will be no demand for increased supplies due to an increasing population. There may however be an increased demand should additional dwellings be connected to rural water schemes.

Notwithstanding the foregoing the volumes of water currently supplied are considered adequate for the needs of the human population, but ever increasing pressures come to bear on the rural water schemes where the demand for stock water increases as the financial benefits of cattle as opposed to sheep farming are sought by the farming community. Much of the water supplied via the rural water schemes is consumed by stock or is wasted.

The population of the township of Waimate is also not expected to show any increases to year 2016, having been in steady decline for some years. The capacity of the waste water treatment facility is therefore considered as being well equipped to deal with dry weather flows now and for the foreseeable future. Difficulties do arise in periods of prolonged wet weather however due to the susceptibility of the sewerage network to infiltration as flows increase substantially during rainfall events. Stormwater connections are therefore likely to be present within the catchment.

The Waimate urban water supply is in a similarly robust condition in terms of the volumetric supply. The Manchesters Road bore (which delivers around 20 l/s) is easily capable of delivering the towns requirements for most of the year and is only assisted by the Timaru Rd bore (which delivers an additional 40 l/s) when periods of hot dry weather are experienced in the summer months and the townsfolk water their gardens.

It is therefore considered that in the context of this section (which considers the human consumption element and the volume of water supplied only) that the supplies currently provided are adequate and will be for some considerable time.

The quality of the water supplied is considered at Section 8.

11.0 Sanitary services provided within the District

11.1 General

'Sanitary Services' is defined in accordance with the description of 'Sanitary Works' as per the Health Act 1956 and thus includes drainage works, sewerage works (and works for the disposal of sewage), waterworks, works for the collection of refuse, public conveniences, swimming baths, dressing sheds, cemeteries, crematoria, disinfection and cleansing stations.

Waterworks are described elsewhere in this document, drainage (stormwater) works and refuse collection are the subject of a separate report and this section of the report therefore describes those other elements of sanitary services defined above.

11.2 Public Conveniences

Public conveniences are provided and connected to the urban sewerage network at Queen Street and at Victoria Park. Ablution facilities are provided at the remote camping grounds described earlier, these, as well as a toilet block at the Waitaki Mouth rest area and an ablution block at Knottingly Park camp site discharge to septic tanks which are subject to resource consent procedures.

The four main camp sites described earlier in this report area are also equipped with dump stations for the receipt of caravan effluent. These stations are sealed and their contents are removed periodically by tankers.

11.3 Swimming Baths

The Norman Kirk public swimming pool is located on Queen Street Waimate. The pool is heated and is open during the late spring, summer and early autumn.

As well as being open to the public in general the pool is also used by local schools for swimming lessons, galas and inter-school galas.

The pool provides changing and ablution facilities.

11.4 Dressing sheds

Changing facilities are provided at the public swimming pool as noted above.

11.5 Cemeteries

The main cemetery is located at Mcnamaras Rd, on the outskirts of the township. Toilet facilities are provided served by a septic tank. Water is supplied from the urban water scheme.

11.6 Crematoria

There are no crematoria within the District of Waimate.

11.7 Disinfection and Cleansing Stations

There are no such facilities within the District of Waimate.

11.8 Refuse Disposal

Refer Appendix C

All camp sites under council administration are provided with 44 gallon drums for use as refuse collection bins. These are also located around the shorefront of the Waitaki lakes.

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12.0 A forecast of future demands for sanitary services and a consideration of options available to deliver the requirements

As stated earlier in this report the potential for future growth in Waimate is low. The likelihood is therefore that the capacity demand is likely to remain static.

The requirement to improve on the services already provided however is self evident. The waste water treatment plant suffers from high levels of infiltration during rainfall events and this may contribute to the failure of the plant to treat the waste water to the levels demanded by the Consents currently in place. A programme to address the issue of diversion of roof water from sewer connections will be developed this year.