



# **Ruapehu District Council**

## **Assessment of Water and Sanitary Services**





**Ruapehu District Council**  
**Assessment of Water and Sanitary Services**  
**Table of Contents**

1.0	Overview	2
2.0	The Ruapehu Environment	6
3.0	Overview of Ruapehu District Council Services	13
4.0	Ohura Ward	18
5.0	Taumarunui Ward	36
6.0	National Park Ward	62
7.0	Waimarino Ward	94
8.0	Waiouru Ward	129
9.0	Conclusion	136
	Appendix 1 Risk Assessment	139
	Appendix 2 Component Inventory	154
	Appendix 3 District Landfill	168

## **1.0 OVERVIEW**

### **1.1 WHAT IS THIS ASSESSMENT?**

1.1.1 This Assessment provides information to the Ruapehu community on the Water and Sanitary services provided by various organisations, including Council, within the Ruapehu District with the main focus being on the impact of these services on public health and the environment.

This assessment must describe the nature of the services and how good (or not so good) they currently are. It must explore current and future demands and also the advantages, disadvantages and risks that may affect services in the future. It must explore the different options for meeting future demands and the advantages, disadvantages and risks that may affect them in the future.

1.1.2 In summary, this assessment is required to provide information on:

- Water services including:
  - Water supply,
  - Wastewater treatment and disposal, and
  - Stormwater, and
- Sanitary Services including,
  - Public toilets,
  - Crematoria,
  - Cemeteries, and
  - Solid Waste Management.

1.1.3 Section 129 of the Local Government Act 2002 gives guidance as to the extent of information required in this Assessment. In particular it advises that:

- Council must use its best endeavours to make a full and balanced assessment,
- The information required should be to the extent that the territorial authority considers appropriate, having regard to:
  - The significance of the information,
  - The costs and difficulty in obtaining the information,
  - The extent of the territorial authorities resources.
- The extent of which the above factors have impacted on the completeness of the assessment.

1.1.4 In preparing this assessment, while all known schemes have been assessed; Council has concentrated its information gathering and analysis on areas or schemes that are known to raise concerns. In respect to the timing of the assessment the first assessment must be completed by July 2005. It is recommended that they be repeated at 5-yearly intervals. The time horizon for assessing “future demand” and programming responses to issues is identified as 10 years.

- 1.1.5 This Assessment covers all water and sanitary services provided within the Ruapehu District (see Map 1) including those services not provided by Council, that Council has knowledge of.

## **1.2 WHY IS COUNCIL UNDERTAKING THIS ASSESSMENT?**

- 1.2.1 Under the provisions of Sections 123-129 of the Local Government Act 2002, councils are required to prepare assessments of water and sanitary services located within their districts or cities. The core focus of these assessments is on the impact of water and sanitary services, or indeed the lack of adequate systems, on public health and the environment.

- 1.2.2 In making this assessment the Local Government Act requires Council to:

- Consult the Medical Officer of Health,
- Take into account the duties of Council under section 23 of the Health Act 1956,
- Consider in making the assessment of current and future demands for water services the following:
  - The full range of options and their environmental and public health impacts, including:
    - On-site collection and disposal,
    - Grey water and stormwater reuse or recycling,
    - Demand reduction strategies,
    - The full range of technologies available.
  - Any comments from the Medical Officer of Health.

## **1.3 THE CONSULTATION PROCESS**

- 1.3.1 Council is required to undergo a public consultation process in regards to this document using the Special Consultative Procedure. The Special Consultative Procedure requires that:

- A statement of proposal is developed which includes a draft of the Assessment and a summary of the information contained within that draft,
- A statement of proposal must be included on a public agenda of council,
- The availability of the statement of proposal must be advertised in the local newspaper,
- The statement of proposal must be open for submission from the public for a least one month,
- Council must give people the opportunity to speak to their submissions.

- 1.3.2 This Assessment is open for consultation from 6 April 2005. During this time individuals and/or organisations may wish to comment on the information contained in this Assessment. Following this consultation period Council will consider the comments received and amend the Assessment (if necessary) to

reflect community comment. Following adoption by Council, the Assessment results will be added to the 2006 Long Term Plan process.

#### **1.4 WHAT WILL IT BE USED FOR?**

- 1.4.1 This Assessment sets out to compile and assess the available information on water and sanitary services provided within the District, identify any issues with these services, and develop options for addressing these issues.
- 1.4.2 This Assessment aims to inform the community on the state of the water and sanitary services that they make use of and provide an opportunity for members of the public to comment on what they think Council should do to address any of the issues identified.

#### **1.5 STRUCTURE OF THIS DOCUMENT**

- 1.5.1 Part 2 and 3 of this Assessment provide an overview of the Ruapehu District environment and the water and sanitary services provided within the District.
- 1.5.2 This Assessment is divided into five main sections based on the different electoral Wards of the Ruapehu District as at 1 January 2004. The Ward boundaries were changed for the 2004 October Elections.
- 1.5.3 The provision of cemeteries, crematoria, public toilets and solid waste disposal is assessed at this Ward level.
- 1.5.4 In subsequent sections each Ward is then further broken down into communities within the Ward for the assessment of water services.

## **2.0 THE RUAPEHU DISTRICT ENVIRONMENT**

### **2.1 DISTRICT ENVIRONMENT**

- 2.1.1 The area administered by the Ruapehu District Council falls within the Manawatu – Wanganui Region administered by Horizons Regional Council (Horizons). Horizons are primarily the lead agency for all environmental monitoring and regulation.
- 2.1.2 Information provided in this Assessment relates to the impact of Council and non-Council water and sanitary services on the surrounding environment. Horizons hold information as to the number and impact of resource consent holders in relation to these activities within the District. Map 2 provides an overview of the major resource consents, including “Discharge to Water”, “Water Extraction” consents and sampling points, within the District.
- 2.1.3 In April 2004 Horizons released “Taking the Pulse”. This report provides further information on the environment at the regional level. The purpose of “Taking the Pulse” is to provide background information on the Manawatu – Wanganui Region, and to provide a stock take of the Region’s social, economic, and environmental features. It is anticipated that this report will be reviewed in 2006, to take into consideration the census of that year.

### **2.2 NATURAL HAZARDS**

- 2.2.1 The Manawatu Wanganui Region (of which the Ruapehu District is part) encompasses an area of 22,179 square kilometres, which equates to nearly 10% of New Zealand’s land area, with a total population of approximately 250,000 people. The Civil Defence Emergency Management Group Plan for the Manawatu Wanganui Region identifies hazards for the region. The following table outlines the natural hazards identified in the Region.

Hazard	Context	Likelihood	Consequences
<b>Volcanic Action</b>	<p>The Manawatu-Wanganui region includes part of the Taupo volcanic Zone, which is an area of exceptionally active volcanoes. Western parts of the region are also subject to ash fallout involving Mt Taranaki. Studies show that the most hazardous volcanoes are Ruapehu and the Taupo Caldera. Volcanic hazards are most likely to take the form of either: Lahars or pyroclastic fall (ash). Pyroclastic flow (lava) is unlikely to affect the region as a whole and is predicted to cause localised damage up to 5km radius of the source.</p> <p>This risk description focuses on the likelihood and consequences of a 100-year event involving Mount Ruapehu – this being assessed as the volcano ‘most likely’ to affect the region.</p>	<p>There have been 18 large to moderate events recorded since 1861, which have resulted in 151 deaths the most recent and smallest was in 1995.</p> <p>While it is impossible to determine the exact likelihood and extent of future volcanic activity, history suggests that our volcanoes are not only active but are prone to frequent (5-10 year) events.</p>	<p>Studies have analysed recent volcanic activity and produced a predicted scenario of a 1,000-year event on Mount Ruapehu.</p> <p><b>Lahar</b></p> <p>Subsequent to the 1995 eruption, the Ruapehu crater has developed the potential to deliver a lahar twice the size of that which caused the Tangiwai disaster in 1953. This has been caused by a Tephra blockage in a natural outfall from the crater lake, which allows water levels to reach far greater heights than normal. Depending on weather conditions this situation could occur as early as 2003. The potential consequences of this type of event are:</p> <ul style="list-style-type: none"> <li>• Loss of life to those transiting-crossing points, and near riverbanks,</li> <li>• Bridge and road destruction/damage along Whangaehu River as far as but not including SH3 bridge,</li> <li>• Destruction of intake systems, distribution pipes (water gas, power etc),</li> <li>• Overflow in to other river systems cause water contamination, fish kills etc.</li> </ul> <p><b>Pyroclastic Fall</b> (incl localised rock fall)</p> <ul style="list-style-type: none"> <li>• Extensive structure damage and loss of life within 2km radius,</li> <li>• A min 1mm ash over the whole region, depending on wind, causing water and food contamination,</li> <li>• Disruption of human respiratory systems, land transport, airport closures, and electricity generation,</li> <li>• Varying degrees of disruption to agricultural production.</li> </ul>

Hazard	Context	Likelihood	Consequences
<b>Earthquake</b>	<p>The Manawatu-Wanganui Region is geologically diverse and contains at least 39 active fault and fold sources. Parts of the region lie within the most historically seismically active part of the North Island. These include the Wellington and Wairarapa shear faults, faults in the Wanganui Basin and the Taupo Volcanic Zone.</p> <p>Some major population centres west of the Tararua ranges are also located on soils that are unstable and tend to amplify the intensity of an earthquake.</p> <p>Some 840 moderate quakes have been recorded over the period 1840 – 1992. These included: 5 @ M7-8, 12 @ M 6-7, and 74 @ M 5-6.</p> <p>MK = Magnitude on Richter Scale, which is strength of the earthquake at its source.</p>	<p>The region has a 1 in 10 chance in any 10-15 year period of experiencing a MM 7-8 earthquake. There is a 1 in 10 chance in any 100-year period of experiencing a MM 7.5-9.8 earthquake.</p> <p>MM = Modified Mercalli index which measures the “felt” intensity of an earthquake at any particular location rather than the source.</p>	<p>The consequences of a quake vary throughout the region, and to a large degree are dependant on population centres and the nature of the ground where they are located. The Palmerston North, Foxton, Fielding, Levin, and Wanganui centres are all based on alluvial soils and sand sediments, which are prone to excessive movement (therefore adverse consequences) as a result of a quake.</p>
<b>Flooding</b>	<p>Large parts of the Manawatu – Wanganui region are at risk of flooding, or the effects of flood causing systems.</p> <p>Flooding occurs frequently, with the frequency of an event decreasing in relation to its magnitude. The frequency of a certain magnitude event can be defined for most major river systems, and can be estimated for smaller systems.</p> <p>Flood protection exists along the lower reaches of most major river systems, and around most population centres. Protection is in the form of stopbanks, detention dams and spillways, and tree plantings.</p>	<p>The risk of flooding is an ever-present reality for many parts of our region- particularly during Winter and Spring.</p> <p>Despite the mitigation measures mentioned earlier, the likelihood of a major flood occurring somewhere in the region, during any calendar year is high.</p>	<p>The potential impacts of flooding are listed below. The probability and severity of these impacts increases with event magnitude.</p> <p><u>Human:</u></p> <ul style="list-style-type: none"> <li>• Loss of Life</li> <li>• Evacuations</li> </ul> <p><u>Economic</u></p> <ul style="list-style-type: none"> <li>• Damage to property – farmland, buildings, and infrastructural assets.</li> <li>• Damage to or closure of road and rail networks</li> <li>• Loss of stock</li> <li>• Contamination of water and land</li> </ul>

Hazard	Context	Likelihood	Consequences
<b>Flooding Ctd</b>	<p>The level of protection provided by these measures is highly variable from a minimum of 5-year flood event protection in more isolated areas to 1,00-2,000 year flood event protection through Palmerston North. Generally protection caters for a 20-50 year event.</p> <p>Horizons Regional Council operates an early warning system to inform people at risk of flooding of an impending flood wave.</p> <p>Flooding tends to be short lived with floods passing in two days or less. The effects however, can last significantly longer.</p>		<p><u>Contaminants</u></p> <ul style="list-style-type: none"> <li>• Biological</li> <li>• Chemical</li> <li>• Vegetative</li> <li>• Debris</li> </ul> <p>Severe flooding is generally restricted to one or two of the regions major catchments at any one time, so impacts are generally localised. However, loss of road/rail networks can have wider economic impacts.</p>
<b>Land Subsidence</b>	<p>Much of New Zealand's rugged landscape has evolved through landslides and debris flows. Their activity poses a continuing threat to our communities and infrastructure. Within the Manawatu-Wanganui region several unique landforms can be identified, ranging from mountain ranges and hill country to coastal sand dunes. Many of which are susceptible to land subsidence.</p> <p>Unvegetated hill country, riverbanks, and sand dunes are particularly prone to subsidence, and associated land stability hazards like erosion and landslips. The causes of which are directly attributable to natural and human factors, including</p> <ul style="list-style-type: none"> <li>• Geological Composition</li> <li>• Rainfall</li> <li>• Seismic Activity</li> <li>• Human interference</li> </ul>	<p>The likelihood of a land subsidence event is connected to the severity and frequency of the causation factors.</p> <p>In this region the likelihood of land subsidence is relatively high during the winter months when most of the rainfall is received.</p> <p>Land slipping, slumping, riverbank erosion and sand dune subsidence is likely to occur on an annual basis.</p> <p>Debris flows and river blockages resulting from subsidence are likely to be more infrequent.</p>	<p>Within the Manawatu – Wanganui Region the Taihape Slip would pose the greatest threat to urban settlements. The Taihape Slip is an isolated case however, and it must be made clear that land subsidence predominantly occurs in rural, unpopulated areas.</p> <p>Debris flows largely occur in uninhabited mountainous areas such as the Tararua and Ruahine Ranges, thus posing minimal threat to humans. Movement of large rock material may result in damage to farm property. Temporary river/stream blockage may occur.</p> <p>Landslips, slumps, sand dune and riverbank erosion are unlikely to cause loss of life. The major consequences would be disruption to infrastructure, particularly road/rail facilities in rural areas. Blockage of major arterial routes is most likely to occur at: Manawatu Gorge, Mangaweka deviation, Utiku Slump, SH4 near Taumarunui and SH43 between Taumarunui and Stratford.</p>

Hazard	Context	Likelihood	Consequences
<p style="text-align: center;"><b>Land Subsidence ctd</b></p>	<p>Throughout the region there is an increasing demand for intensive development (such as lifestyle blocks) in areas that are prone to land subsidence. This demand increases the risk of property damage</p>	<p>Land subsidence is likely to be concentrated in rural, hill country areas. Therefore, the probability of a life threatening land subsidence event in a populated area is low.</p>	<p>Urban utilities may be disrupted in isolated events. Most consequences would involve, loss of topsoil/pasture, stock death, and damage to buildings in rural areas.</p> <p>Future urban growth into rural land prone to subsidence could enhance the risk to urban dwellings. Such risks as these can be managed by linking urban development planning with emergency management plans.</p>

Table 1 – Manawatu – Wanganui Region Identified Natural Hazards

2.2.2 Council is in the process of producing separate Emergency Management Plans for the North (Ohura, Taumarunui and National Park Wards) and South (Waimarino and Waiouru Wards) of the District. These Plans are currently in draft stage and identify and rank the various hazards faced by the District. Each hazard is rated using the following criteria

- History: Each hazard is rated on the number of occurrences in the area within the last 25 years: Low = 0-1 occurrence, Medium = 2-3 occurrences, High = More than 3 occurrences.
- Vulnerability Estimates of vulnerability include consideration of where people live in relation to the hazard, what the land is being used for, and the value of the property in or near the risk area. The rating is then based on the percentage of people and property that may be significantly affected: Low = <1%, Medium = 1-10%, and High = >25%.
- Maximum Threat This examines the worst-case scenario in terms of the worst conceivable impact to human life and property that could result from an occurrence: High = more than 25% of the population and property affected, Medium = 5-25% of the population and property affected, Low = Less than 5% of the population and property affected.

**2.2.3 Northern Ruapehu Area**

The northern Ruapehu area consists of three electoral wards namely: Taumarunui, Ohura and National Park. This land area is land locked with a population of 5592 (statistics NZ 2001 census). The area’s landscape is diverse ranging from pastoral hill country land and indigenous forest to the Volcanic Plateau.

**Hazard and Risk Assessment**

The following table provides an overview of identified natural hazards and is ranked in order of priority for the Northern Ruapehu Emergency Management Area.

Priority	Hazard	History	Vulnerability	Maximum Threat	Probability
1	Volcanic Action	High	High	High	High
2	Avalanche	High	High	High	High
3	Adverse Weather	High	High	High	Medium
4	Whiteout	High	High	High	Medium
5	Flooding	High	Medium	Medium	Medium
6	Rural Fire	High	Low	Low	High
7	Earthquake	High	Low	Medium	Low
8	Land Subsidence	High	Low	Low	Low

Table 2 Hazard and Risk Assessment Northern Ruapehu

### 2.2.4 Southern Ruapehu Area

The southern Ruapehu area consists of two wards, Waimarino and Waiouru. This land area is landlocked with a population of 4011 (Statistics NZ Census 2001). The area's landscape is diverse ranging from pastoral hill county land and indigenous forest to the Volcanic Plateau. The major towns of the area are Ohakune, Raetihi, and Waiouru.

#### **Hazard and Risk Assessment**

The following table provides an overview of identified natural hazards and is ranked in order of priority for the Southern Ruapehu Emergency Management Area.

<b>Priority</b>	<b>Hazard</b>	<b>History</b>	<b>Vulnerability</b>	<b>Maximum Threat</b>	<b>Probability</b>
1	Adverse Weather	High	High	High	Medium
2	Whiteout	High	High	High	Medium
3	Volcanic Action	High	High	High	Low
4	Earthquake	High	Low	High	Low
5	Rural Fire	High	Low	Low	High
6	Avalanche	High	Low	Low	High
7	Flooding	Low	Low	Low	Low
8	Land Subsidence	Low	Low	Low	Low

Table 3 Hazard and Risk Assessment Southern Ruapehu

## **3.0 OVERVIEW OF RUAPEHU DISTRICT COUNCIL SERVICES**

### **3.1 PUBLIC TOILETS**

#### **3.1.1 Council Services**

Council operates and maintains public toilet facilities in Ohura, Taumarunui, National Park, Ohakune, Raetihi, Tangiwai, Waiouru, and Pipiriki. These facilities are fully funded by ratepayers, and no 'pay toilets' or user charges are required for the use of these facilities.

#### **3.1.2 General Environmental and Public Health Effects of Public Toilets**

There is low possibility of minor effect to the environmental or public health in the event of a septic tank overflow or major sewage pipe blockage or breakage in a flood or a earthquake event. The public would be aware of the effects through media coverage of such events. Council would be taking action to mitigate and remedy any overflow directly into the environment in such an event.

### **3.2 CEMETERIES AND CREMATORIA**

#### **3.2.1 Crematoria**

There are no crematoriums in the Ruapehu District. When District residents require these services generally the crematoria at Taupo, or Wanganui and occasionally Hamilton are used. As there are no crematoria within the District crematoria will not be further discussed in this Assessment.

#### **3.2.2 Cemeteries**

There are eleven cemetery reserves vested in the Ruapehu District Council situated within the District. Two of these reserves, namely Tatu and Taumarunui Old cemeteries, are no longer capable of providing further burial plots. The remaining nine cemeteries are situated at Ohura, Matiere, Taumarunui, Manunui, Owango, Raurimu, Raetihi, Ohakune, and Rangataua.

#### **3.2.3 Urupa (Traditional Maori Cemeteries)**

Council holds relatively little information on the location and siting of Urupa within the District. The demand for these facilities or number of burials at these sites is also unknown. Where Council hold information on Urupa, this is provided in the relevant section of each Ward section. Where no further information is held, no further discussion on Urupa is provided.

#### **3.2.4 General Environmental and Public Health Effects of Cemeteries and Crematoria**

There is no known adverse effect on either the environment or public health from the operation of cemeteries in the Ruapehu District.

### **3.3 WATER SUPPLY**

#### **3.3.1 Council Water Schemes**

The Ruapehu District Council operate and maintain seven water supply schemes throughout the District and bulk water is purchased from the New Zealand Army to supply the residents of the Waiouru township.

In addition there are a number of community operated water supply schemes that supply the needs of smaller rural settlements as well as individual water supplies for rural schools, marae, and the large number of farm properties throughout the District.

#### **3.3.2 Public Health (Drinking Water) Amendment Act**

There is a strong likelihood that the level of service that Council is required to provide from its water supply systems will need to be increased due to the introduction of new legislation in this area. The Public Health (Drinking Water) Amendment Bill is expected to be introduced to Parliament in 2005 and passed in 2005/06. This Bill will require all water supplies to comply with Ministry of Health Guidelines and New Zealand Standards for Drinking Water.

Whilst it is anticipated that the government may allow up to 4 years for smaller schemes to become compliant it is important that Council begin planning for the achievement of these standards at an early stage as the costs of meeting these standards are high, particularly for small communities.

At present Council is planning and budgeting for the necessary upgrades. However, further consultation will need to be undertaken to establish community preferences on this issue. Whilst Council aims to provide the community with the level of service that they prefer, some water treatment options may not be appropriate if the planned changes to laws surrounding water quality are made. As such, Council must work strategically to ensure that all water supplies provide a level of service the communities feel is suitable whilst remaining compliant with all applicable legislative requirements.

#### **3.3.3 General Environmental and Public Health Effects of Water Supply Schemes**

The provision of safe drinking water is considered to be one of the core functions of Council. Safe drinking water enhances the health and well being of communities and reduces the chances of the spread of water borne diseases. It is essential for the running of households as well as businesses and for emergencies such as fire fighting.

Council is bound by a number of guidelines and legislative standards, which not only affect the management of the water supplies but also ensure the sustainability of the environment from which the water is drawn.

### **3.4 STORMWATER**

#### **3.4.1 Council Stormwater Schemes**

Piped or reticulated stormwater collection and disposal systems are limited to the larger townships of Taumarunui, Ohakune, and Raetihi and to a lesser extent in National Park and Waiouru. The stormwater systems in other townships within the Ruapehu District consist mainly of open drainage channels with limited piped sections, informal drainage systems alongside roads or overland flow following natural flow paths.

Historically maintenance of these systems by Council has been limited, but with the introduction of the long term water services maintenance contract an increased level of service is being provided in the urban areas as well as an programmed development of stormwater infrastructure in some areas.

#### **3.4.2 General Environmental and Public Health Effects of Stormwater Schemes**

The environment represents a complex set of systems, both natural and man made, which form the foundation of the Ruapehu Community. Council is committed to protecting the environment from further degradation, and to improving water resources and indigenous flora and fauna.

Council has a lead role in ensuring that local activities and further development of the built environment does not reduce future environmental capacity.

Because public stormwater systems are designed to take stormwater away, inevitably sediment, debris, and waste is collected at the same time. Council recognises this and is implementing practices and procedures designed to handle stormwater and runoff so that not only are people and property protected but the effect that stormwater discharge has on natural watercourses and water quality is mitigated.

### **3.5 SEWERAGE**

#### **3.5.1 Council Sewerage Schemes**

The Ruapehu District Council operate and maintain six sewage collection and treatment schemes throughout the District. In addition the Department of Corrections operate and maintain a small sewage treatment plant at the Ohura Prison, the Department of Conservation operate and maintain a recently upgraded sewage collection and treatment system at Whakapapa Village and the New Zealand Army operate and maintain a sewage collection and treatment system for the Waiouru Army Camp, into which Council discharges sewage effluent collected from the Waiouru township area. For all other un-serviced townships, rural settlements, rural schools, marae and the large number of farm properties throughout the District, sewage is treated predominantly by individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

#### **3.5.2 General Environmental and Public Health Effects of Sewerage Schemes**

The purpose of the sewerage activity is to collect and dispose of sewage in an effective and environmentally acceptable manner. Effective and efficient sewage collection and disposal is essential to protect the environment,

maintain public health and to facilitate further development. The community have indicated that meeting environmental standards is an essential requirement for this activity.

Council is committed to treating sewage in a way so as to improve, promote, and protect public health and the environment. Council aims to ensure that this activity is provided in the most cost-effective and efficient manner in accordance with the Ruapehu Strategic Plan.

### **3.6 SOLID WASTE MANAGEMENT**

#### **3.6.1 Solid Waste Management Plan**

Council's Solid Waste Management Plan (SWAMP) is a tactical plan required under section 279 of the Local Government Act, and guides the future of Council's solid waste services. The current plan is in force until 2006. This plan was adopted following extensive consultation in 2002/2003 and is available from the public counters of Council offices.

SWAMP outlines the desired community outcomes from this service including zero waste, waste separation, environmental protection, and appropriate levels of service, cost minimisation and reduction of cross-subsidisation. These principles have been built into the configuration of transfer stations and collections services, and in the encouragement of recycling to reduce land filled quantity. SWAMP will be reviewed and updated following public consultation in 2006.

#### **3.6.2 Landfill**

Traditionally a dump (hole in the ground for refuse) has serviced each small township in New Zealand. Under the Resource Management Act 1991, dumps and landfills (an engineer designed site for refuse disposal) need to either be closed or apply for resource consents to continue operation. In 1995 Ruapehu District Council applied for consents for the landfills of Ohura and Ongarue townships to continue operation. These landfills have subsequently closed. Each township dump was replaced with a transfer station.

#### **3.6.3 Transfer Stations**

A transfer station is defined as a refuse and recycling storage facility. In general, refuse or non-recyclables are carted from the various transfer stations to the District Landfill in Taumarunui. Recyclables are also collected from transfer stations and are then either transported to the landfill where they may be stored until the quantities are sufficient for further processing, or taken directly to the contractors yard and then to market.

Council's transfer stations were originally designed for domestic refuse only. Council's policy was not to accept bulky objects (whiteware and car bodies) or garden waste at these stations. This restriction was related to the resultant overflowing of refuse and the associated environmental issues. This policy is not enforceable. The capacity to offer further recycling facilities is limited by the physical constraints of the site. Increasing the capacity is possible by increasing the frequency of service (emptying/recycling removal), by increasing the bin capacity or increasing the land area. These options are

constrained by issues of equity affordability and location. The rural transfer stations utilise skip bins, which are emptied at least once a week. These are open bins without lids.

Signs are erected at each transfer station advising the public of the type of wastes acceptable at the relevant transfer station. The public is also informed by means of press releases, pamphlets, and radio promotions as to the types of refuse and recyclables that can be deposited at transfer stations. The depositing of non-conforming material continues to occur at non-attended sites.

#### **3.6.4 Environmental Monitoring**

It is a requirement under the Resource Management Act 1991 to undertake monitoring of the environment to better understand the effects that certain activities are having on the environment. Most transfer station sites fall under the category of permitted activities and do not have resource consents.

To ensure that there are no adverse effects from transfer stations the sites are regularly assessed. A check sheet is provided to staff and is completed each day the site is visited to ensure that the site is well maintained. The contractor is also required to report any issues they observe with the transfer station sites.

#### **3.6.5 General Environmental and Public Health Effects of Solid Waste Activities**

Large Transfer Stations: Waimarino and Taumarunui transfer stations are restricted sites and attended when open. Semi attended transfer stations have semi restricted access into the areas. These sites have higher volumes of material on site and a high potential environmental and public health impacts but the actual risk score is much lower due to management of the sites.

Uncontrolled transfer stations have high potential for public and environmental risk with no control on the type of material that is deposited onsite. Material ranges from odour refuse, nonconforming product to hazardous wastes. The quantities of nonconforming and hazardous waste on sites appear to be increasing due to the different charging regime between the sites. The Hazardous Waste and New Organisms Act is being implemented across the country which is heightening awareness of chemical effects and restricting the material that may be stored onsite without appropriate licence.

There is a trend of reduced risk from the fully attended transfer stations to semi attended to uncontrolled transfer stations. Resource consents are held for the District Landfill until 2020, however, Ministry for the Environment have classified this landfill as Class B. They are clearly signalling that all class B landfills will close in 2010. Resource consent monitoring shows no environmental or public health effects from this site.

The New Zealand Army also run a landfill in Waiouru, which appear to have resource consent compliance issues. The Army are indicating that the site may close unless improvements occur. The Waiouru Township utilise this site and refuse disposal costs will rise substantial if a transfer station is develop in town and refuse is transported to the District Landfill in Taumarunui.

## 4.0 OHURA

### 4.1 INTRODUCTION

4.1.1 The Ohura Ward is the northern most Ward of the Ruapehu District with a population of 1,605 as at census night 2001, and an area of 2052km<sup>2</sup>, making it the Ruapehu's fourth largest Ward by population and second largest Ward by area.

4.1.2 Key Statistics for the Ohura Ward are provided in the following table.

<b>Ohura Ward – Key Statistics</b>	
Population	1,605
Area	2052km <sup>2</sup>
Number of water supply connections	178
Number of properties on metered water supply	3
Number of rateable properties	900
Main Industry	Primary
Possible growth industries	Mining
Rural Settlements	Ohura Township, Waimiha, Ongarue, Matiere
Number of Schools (Waimiha School closed 2005)	3

Table 4: Ohura Ward – Key Statistics

### 4.2 SETTLEMENTS

#### 4.2.1 Ohura Township

There are four settlements in the Ohura Ward. The largest of these settlements is the Ohura Township. Ohura is a small rural township situated northeast of Taumarunui on the revoked State Highway 40 approximately 29km from State Highway 4 and 10km from State Highway 43. The census of usually resident population for the Ohura Township was 222 in 2001, which is a reduction of 153 (-40%) since the 1996 census. The median income of people in the Ohura Township is \$10,990 compared with \$16,700 for the Ruapehu District and \$18,500 for all of New Zealand

The Township was built on an old swamp, which adds to the high flood risk of the area.

The Ohura Prison remains the principal employer in the Township. Senior prison personnel are likely to be on short-term transfers rather than long-term contracts. The township has its own fire and ambulance services, and is surrounded by farm land.

There has been speculation recently as to the re-opening of coalmines located in Ohura. The mining industry may result in an increase in the number of permanent residents in the Ward, however this increase is not

expected to be significant, or to have an impact on the capacity of the existing services in the Ward.

#### **4.2.2 Rural Settlements**

There are three rural settlements in the Ohura Ward. These are Waimiha, Ongarue, and Matiere. These settlements primarily developed as service centres to the local agricultural and horticultural industries.

### **4.3 CEMETERIES**

#### **4.3.1 Services Within The Ohura Ward**

##### **(a) Urupa (Maori Tribal Cemeteries)**

From the information available it is known that there are six Urupa situated within the Ohura Ward.

##### **(b) Cemeteries**

There are three cemeteries within the Ohura Ward. The Tatu cemetery, located on the corner of SH 43 and Wairau Road, is no longer capable of providing further burial plots. Tatu Cemetery was formally closed on the 28<sup>th</sup> of February 1972.

Operational cemeteries are located at Ohura Township and Matiere. These cemeteries are classified as open cemeteries and do not have limitations to plot adornment and accordingly monuments, tablets, fences and in some instances shrubs and small trees marking an individual gravesite are considered appropriate adornments. The following table provides general information on these cemeteries.

<b>Cemetery</b>	<b>Location</b>	<b>Area (ha)</b>	<b>Current and Estimated Future Burials / Year</b>	<b>Estimated Life (years)</b>
Ohura	Manaparare Road	2.5419	2	1,000+
Matiere	Cemetery Road	2.0234	1	1,000+
Tatu	SH 4, Tatu	1.1989	-	Closed 28/02/72

Table 5: Ohura Ward Cemeteries

#### **4.3.2 Demand Projections**

The population of the Ohura Ward and its settlements is not projected to increase, however, the proposed re-opening of a coal mine in the locality may in the short to medium term, stabilise the current decline in population. The farming community is not expected to increase in population. The undeveloped areas in both cemeteries will meet any demand in the foreseeable future.

#### **4.3.3 Risk Assessment**

A risk assessment has been carried out on the cemeteries provided within the Ohura Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Ohura Cemetery services that received a risk profile of 6 or greater. Further information on this risk assessment process is provided as Appendix 1.

#### **4.3.4 Options To Address Future Demand And Public Health And Environmental Issues**

Both Ohura and Matiere cemeteries have very large capacity in their RSA berm section, and the open developed sections of both cemeteries can easily be enlarged to address all future demand in the foreseeable future by relocation of the perimeter fencing around the existing developed areas to incorporate additional capacity from the currently undeveloped area available.

There are no foreseeable environmental issues arising from the operation of the Ohura cemeteries

It would be desirable to have a source of water at the cemeteries, which are remote from any reticulated water supply. This could be achieved with the erection of a small structure housing a water tank to which a tap could be attached to provide a limited source of water that would meet the cultural need of Maori. There are no known public health issues associated with the operation of cemeteries within the Ohura Ward.

### **4.4 PUBLIC TOILETS**

#### **4.4.1 Services Within The Ohura Ward**

There are two public toilet facilities in the Ohura Ward. These toilets are located on the Tui Street extension road reserve, adjacent to the Ohura Memorial Hall and Ongarue Village Road. The Ongarue facility is situated on Tranz Rail land. The structure paid for and installed by the Taumarunui County Council to service the Ongarue Sale Yard events, which were attended by many women for whom there was no toilet facility available.

The Ongarue toilets appear to be connected to an old NZ Rail septic tank. Members of the Ongarue community look after these toilets. The structure is a round concrete tank with separate male and female areas, one pan and hand basin in each area. The toilets are available to the public 24 hours a day, 365 day a year, unless major damage has occurred or proposed major work in progress. This is the only public toilet in the Ongarue/Waimiha area. There are no petrol station or public eating outlets that could provide toilet facilities to patrons or to the travelling public. The use of the toilet facility is unknown. Information available to Council is that the facility was installed principally for public use during stock sales from the stockyards close by.

The Ohura toilets use the same septic tanks as the facilities contained within the Memorial Hall. The septic tank requires cleaning on a more frequent cycle than the average septic tank and cleaning takes place approximately

every two years. The structure is a round plastered tank with separate male and female areas, one pan in each area. The toilets are available 24 hours a day, 365 days a year unless major damage has occurred or proposed major work is in progress. This is the only public toilet between Taumarunui and Stratford. There are no petrol stations or public eating outlets that could provide toilet facilities to patrons.

#### **4.4.2 Demand Projections**

The toilet facility at Ohura is possibly used by through travellers on State Highway 43. Numbers of users are not known but the twice-weekly cleaning cycle meets the current demand for toilet paper and cleaning which is an indication that usage is relatively low.

The Ongarue toilet facility is well used during stock sales at the nearby saleyards but appears to be used on an extremely infrequent basis at all other times. Use patterns are not expected to change in the foreseeable future at either Ohura or Ongarue.

#### **4.4.3 Risk Assessment**

A risk assessment has been carried out on the public toilet facilities provided within the Ohura Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks from the public toilet facilities that received a risk profile of 6 or greater. Further information on this risk assessment process is provided as Appendix 1.

#### **4.4.4 Options To Address Future Demand, Public Health And Environmental Issues**

It is estimated that the use of the Ohura and Ongarue public toilets is by visitors e.g. Ongarue stock sales, or the travelling public. Unless there is a significant increase in the use of SH43 by travellers, demand should remain static. Although both facilities have septic tank waste disposal methods, these are cleaned out on a scheduled cyclic basis. There are no known or predicted environmental issues.

### **4.5 SOLID WASTE**

#### **4.5.1 Services within the Ohura Ward**

##### **(a) Closed Landfills**

The Ongarue and Ohura landfills closed in 1987 and 2002 respectively. Both of these sites are subject to regular monitoring by Ruapehu District Council as a requirement of their resource consents. The results currently indicate no environmental impact on the environment. The Mangakau Stream covers the toe of the Ongarue landfill during a high flood. Although this has occurred on several occasions since the closure of the landfill the integrity of the landfill has not been compromised.

**(b) Un-Consented Landfills**

The Matiere and Waimiha landfills were closed prior to resource consents being required for landfill closures. No monitoring is undertaken at these sites; however there have been no reported incidents in relation to these sites. In general small well-capped old landfills have not created any significant environmental problems.

**(c) Transfer Stations**

The Ohura Ward has four rural transfer stations. These are located in the communities of Ohura, Matiere, Waimiha, and Ongarue. Recycling facilities are provided at all sites, with the Ohura site offering extra recycling facilities. The sites allow 24-hour public access and the contractors empty the skip bins once a week. The refuse deposited at these stations is then transported and disposed of at the District Landfill in Taumarunui. The table below provides information on the location and status of Ohura Ward Transfer Stations.

<b>Transfer Station</b>	<b>Location</b>	<b>Area</b>	<b>Status</b>
Waimiha	Cnr of Poro-O-Tarau and Waimiha Valley Roads	0.0400	This land is road reserve.
Matiere	Ngarukehu Street	0.0100	This land is road reserve adjacent to the old Matiere Landfill.
Ongarue	Intersection of Ongarue Waimiha Road and Ongarue Village Road	0.500	This land is road reserve.
Ohura	Taranui Street	0.720	This land is a rubbish dump reserve

Table 6: Ohura Ward Transfer Station Description

**4.5.2 Demand Projections****(a) Ohura Transfer Station**

The Ohura Prison is the main user of the Ohura Transfer Station, however this establishment is indicating an uncertain future in Ohura with the Ministry of Corrections unable to confirm the presence of the prison in Ohura in the future.

The Ohura Transfer Station is built on refuse reserve land, with storage capacity for all recyclables including the bulk items of timber, whiteware, and green waste. The site has additional land available, which could be utilised to provide additional capacity or storage if required.

**(b) Matiere Transfer Station**

The Matiere Transfer Station is small and does not have the capacity to allow the bulky recyclables to be deposited within the area. It is the smallest transfer station in the District.

The site has capacity to accept the refuse and recyclables that are currently permitted at this site. However, there is a relatively high level of illegal dumping, which can affect the capacity and inhibit legitimate use of this site. This includes many recyclables such as fencing wire, whiteware, and some green waste.

**(c) Waimiha Transfer Station**

The Waimiha Transfer Station is situated out of the township and predominantly services the local community, which is forestry and agriculture based. This would suggest that the population is relatively stable. There is adequate capacity for a basic level of refuse and recycling. Occasional dumping occurs.

**(d) Ongarue Transfer Station**

The Ongarue Transfer Station offers basic recycling and refuse disposal although other recyclables not permitted at this site are regularly deposited. The Ongarue Transfer Station services a community that is predominantly agriculture and forestry based. This would suggest that the population is relatively stable. The Ongarue site is a relatively large area and has adequate capacity to accept all anticipated refuse. This site is also large enough to also hold refuse from the Waimiha site.

**4.5.3 Risk Assessment**

A generic risk assessment has been carried out on rural transfer stations serviced with skip bins. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile 1 of 5 or higher have been addressed in this Assessment.

Two issues have been identified as being potential high risks to rural transfer stations being

- Hazardous waste, and
- Unconforming material being deposited at uncontrolled transfer stations.

These issues raise concerns in regards to capacity, health and safety, breach of legislation and potential odours beyond the property boundary. All of the sites in the Ohura Ward are open to the public 24 hours per day with unrestricted access. There is no control over the material deposited within the site and the risks of hazardous waste entering the site are high. It has been through the diligence of the contractor and Council staff that an environmental incident has been avoided. There is also a significant potential risk that a member of the public may come into contact with hazardous wastes before staff have checked the site.

The Ohura transfer station has large deposits of organic waste from the prison facility that attracts large numbers of wasps and native bees in the summer. Discussions are ongoing with the prison to reduce the amount of organic waste.

Further information on this risk assessment process is provided as Appendix 1.

#### **4.5.4 Options to Address Future Demand, Public Health, And Environmental Issues**

The issues of the disposal of hazardous wastes and unconforming refuse in unmanned transfer stations has the potential to have serious environmental and public health issues.

As all Ohura Ward sites are available to the public 24 hours per day it is possible that unconforming wastes and hazardous substances could be deposited at this site. The majority of Councils throughout the country have moved from unattended sites to reduce this risk, gain control over the waste stream and develop a fully user pays service. Ruapehu District Council is the only Council within the Manawatu – Wanganui Region that operates unattended transfer stations.

Options available to address these risks include:

- Status Quo with education campaigns to inform the public of the dangers of depositing hazardous wastes into the transfer stations,
- Staff the Transfer Stations and restrict public access,
- Close the Transfer Station.

#### **4.5.5 Preferred Council Response**

It is recommended that the options identified to reduce the potential risks from solid waste services are further investigated during the review of Council's Solid Waste Management Plan in 2005/2006, with implementation of any agreed changes in 2006/07

### **4.6 WATER SERVICES – OHURA TOWNSHIP**

#### **4.6.1 Water Supply**

##### **(a) Services Available in the Ohura Township**

##### **Background**

Council owns and operates a reticulated water supply scheme that supplies water to the residents of the Ohura Township.

The New Zealand railways established a water supply to the station area to supply the steam trains of the day. Over time many of the local population connected to and extended this supply. An upgraded reticulated water supply system, which included a pump station, and reservoir to supply the Ohura Township was commissioned in 1957. This was further upgraded in the sixties with the addition of a dosing plant, clarifier, and filter to provide treated water to the township.

### Water Source

Water is extracted from the Mangaparare Stream immediately upstream of the Taranui Road culvert, and then piped to the treatment plant in Hihi Street. Treated water is pumped to the reservoir site on the hillside above the intersection of Ohura Road and Huia Road. The pipeline delivering water to the reservoir also delivers water to the reticulation.

The reservoir has adequate capacity to meet the minimum reserve storage required for fire fighting under the Code of Practice for Fire Fighting Water Supplies. The design of the reservoir is deficient as it cannot be satisfactorily cleaned and is not vermin or bird proof.

### Quantity

The system's standby water storage is limited to what the reservoir can provide, which is estimated to be about 250m<sup>3</sup>. The average daily demand is approx 250m<sup>3</sup> so there is sufficient standby storage to meet one day of the daily demand. There has never been a need to ration or reduce water usage.

Although the capacity of the scheme is adequate to meet the current demand and also considered adequate to meet the future demand of the Township, the overall condition and performance of the asset are considered not satisfactory.

### Quality

The Ministry of Health last graded the supply in 1993 when it was given a Dc grading. The D grading for the water leaving the treatment plant reflects the fact that although full treatment is given, instrumentation provided is not adequate to demonstrate that the plant consistently produces water that complies with NZDWS: 2000. Other relevant factors that have influenced the grading are the lack of appropriate supervision given and the lack of continuous control. In the opinion of the Ministry of Health there is a high level of risk to consumers that they will become ill through drinking the water supplied.

The c grading given to the reticulation is satisfactory for small townships such as Ohura.

### **(b) Demand Projections**

The Ohura water supply system has adequate capacity for the population it currently serves. The township population has declined over the years and it is not considered that there will be any significant increase in the population during the period covered by this Assessment. Consequently it is not expected that the demand for reticulated water in the Ohura Township will increase.

### **(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks

that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in Ohura:

- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access).
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

The Ohura community are exposed to a level of risk of contracting a water borne disease from drinking water that does not comply with NZDWS: 2000.

**(d) Options to Address Future Demand And Public Health And Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Improve water treatment process,
- Secure water storage reservoir from vermin, birds and unauthorised access,
- Develop and implement public health risk management plans,
- Close treatment plant and install alternative water supplies within the township.

**(e) Recommended Council Response**

The financial viability of the Ohura reticulated water supply has been in question for a number of years. In light of the expected changes in water supply related legislation it is likely that the financial viability of this service for the Ohura community will be called further into question.

Council signalled to the community in the Future Ruapehu Long Term Plan 2004-2014 that in the event that the Ohura Prison is closed, Council will begin the procedure to exit this water scheme. This procedure involves:

- Making public the view of the Medical Officer of Health on the closing of the scheme, and
- Holding a binding referendum and gaining 75% support of the proposal.

**4.6.2 Sewerage**

**(a) Services Provided in the Ohura Township**

There is no Council operated sewage system in Ohura. Virtually all properties within the Ohura Township treat their household effluent (sewage) by means of individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

A small sewage treatment plant until recently collected and treated household effluent from properties situated around the prison on Tawa Street and Williams Ave and disposed of the treated effluent to the nearby Waitewhena River. This treatment plant was (and still is) operated by the Department of Corrections. In May 2003 raw sewage had to be discharged to the Waitewhena River due to stormwater infiltration through old pipework on private properties overloading the plant. In order to eliminate any similar events in the future, the Department of Corrections decided to disconnect 15 private properties from this system so that it now only serves the prison. This was carried out in May 2004 with all disconnected properties having to install individual septic tanks and soakage fields.

**(b) Future Demand**

The Township's population has declined over the years and is not expected to increase significantly over the period covered by this report. Consequently, apart from the development described above, it is not expected that there will be any significant increase in discharge of sewage effluent to ground.

**(c) Risk Assessment**

Data supplied by the Waikato District Health Board covering the period since 1999, indicates that there were 6 reported cases of communicable diseases from the Ohura area. The public health risk is considered negligible due to the relatively low population density of the area.

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. As has been stated above, there is no Council operated sewage scheme in Ohura, however from the risk assessment process which is provided in Appendix 1, the following issues with the system operated by the Department of Corrections were identified as being potential high risks:

- Unauthorised access to the treatment facility could result in serious injury or fatality,
- Breach of Resource Consent conditions could result in major environmental impacts and health concerns.

**(d) Options to Address Future Demand And Public Health And Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Upgrade current system to provide a reticulated network to Ohura,
- Undertake an education campaign on the importance of maintaining septic tanks.

**(e) Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, such as regular cleaning. Increased public

awareness will assist in reducing both the environmental and public health risk from the disposal of sewage to ground.

The New Zealand Water and Waste Association have recently produced a booklet titled 'The Story of Your Septic Tank' which gives a 'hands-on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet be provided to all properties that currently dispose of their wastewater through a septic tank system.

#### **4.6.3 Stormwater**

##### **(a) Services Provided to the Ohura Township**

There are a number of open and piped stormwater drains that convey stormwater through and away from the Ohura Township and discharge into the Mangaroa River and Waitewhena and Mangaparare Streams. These drains have received minimal maintenance by Council in the past but increased maintenance in recent years has improved drainage in the township to some extent.

Maps produced by Horizons Regional Council show that the estimated flood level in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) would inundate most of the lower lying areas of the township as has been evident in previous flood events experienced in Ohura in the past.

##### **(b) Future Demand**

Apart from continued maintenance of the stormwater network, it is considered that the existing network is adequate for the discharge of stormwater from the township under normal circumstances and demand will not increase to any extent.

##### **(c) Risk Assessment**

A generic risk assessment has been carried out for stormwater disposal systems. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. There were no issues identified in this category for the stormwater system in Ohura.

Although analysis has not highlighted any significant risks in relation to the stormwater service provision in Ohura, a number of the township's residents do not consider that the current system of open drains and culverts is acceptable. Council does not consider that these open drains and culverts present a significant public health or environmental risk.

##### **(d) Options to Address Future Demand, Public Health, and Environmental Issues**

Although risk analysis has not highlighted any significant risks in relation to this service, the following options have been developed to address publicly perceived risks with this service:

- Increased or improved maintenance of open drains or,

- Piping of all open drains,
- Status quo.

**(e) Preferred Council Response**

As the current Ohura stormwater network provides no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

**4.7 WATER SERVICES - RURAL SETTLEMENTS/RURAL SCHOOLS**

**4.7.1 Water Supply**

**(a) Service Provided in Rural Settlements**

There are a number of rural settlements within the Ohura Ward, namely Matiere, Ongarue and Waimiha, which have water supplies, operated and maintained by the respective local communities.

Sources

Water for these community supplies is obtained from either springs or rainwater collected off building's roofs or a combination of the two. These sources are not graded by the Ministry of Health and do not receive any form of treatment prior to distribution, apart for the Ongarue School which filters the spring water prior to disinfection by means of ultra violet (UV) irradiation.

Quantity

The flows from the various springs are ungauged but anecdotal evidence suggests that the sources are sufficient to supply the schools and dwellings relying on this form of supply.

Quality

The sources of water supply are ungraded by the Ministry of Health however the schools in these rural settlements take water samples, which are tested, at an accredited laboratory. From the draft Annual Report of Drinking Water Quality 2003 produced by the Ministry of Health, none of the schools achieved bacteriological or protozoan compliance. Although water obtained from these sources may be considered to be potable, it is evident that the sources do not achieve compliance with the New Zealand Drinking Water Standards 2000. (NZDWS:2000).

**(b) Service Provided in Rural Schools**

There are three rural schools within the Ohura Ward situated in isolated locations away from any other significant communities. These schools are located at Kirikau, Otunui, and Tokirima and cater for between 8 and 14 pupils.

### Source

According to the *2003 Edition of the Register of Community Drinking Water Supplies in New Zealand*, the Kirikau School is supplied from the Kirikau School Spring, whilst the Otunui and Tokirima Schools use rainwater collected off the school building's roofs for their water supplies. In addition Tokirima School pumps water from a nearby creek for the flushing of toilets.

### Quantity

The flow from the Kirikau School spring is ungauged but is reported as being sufficient to supply the school's needs. The roof water supplies for the Otunui and Tokirima Schools is also reported as being sufficient for their needs, although Tokirima School indicated that the water supply had to be supplemented with tankered water during a previous dry period. Otunui School have a back-up supply from an adjacent farm.

### Quality

These sources are ungraded by the Ministry of Health and are untreated prior to distribution, apart from Tokirima School, which has filtered water from the rainwater tank for drinking purposes. From data supplied by the Waikato District Health Board covering the period since 1999, there have been no reported cases of communicable diseases from the areas serviced by these rural schools.

The schools take water samples, which are tested, at an accredited laboratory. However from the draft Annual Review of Drinking Water Quality produced by the Ministry of Health for 2003, none of the schools achieved bacteriological or protozoan compliance for the 2003 year. Although water obtained from these sources may be considered to be potable, it is evident that the sources do not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS:2000).

### **(c) Future Demand**

The populations of these various rural settlements are not known exactly, but they are considered to have remained reasonably stable over previous years and are not expected to increase to any extent over the period covered by this report. Consequently it is not expected that there will be any greater demands placed on the water supplies during the period, assuming the springs are able to continue to provide consistent flows as has been experienced to date.

Based on a stable surrounding population it is assumed that the school rolls will not increase significantly, therefore their water supplies should be adequate for future requirements. Tokirima School should consider increasing the rainwater storage capacity to reduce the possibility of future shortages due to drought conditions

### **(c) Risk Assessment**

A generic risk assessment has been carried out for small water schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks

that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the rural settlements and schools:

- Contamination of the water supply at the source i.e. spring, roof or stream,
- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access),
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

The rural settlement communities are considered to potentially be at risk to contracting water borne diseases from drinking untreated water.

#### **(d) Options to Address Future Demand, Public Health, And Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement,
- Undertake an education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

#### **(e) Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of water borne diseases and methods to eliminate these risks, such as boiling all drinking water, filtration, and regular storage tank cleaning and maintenance.

The New Zealand Water and Waste Association have recently produced a booklet titled 'The Story of Drinking Water' which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that this booklet is provided to all properties that currently source and provide their own water supply.

### **4.7.2 Sewerage**

#### **(a) Services Provided in Rural Settlements**

There are no Council operated sewage systems in the rural settlements of Matiere, Ongarue, or Waimiha or in the rural schools. Sewage from the various dwellings, schools, clubs, marae etc is treated by individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

**(b) Future Demand**

The population of these rural settlements is not expected to increase significantly over the period covered by this report and consequently it is not expected that there will be any significant increase in discharge of sewage effluent to ground.

**(c) Risk Assessment**

Data supplied by the Waikato District Health Board covering the period since 1999, indicates that there were 6 reported cases of communicable diseases from the Ohura area. The public health risk is considered negligible due to the relatively low population density of the area.

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From this risk assessment, there were no issues identified for the on-site treatment and disposal of sewage, which attracted a profile of 6 or higher.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement,
- Undertake an education campaign on the importance of maintaining septic tanks.

**(e) Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, such as regular cleaning. Increased public awareness will assist in reducing both the environmental and public health risk from the disposal of sewage to ground.

The New Zealand Water and Waste have recently produced a booklet titled 'The Story of Your Septic Tank' which gives a 'hands-on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet is provided to all properties that currently dispose of their wastewater through a septic tank system.

**4.7.3 Stormwater****(a) Services Provided in Rural Settlements**

The stormwater systems within the various rural settlements vary from open stormwater drains and culverts under roads that have been constructed in the past to convey stormwater through the settlement of Matiere and discharge into the Ohura Stream, to roadside drains and informal systems which convey stormwater via natural overland flow paths to adjacent creeks or waterways

such as in Ongarue and Waimiha. These systems have received minimal maintenance by Council over the years.

Maps produced by Horizons Regional Council show that the estimated flood level in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) would inundate the lower levels of the Matiere Township adjacent to the Ohura Stream but Ongarue and Waimiha would be relatively unaffected.

There are no formal stormwater discharge systems at the rural schools. Stormwater from the Kirikau School building roof and adjacent surfaced areas is discharged to ground via natural run-off patterns to a natural watercourse at the rear of the school. Roof water from the Otunui and Tokirima schools is collected in storage tanks and any surface stormwater is discharged via natural overland flow paths to adjacent creeks or waterways. The Tokirima School was damaged by floodwaters in the floods of 1998 and has been rebuilt on elevated piles, presumably above the expected flood level. The ground surrounding this school is not free draining and tends to accumulate ponded water

**(b) Future Demand**

Apart from continued or improved periodic maintenance, it is not expected that the existing stormwater network within these rural communities will be expanded to any extent.

**(c) Risk Assessment**

A generic risk assessment has been carried out for stormwater disposal systems. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. There were no issues identified in this category for the stormwater system in Ohura rural settlements. It is not considered that the current stormwater collection and disposal systems within the rural settlements present a significant public health risk.

**(d) Options to Address Future Demand and Environment and Public Health Issues**

Whilst the above risk analysis has not highlighted any significant risks improvements to the scheme would further reduce any possible risk to the environment and public health. Options identified for the future of this service include:

- Increased or improved maintenance of open drains,
- Piping of all open drains,
- Status quo.

**(e) Preferred Council Response**

As the current rural settlement stormwater network provides no significant risks to public health or the environment and it is not considered that the

demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

## **4.8 WATER SERVICES – MARAE**

### **4.8.1 Services Provided to Marae**

There are 7 marae spread throughout the Ohura Ward, marae recorded in the 2001 census are listed in Appendix 4. Council does not currently have any information relating to the provision of Water Services to these marae.

#### **(a) Water Supply**

It is assumed that as these marae are in rural areas, water is obtained from nearby springs, bores or collected off roofs of marae buildings and stored in tanks on site.

#### **(b) Sewerage**

It is also assumed that sewage is disposed of by means of on-site septic tanks and effluent disposal to ground by means of soakage fields.

#### **(c) Stormwater**

It is envisaged that stormwater from the marae building roofs and surfaced areas would be discharged to ground via natural run-off patterns where no formal stormwater discharge system exists.

### **4.8.2 Future Demand**

Due to their very nature, there will always be a fluctuating demand placed on the water services for marae. There may be periods where there is little or no activity on a marae, and other times where the water supply and sewage disposal systems may be under considerable 'load'. The capability of the relative systems' ability to cope under these circumstances will depend on their original design and construction and how they have been developed and maintained over time.

### **4.8.3 Risk Assessment**

It is considered that water services associated with rural marae could potentially present a significant public health risk due to the ability (or lack thereof) at times to supply large groups of people with untreated drinking water which may have been stored for some time and could be at risk to being contaminated, as well as sewage systems that may not be able to cope with peak loadings.

### **4.8.4 Options To Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement,

- Undertake an education campaign on the importance of maintaining septic tanks,
- Undertake an education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

#### **4.8.5 Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, and increase public awareness of water borne diseases and methods to eliminate these risks. Increased public awareness will assist in reducing both the environmental and public health risks from these services.

The New Zealand Water and Waste Association have recently produced two booklets titled 'The Story of Your Septic Tank' which gives a 'hands-on' approach to the operation, care, and maintenance of septic tanks, and 'The Story of Drinking Water', which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that these booklets are provided to all marae that currently dispose of their wastewater through a septic tank system and/or source and provide their own water supply.

## 5.0 TAUMARUNUI

### 5.1 INTRODUCTION

5.1.1 The Taumarunui Ward is the largest Ward of the Ruapehu District by population, and the smallest Ward by land area.

5.1.2 Key Statistics for the Taumarunui Ward are provided in the following table.

Taumarunui Ward - Key Statistics	
Population	6435
Area	598km <sup>2</sup>
Number of water supply connections	2,422
Number of properties on metered water supply	182
Number of rateable properties	3,256
Main industry	Sales and service industry
Possible growth industries	Agriculture, hospitality, tourism
Rural Settlements	Kakahi, Manunui, Piriaka, Taumarunui Township
Number of Schools	8

Table 7 Taumarunui Ward – Key Statistics

### 5.2 SETTLEMENTS

#### 5.2.1 Taumarunui Township

There are four settlements in the Taumarunui Ward. The largest of these settlements is the Taumarunui Township. Taumarunui is a large township located on State Highway 4. The census usually resident population for the Taumarunui Township was 5,136 in 2001, which is a reduction of 696 (-12%) since the 1996 census was undertaken. The median income of people in Taumarunui is \$13,900, compared with \$16,700 for the Ruapehu District and \$18,500 for all of New Zealand.

The North Island Main Trunk Railway Line and State Highway 4 both run through the centre of town. The Township is situated at the confluence of the Ongarue and Wanganui rivers, the latter being a recreation attraction to local residents and visitors.

#### 5.2.2 Rural Settlements

There are three other rural settlements in the Taumarunui Ward. These are Piriaka, Manunui and Kakahi. These settlements have primarily developed as service centres to the local agricultural, timber and horticultural industries.

## 5.3 CEMETERIES

### 5.3.1 Services Within The Taumarunui Ward

#### (a) Urupa (Maori Tribal Cemeteries)

From the information available it is known that there are fourteen Urupa in the Taumarunui Ward.

#### (b) Cemeteries

There are three cemeteries in the Taumarunui Ward; Taumarunui Old Cemetery, Taumarunui New Cemetery and Manunui Cemetery

Taumarunui Old Cemetery is located in Golf Road. This cemetery has not been formally closed but there will be no further burials in the cemetery and formal closure procedures will be undertaken at sometime in the future.

Taumarunui New Cemetery is also located in Golf Road. The cemetery is divided into two levels by topography. The lower level and part of the upper level have open burial rows. The majority of the upper level including the RSA section have concrete berms where the dimensions of the monuments erected are limited. The total area of this cemetery is 4.67 hectares. Currently burials number approximately 40 per annum. Current capacity of this cemetery based on present burials is 100 years.

Manunui Cemetery is located on State Highway 4 just north of Mahoe. This cemetery is all one level. Approximately two thirds of the developed cemetery is open rows with one-third concrete berms. Total land area is 1.71 Hectares. Current burials number approximately 12 per annum. Current capacity based on present burials is 200 years.

Cemetery	Location	Area (ha)	Current and Estimated Future Burials / Year	Estimated Life (years)
Manunui	State Highway 4 Manunui	1.7149	12	200
Taumarunui (New)	Golf Road Taumarunui	4.6705	38	100
Taumarunui (Old)	Golf Road Taumarunui	1.9501	0	0

Table 8: Taumarunui Ward Cemeteries

### 5.3.2 Demand Projections

The number of burials per annum is expected to increase slightly in both cemeteries over the next twenty-year period as the aged population increases. However this may be offset by the predicted slight decline in the population of the Taumarunui Ward over the same period. There is ample capacity to meet a substantial increase in demand in the event predictions are inaccurate.

### **5.3.3 Risk Assessment**

A risk assessment has been carried out on the cemetery services provided within the Taumarunui Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Taumarunui Cemetery services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

### **5.3.4 Options to Address Future Demand, Public Health, and Environmental Issues**

There are no known public health or environmental issues with the provision of cemeteries in Taumarunui. When the capacity of Taumarunui Cemetery (new) capacity has reduced to 20 years, it will be necessary for Council to consider allocating and re-classifying some of its surplus reserve land for cemetery purpose. There are a number of green space reserves in Taumarunui vested in Council that could be considered for cemetery development.

## **5.4 PUBLIC TOILETS**

### **5.4.1 Services Within the Taumarunui Ward**

There are a total of 5 public toilet facilities in the Taumarunui Ward.

There are two public toilet facilities in Hakiaha Street, Taumarunui. Both facilities are connected to sewer mains. The main public toilet block, located beside the town square. Table 8 illustrates the units available for public use within the building. Both male and female units include a disabled toilet stall. This facility is cleaned twice daily and provides female sanitary disposal units, electric hand dryers, and automatic air freshener units. With the exception of the single multi sex disabled unit, the facility is open 365 days per year, 24 hours per day. The multi sex unit is reserved as a facility that can be opened during the time that either of the main units is closed to the public for any reason eg overflowing pans due to blockage. There is high use of the facility all year and very high use, particularly in weekends and school holidays during the winter ski season.

The second facility is the toilets in the Railway Station building. This is a Tranz Scenic facility, available principally for the use of Tranz Scenic rail and bus passengers but is also used by the general public who are aware of the location of this facility. The facility is cleaned and generally maintained by Tranz Scenic. The cleaning rotation is unknown. Council receives numerous complaints regarding the state and cleanliness of the facility.

There are a further three public toilet facilities located in Taumarunui recreation reserves. These are located in Cherry Grove Reserve, at the end of Cherry Grove Road, Taumarunui Domain, Turaki Street, and Manunui River Reserve beside the Taumarunui Camping Ground off State Highway 4.

The Cherry Grove toilets are connected to a septic tank. Taumarunui domain and Manunui River Reserve toilets are both connected to sewer mains. The facilities have varied use eg the Cherry Grove facility has higher use in summer than winter and the Taumarunui Domain has higher use in winter than summer. The travelling visitor does not generally use these facilities although Cherry Grove has high summer use by canoeists using the location as a launch site for Whanganui river trips. Cherry Grove is also a popular picnic area and the toilet facility has frequent use by local residents. The river reserve toilets at Manunui are used principally in the summer months by swimmers and picnickers in the area and it is probably also used by people walking on the Manunui River Reserve Walking Track.

The location of the facility on Taumarunui Domain is poor in relation to the location of the playground area. A new skate park is being built in the Domain and it is anticipated that there will be increased demand for a public toilet facility closer to the children's play area.

In addition to the above described council operated and maintained public toilet facilities, there are also toilet facilities available to the public patronising the three petrol stations in Taumarunui, one of which is open 24 hours a day. A number of cafes and restaurants in Taumarunui and Manunui also provide facilities for their customers.

#### **5.4.2 Demand Projections**

The closest public toilets to Taumarunui are Ohura, Te Kuiti, Turangi, Ohakune, or National Park. The National Park toilets comprise of one men's and one women's cubicle and are located off the State Highway. These facilities are not likely to be used by buses. National Park is located 30 minutes south, each of the other locations are approximately one hour or further from Taumarunui. For this reason the public toilet facilities in Taumarunui (particularly those facilities located in Hakiaha Street) experience high levels of usage. This usage is predicted to increase as Tourist visitor numbers to the Ruapehu increase.

#### **5.4.3 Risk Assessment**

A risk assessment has been carried out on the public toilet service provided within the Taumarunui Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Taumarunui public toilet services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

#### **5.4.4 Options to Address Future Demand, Public Health, and Environmental Issues**

The demand for public toilets suitable for bus travellers is likely to increase if tourism in the Region increases. This increase in demand may result in a need to consider the installation of a second Council facility on a site that has sufficient parking area for tourist buses, possibly located at either the entrance or exit of Taumarunui. The current Hakiaha Street facility has very

limited parking in business hours. The Council owns or administers sufficient land or road reserve at both entrances to Taumarunui to construct a new facility.

There is known to be inappropriate use of the Hakiaha Street public toilets from time to time, which is most likely to be due to cultural differences from some of the travelling public, although deliberate abuse also occurs. Signs demonstrating the correct use of the toilet bowls are being located at the facility. Council usually receives complaints about misuse in short time frames and extra cleaning is undertaken immediately. It is unlikely that the toilets are used in an unclean state, thus unlikely that any health issue would arise from this issue.

Blockage of the toilets from vandalism does result in overflowing bowls from time to time. The public generally notify Council very quickly in these occurrences and unblocking and cleaning takes place as an immediate response. If necessary, the facility is closed while this process takes place.

A possible environmental issue arising from the provision of public toilet facilities is the possible overflowing of septic tanks if these are not cleaned on a regular basis. In order to prevent this from occurring Council programmes regular cleaning cycles of public toilet septic tanks.

## **5.5 SOLID WASTE**

### **5.5.1 Services within the Taumarunui Ward**

#### **(a) Kerbside Collection**

Council provides a kerbside refuse collection services to urban centres within the Taumarunui Ward including Taumarunui Township, Manunui, Mahoe and Piriaka on Thursdays.

#### **(b) Transfer Stations**

Two transfer stations service the Taumarunui Ward; Taumarunui, and Kakahi. The Taumarunui Transfer Station has been developed at the front of the District landfill, providing opportunity for members of the public to recycle before refuse is deposited into the landfill. This site is attended and open on weekdays from 10.00am to 5.30 pm (6.00pm daylight saving hours) and weekends 9.00am to 5.30 pm (6.00 daylight saving hours). The site accepts the bulk material for recycling, green waste, and residential quantities of hazardous materials.

The Kakahi community has a small, unattended rural transfer station situated on Council owned road reserve off Watiea Road. This Transfer Station provides basic recycling facilities but is subject to regular abuse with bulk recyclables and hazardous material being dumped outside the locked gates.

The table below provides information on the location and status of Taumarunui Ward Transfer Stations.

<b>Transfer Station</b>	<b>Location</b>	<b>Area</b>	<b>Status</b>
Taumarunui	Golf Road, Taumarunui	NA	This is situated on the current landfill site.
Kakahi	Waitea Branch Road	0.350	This land is road reserve.

Table 9: Taumarunui Ward Transfer Station Description

**(c) Recycling Centre**

The recycling centre is located at the between New World and BP Service Station in Taumarunui Township, providing 24 hour access to basic recycling facilities to the general public.

**(d) District Landfill**

The District landfill is situated at Taumarunui, on the same site as the Taumarunui Transfer Station. This is a historic site and has been receiving night soil since the 1900's. The historic records of disposal are not in depth. However a map of the site was developed in 1994 when the first resource consent for the landfill was issued.

This site has a resource consent for refuse disposal, which will expire in 2020. Reclamation work of the area has continued and capping of old exposed areas has been ongoing. The landfill is unlined; with no leachate or gas capture occurring onsite. An attempt has been made to capture the potentially contaminated stormwater from the site and treat it through a series of stormwater ponds. There is potential for a breakout of leachate from such an undefined landfill and mitigation measures need to be considered to control this possibility.

Final contour heights have been established for the site however; staged planning to reach these heights has not been undertaken. Significant air space saving can be made in the planned filling of cells within the landfill. Planned filling provides a good guideline to the compaction achieved onsite and rate of cell development required.

Earthtech Engineering Limited has provided a plan to develop the current cell and subsequent cells for the next three to four year period. This will cover the period of the current contract. After 2006, the landfill quantities are predicted to be very low and during the review of the Solid Waste Management Plan (SWAMP) in 2005/06, the operation of this site needs to be reviewed.

All new landfills must be lined, and leachate and gas capture systems installed as they are constructed. The Ministry for the Environment (MFE) has taken a keen interest in landfills and the review of all landfill resource consents. There may be increasing pressure to upgrade the landfill in the future. Monitoring of leachate, stormwater, and gas may result in the need to upgrade the landfill to ensure consents are complied with. The MFE guidelines give the Taumarunui landfill a B class rating. This is due to the fact that it does not have a liner. The MFE have indicated that they wish to see this type of landfill closed by 2010.

The landfill site has a connection for drinking water, but no sewage reticulation, and single-phase power to the buildings. Limited power supply reduces the potential utilisation of machines such as presses and bailer for further recycling. Sewage is captured by a septic tank system on site and tankered off site by Taumarunui Plumbing.

The table below outlines the current resource consents issued by Horizon's Regional Council for the operation of this Landfill. The landfill is monitored by United Water to ensure compliance with resource consent conditions.

Operating Landfill Consents		Expiry Date
Discharge Permit 1011186	Granted consent to discharge refuse onto and into land.	30 June 2020
Discharge Permit 101185	Applied consent to discharge direct stormwater runoff from land in and around the landfill.	30 June 2035
Discharge Permit 101187	Applied consent to discharge landfill gas, dust, and odour to air.	30 June 2035
Discharge Permit 101188	Applied consent to discharge leachate and stormwater runoff into the ground water on and into the river.	30 June 2035

Table 10: District Landfill Resource Consents

This landfill accepts residential, commercial, and industrial refuse, providing that the refuse meets the acceptance criteria.

The table below provides information on the location and status of the District landfill.

Asset	Location	Area	Status
District Landfill	Golf Road, Taumarunui	14.841	This site was gazetted as a sanitary reserve in 1909 and it is believed land filling commenced around that time as a night soil disposal area in the river terrace. Land filling activities transferred to the upper terrace around 1980. The Ruapehu District Council currently owns the site.

Table 11: District Landfill Description

### 5.5.2 Demand Projections

The use of the BP Service Station Recycling Centre continues to rise with public acceptance of recycling in urban areas. It is projected that demand for this site will shortly exceed capacity and that either additional sites within the Township or additional recycling containers at the current site, will need to be added to reduce the pressure on the current site. This site is currently serviced twice per day by landfill staff, and once per week by the contractor, for all recyclables except glass, which is serviced more frequently. As

capacity is an issue at this site the service frequency has been increased to ensure capacity is maintained. There is limited ability to further increase services at this site and other options need to be considered.

The Township of Manunui has no recycling station, reducing these residents' opportunities to recycle. This is reflected in observations of greater volumes of recyclables appearing in their refuse bags against other areas of the town.

The Taumarunui Transfer Station is expected to be adequate for the volumes of materials deposited by the public. This site is also used as a storage area for other recyclables from other transfer stations. These recyclables are then transported to market or on for further processing at the contractors site. A purpose built recycling facility would further enhance the pleasure of recycling at this site.

Green waste mulching is occurring onsite at the Taumarunui Transfer Station and there is an increasing demand for the material to be further recycled to compost for sale to the public. If this activity is to be undertaken it will require a resource consent.

The refuse volumes entering the landfill, measured at the site are reducing in line with the waste minimisation programme. This will ensure that landfill capacity aligns with the consented life of the landfill.

### **5.5.3 Risk Assessment**

A generic risk assessment has been carried out on rural transfer stations serviced with skip bins (i.e. Kakahi Transfer Station). A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment.

#### **(a) Rural Transfer Stations**

Two issues have been identified as being potential high risks to rural transfer stations, being:

- Hazardous Waste, and
- Unconforming material being deposited at uncontrolled transfer stations.

These issues raise concerns in regards to capacity, health and safety, breach of legislation and potential odours beyond the property boundary. The Kakahi site in the Taumarunui Ward is open to the public 24 hours per day with unrestricted access. There is no control over the material deposited within the site and the risks of hazardous waste entering the site are high. The site is commonly abused with bulk items being deposited at the site, and occasionally hazardous materials, such as oils and agricultural sprays. It has been through diligence of the contractor and Council staff that an environmental incident has been avoided.

Further information on this risk assessment process is provided as Appendix 1, section 6.3.

**(b) Attended Transfer Stations**

The risks associated with attended transfer station are significantly lower than unattended transfer stations due to the close scrutiny that staff can pay to refuse and recyclables entering the site.

**(c) District Landfill**

The District landfill is unlined and leachate can feely enter the groundwater system, eventually entering the river. No gas is collected from the landfill. The general public are being excluded from the landfill itself, which will reduce the risk of the public entering potential high risk zones of exposed refuse. The MFE undertook a risk assessment of the District Landfill in 2000. The results of this assessment can be found in Appendix 1. All identified operational comments have been addressed.

**5.5.4 Options to Address Future Demand, Public Health, and Environmental Issues**

**(a) District Landfill**

There is adequate capacity in the landfill to last the life of the resource consent, providing volumes continue on the current downward trend. There may be increasing demand from outside of the District to deposit refuse in the District landfill as other Council's close their landfills.

Options available to address identified concerns include:

- Investigate mechanism to control any contaminants entering the river,
- Investigate leachate collection via cut off drains and re-irrigation across the site or through the fitting of a clay liner over old refuse,
- Continue vegetation control works to enable the full site to be assessed,
- Investigate adding a liner on top of the old landfill,
- Close the District landfill and deposit refuse at another site (out of District).

The issues of the disposal of hazardous wastes and unconfirming refuse in unmanned transfer stations has the potential to have serious environmental and public health issues.

**(b) Rural Transfer Stations**

As the Kakahi site is available to the public 24 hours per day, it is possible that unconfirming wastes and hazardous substances could be deposited at this site. The majority of Council's throughout the country have moved from unattended sites to reduce this risk, gain control over the waste stream and develop a fully user pays service. Ruapehu District Council is the only Council within the Manawatu – Wanganui Region that operates unattended transfer stations.

Options available to address the risks associated with rural transfer stations include:

- Status Quo education campaigns to inform the public of the dangers of depositing hazardous wastes into the transfer stations,
- Staff the Transfer Stations and restrict public access,
- Close the Transfer Station.

#### **5.5.5 Recommended Council Response**

It is recommended that the options identified to reduce the potential risks from solid waste services be further investigated during the review of Council's Solid Waste Management Plan in 2005/2006, with implementation of any agreed changes in 2006/07

### **5.6 WATER SERVICES – TAUMARUNUI TOWNSHIP**

#### **5.6.1 Water Supply**

##### **(a) Services Within the Taumarunui Township**

Water for the township of Taumarunui is produced at the Matapuna water treatment plant that draws water from the Whanganui River approximately 200m upstream of the road bridge at the eastern end of Taumarunui. Raw water is pumped from the river by variable speed pumps into the nearby treatment plant. Treatment is as follows: -

- Medium aperture size screening,
- Coagulant addition at a pipe bend outside the intake pump station,
- Polyelectrolyte addition at the base of the flash mix tower,
- Sedimentation through four hopper bottomed up flow clarifiers,
- Filtration through three vertical multimedia gravity filters,
- Addition of soda ash, fluoride, and chlorine, then
- Discharge into a clear well situated under the clarifiers.

High lift pumps take water from the clear water well and deliver it to the Matapuna reservoir located approximately 60m above the plant on an adjacent hill. Water is then distributed from the reservoir to consumers and the Rangaroa, Manunui, Te Peka, and Sunshine reservoirs. Booster pumps at the corner of Miro Street and SH4, at Sunshine, and in Kururau Road maintain pressures in the network, and also assist with the delivery of water to the Manunui, Sunshine, and the Te Peka reservoirs.

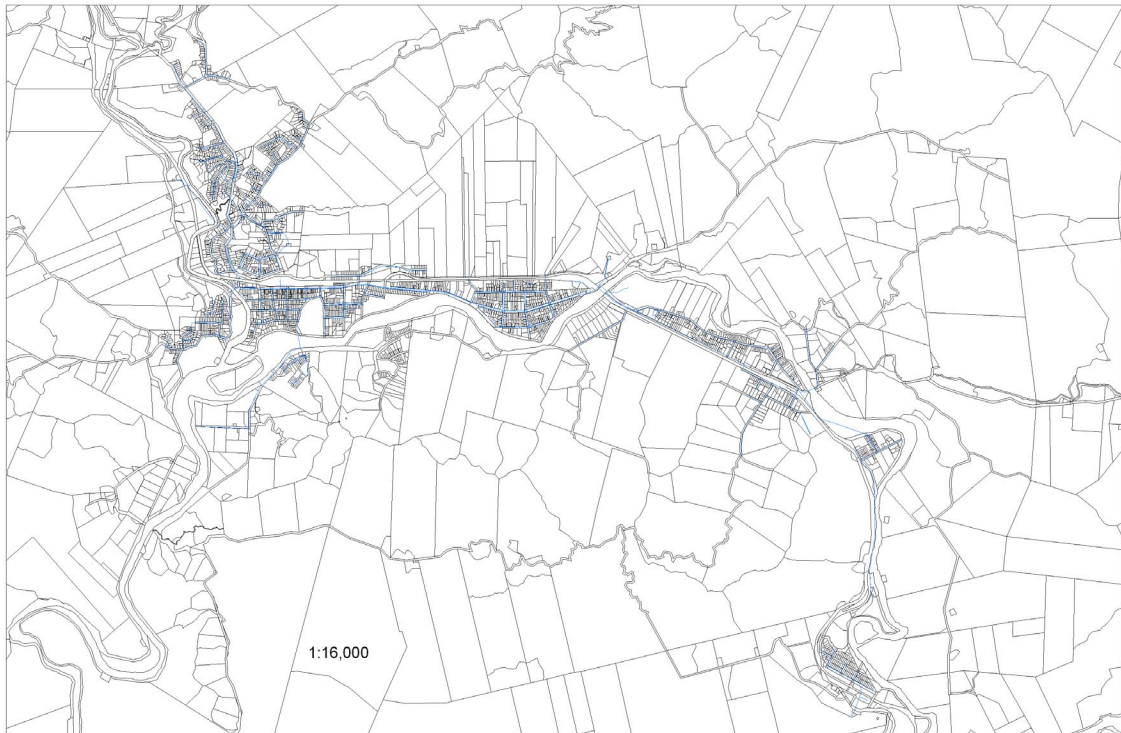


Figure 1: Taumarunui Infrastructure

### Water Quantity

The amount of water that can be taken from the Whanganui River is set at 7,000m<sup>3</sup>/day. This equates to 0.8% of the summer low flow.

The current average daily demand for water is about 3,000m<sup>3</sup> a day, and as total amount of water that can be stored is 8,984m<sup>3</sup>, this represents almost 3 days of normal use. This is considerably more than the minimum one-day storage required to provide the target levels of service and meet Ministry of Health guidelines.

The reticulation pressure within Taumarunui can be considered as satisfactory. The majority of Taumarunui receives pressures in excess of 500kPa. Lowest pressure within Taumarunui is at the geographically elevated regions of Sunshine and Te Peka. When tested as part of 2003 condition assessment however, pressures at these areas exceeded the 250 kPa required under Department of Health's "Water Supply Grading 1993".

New Zealand Fire Services have reported deficiency in fire flows in Huia Street and Ward Street.

### Water Quality

The Ministry of Health last graded the Taumarunui water supply in 1993. The grading is in two parts. The first grading relates to the water as it is leaving the treatment plant before it enters the reticulation system, and is concerned with the barriers guarding against contaminated water. The 'A' grading achieved by the Matapuna treatment plant means that this part of the system is completely satisfactory, and there is a very low level of risk that consumers will become ill through ingesting faecal coliforms, giardia, or cryptosporidium.

The second grading covers the reticulation, which was 'd'. This also reflects the situation, as it existed in 1993, which according to the Ministry of Health was unsatisfactory and presented a high level of risk to consumers at that time. However since this grading was done, a large part of the reticulation has been replaced and this combined with other changes in operation, maintenance and testing procedures should see this raised to at least a 'b' grading when the next survey is done by the Ministry of Health.

Occasionally water quality in the distribution system is affected by the inefficient operation of Rangaroa service reservoir. This is being addressed in the development programme.

**(b) Future Demand**

The normally resident population of Taumarunui is around 5,100 persons. The population has been reasonably stable over previous years and is not expected to increase to any extent over the period covered by this report consequently it is not expected that there will be any greater demand for water supply during this period. There is ample treatment, storage and supply capacity throughout the water supply system.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A qualitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in Taumarunui:

- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access), and
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Secure water storage reservoir from vermin, birds and unauthorised access,
- Develop and implement Public Health Risk Management Plans,
- Implement programme to install back flow preventers.

**(e) Preferred Council Option**

It is recommended that Council ensure that all aspects of the Taumarunui water supply system are protected from potential contamination and that steps are taken to ensure that the best possible gradings are able to be

achieved for both the treatment process and distribution system when reviewed by the Ministry of Health.

### **5.6.2 Sewerage**

#### **(a) Services Provided in the Taumarunui Township**

Taumarunui has had a reticulated sewage disposal and treatment scheme since the mid 1920's, at which time it comprised of a limited reticulation and three septic tanks that discharged settled effluent direct to adjacent waterways. The tanks serviced the central business area, Rangaroa, and the Sunshine railway settlement.

In 1965-1966 a comprehensive sewage scheme was implemented. A primary treatment plant designed for a population of 8000 was constructed at Hikumutu, and the three septic tanks were by-passed by a trunk sewer, which conveyed all wastes to the new treatment plant. Three pumping stations were constructed, in Huia Street, opposite the Tuku Street Domain, and at Victory Bridge. As part of the same scheme, the reticulation of Matapuna and construction of a trunk sewer to link into the main system at Victory Bridge was undertaken.

Further reticulation works were carried out between 1972 and 1975 that saw the Hospital Hill, Lairdvale, and parts of Tarrangower connected to the system. Another major extension of the reticulation into Manunui was completed in 1990.

Around this time it became apparent that the treatment plant was in need of renewal. The reason for this was that the plant could no longer produce effluent that met the more stringent standards being required by those using the river, conservationists, and local Iwi. The plant was also showing signs of deterioration, and was becoming overloaded with the connection of the Manunui residents. The outcome was that the existing treatment plant was built and commissioned in October 1993.

The most recent development of the system was completed in March 1997 that saw the reticulation extended into that part of Tarrangower between Campbell Street and Manson Street, and into Hall Crescent and Manson Street early in 2001.

There are still a number of areas that are serviced by privately owned septic tanks, these being that part of Golf Road beyond the High School, Taringamotu Road, Simmons Road, Hikumutu Road, and the top end of Lairdvale Road.

The reticulation consists of approximately 46,950 metres of gravity main, varying in diameter from 100mm to 375mm.

There are currently ten sewage-pumping stations within the Taumarunui reticulation. All have the usual wet well/submersible pump type facilities with the exception of the Victory Bridge station, which has both a wet well and free standing belt driven pumps. All of the wet well pump stations have been equipped with Flygt submersible pumps.

The Taumarunui sewage treatment plant is a relatively modern facility consisting of four main components. The first is a step screen, which removes all solid material above 3mm in size. Screenings are transported via a piston press into a large plastic bag, and then disposed of at the Taumarunui landfill.

Screened sewage passes through two lined facultative aerated lagoons operated in series. The primary lagoon is equipped with four paddle wheel type aerators. These are used to maintain oxygen levels in the ponds to assist with the treatment process, and to stop the formation of odours. The secondary lagoon is equipped with two paddle wheel type aerators. The total aeration capacity is 37kW.

Each lagoon has a capacity of 16,000m<sup>3</sup> that gives a retention time of about 9.5 days at an average inflow of 1,700m<sup>3</sup>/day. The inlet pipework is configured so the primary lagoon operates as such until the depth of sludge in this lagoon is at least one metre. The roles of each lagoon are then swapped so that the secondary lagoon becomes the primary lagoon. The sludge in what is now the secondary lagoon is then "aged" for at least two years before it is removed to land.

Effluent from the secondary lagoon is piped to four wetland cells. The cells have been planted in a native New Zealand sedge *Schoenoplectus validus*; the most common wetland treatment plant utilised in this country. The cells have a combined surface area of about 2.9 hectares and a retention time of about ten days for average flow.

Effluent flows uniformly through the ponds where bacteria and larger organisms attached to the wetland plant stems oxidise organic matter. Further anaerobic biological treatment also occurs on the pond floor.

The final stage of the treatment process is achieved by passing the effluent through an ultra violet disinfection system, which is designed to kill most of the remaining bacteria and viruses.

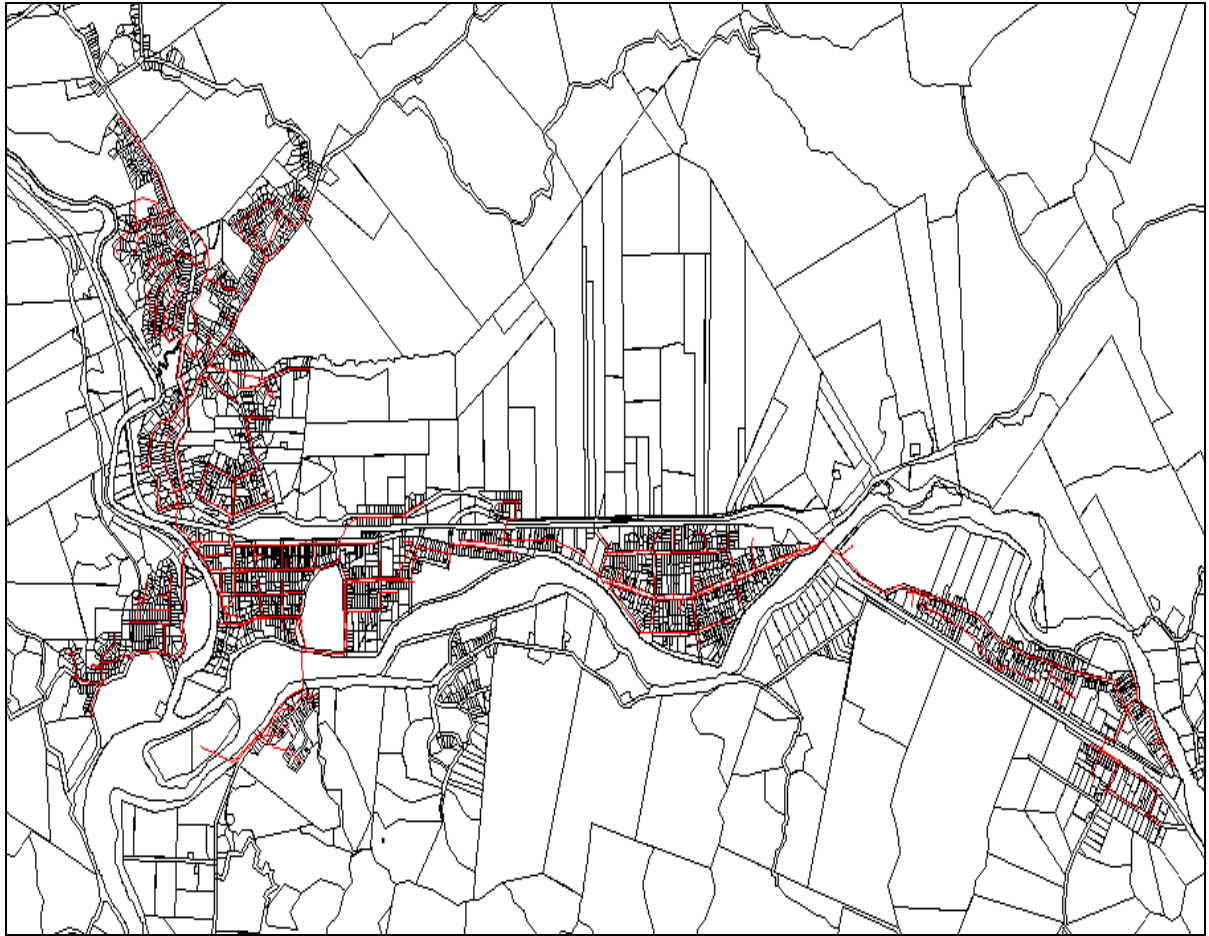


Figure 2: Plan of Taumarunui Sewerage Scheme

**(b) Future Demand**

The capacity of the reticulation is considered to be adequate, as there has been no evidence of manholes surcharging, or sewage spills occurring through low-lying gully traps.

The treatment plant has been designed to cope with 3,900m<sup>3</sup> of domestic strength effluent per day. It is considered that both the reticulation and the treatment plant have sufficient capacity to cope with the current population. It is not expected that the current population will increase significantly during the period covered by this report.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage treatment and disposal schemes. A qualitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in Taumarunui:

- Excessive groundwater infiltration resulting in overflows from reticulation, sewer pump stations and/or treatment plant,

- Unauthorised access to the treatment facility could result in serious injury or fatality.

It is considered that the Taumarunui sewage system generally functions well and no part of the system, treatment plant or treated effluent discharged to the Whanganui River poses a risk to public health under normal circumstances. However there are concerns related to conditions of the old critical AC pumping mains and high infiltration especially in the catchment of Huia Street Pump Station, which can cause overflows from the pump station during periods of heavy rain.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with the system include:

- Investigations to assess the condition of old glazed earthenware (GEW) and Asbestos Cement (AC) pipes in this catchment including CCTV inspection and inflow/infiltration investigations.
- Ensure security at the treatment plant site is maintained, and
- Any decline in discharge effluent quality as indicated from daily monitoring is investigated and attended to immediately.

**(e) Preferred Council Response**

It is recommended that the investigation to assess the condition of pipes in the township be undertaken in coming years as part of the infiltration study. Where identified, the necessary work will then be incorporated in the renewal programme during Council's review of the Sewerage Asset Management Plan in 2005/06.

**5.6.3 Stormwater**

**(a) Services Provided in the Taumarunui Township**

The stormwater system within the Taumarunui Township consists of an extensive reticulated network of roadside sumps, manholes and connecting pipework as well as a number of open stormwater drains and culverts under roads, which have been constructed in the past to convey stormwater and discharge to natural watercourses. Council has generally not maintained the natural watercourses.

Maps produced by Horizons Regional Council show that the estimated flood level in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) would not affect the township in any way. Although Horizons information states a very low flooding risk to the township, historical experience shows that flooding does occur around some watercourses and along the Whanganui River (eg Cherry Grove Reserve).

**(b) Future Demand**

There is an ongoing demand to upgrade existing reticulation and pipe existing open drains within the Township, as well as the continued maintenance of the existing stormwater network.

**(c) Risk Assessment**

A generic risk assessment has been carried out for stormwater disposal systems. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. There were no issues identified in this category for the stormwater system in Taumarunui.

However there would be a serious risk of flooding to properties in the lower lying areas of Taumarunui adjacent to the Whanganui River in the event that the stopbank was breached during a major flood event.

It is not considered that the current reticulated system; open drains, culverts, or natural watercourses present a significant public health risk or environmental risk.

**(d) Options to Address Future Demand and Public Health and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Piping of all open drains,
- Increased maintenance of natural watercourses.

**(e) Preferred Council Response**

It is recommended that Council undertake a programme of staged and ongoing maintenance of natural watercourses and upgrade any sections of the stormwater reticulation that are unable to provide the required level of service.

**5.7 WATER SERVICES - RURAL SETTLEMENTS / RURAL SCHOOLS**

**5.7.1 Water Supply**

There are two rural settlements located within the Taumarunui Ward, Piriaka, and Kakahi. The Township of Piriaka receives a reticulated water supply. There are no other reticulated water services provided to these townships.

**(a) Services within the Piriaka Township**

Piriaka is a rural settlement situated approximately 10 kilometres southeast of Taumarunui. The settlement is situated between State Highway 4 and the Whanganui River and consists of around 40 dwellings and a general store spread over an area of approximately 25 hectares.

**Water Source**

The Piriaka water supply was established by the New Zealand Railways (NZR) to provide water to the local railway station and nearby NZR staff houses. Water is obtained from three separate springs that discharge from an aquifer which surfaces at the base of a cliff at Piriaka, then channelled into

a 23m<sup>3</sup> reservoir. From there it is fed into the reticulation. The complete system is gravity fed.

In 1986 the Council took over the operation and maintenance of the intake, reservoir, and reticulation. There are 43 properties currently connected to the reticulation. Regular monitoring of the supply has shown that one of the springs sometimes becomes contaminated with colony forming units during the summer months. In recent times there has been some incidents of contamination of the second spring. When contamination is detected Council isolate the contaminated spring from the supply and monitor the spring until the contamination is cleared before taking back into service. The reservoir water is also chlorinated temporarily until treated water is cleared of the contamination. Boil water notices are issued to consumers. The cause of the contamination is unknown and it may be necessary therefore to install some means of disinfecting the water permanently before it is fed into the reticulation sometime in the future.

The Ministry of Health has not yet graded the Piriaka water supply. However the water supply will not obtain the minimum Grade C because of the occasional contamination that is occurring and the absence of provision for disinfection.



Figure 3: Piriaka Infrastructure

The reticulation system is not suitable to sustain any standard of fire flows. However a 22.5m<sup>3</sup> concrete tank with a hydrant installed at the outlet to the tank has been provided at one end of the distribution system for fire fighting water supply.

The supply pressures within the reticulation are below the specified minimum pressure of 250kPa. With no leaks and very low breakage the condition of the reticulation mains can be regarded as good.

The Piriaka system was not designed to provide flows that comply with any standard. The typical pressure in the township is 130 kPa.

#### Water Quantity

The amount of water that can be delivered is entirely dependent on the flow from the springs. Flows are constant throughout the year. The current water right to take water allows Council to take 1,400 litres/hour from the springs. The right expires on 12 February 2018. The approval was made on an estimated quantity at that time of application in 1998. The consumption has been monitored since January 2003 and has been found to average around 45m<sup>3</sup> per day. The system's standby water storage capacity is limited to what the reservoir can provide, which is 23m<sup>3</sup>. With the average daily consumption at 45m<sup>3</sup> per day, the available storage is considered not adequate to guarantee continuity of supply. This has been illustrated by shortages of supply in the past at times during the summer months.

#### Water Quality

The Ministry of Health have not yet graded the supply. Surveillance testing undertaken by Council has shown the microbiological quality of water taken from two of the three springs on occasions is unsatisfactory during the summer months. As mentioned previously, the reason for this is unknown. It is thought that perhaps contamination is somehow occurring between the point where the spring exits the aquifer and where it enters the intake pipe, or at the unprotected open intake itself.

There are no backflow prevention devices in existence in Piriaka. However, because of the low water pressures existing in the township it is unlikely that that backflow will ever become a problem.

### **(b) Services Provided Within the Kakahi Township**

Kakahi is situated approximately 15 kilometres southeast of Taumarunui. The settlement is situated on the Waitea Branch Road approximately 4km from the junction with State Highway 4 and consists of around 40 dwellings, a school, a general store and a marae spread over an area of approximately 40 hectares.

#### Water Source

Water supplied to the Kakahi School and a number of other dwellings within Kakahi is obtained from the Kakahi Spring. The remainder of the community obtains water either from other springs, rainwater collected off the building's roofs or a combination of both. A community group, Kakahi Inc Water Society, maintains the water supply from the Kakahi Spring.

### Quantity

The flow from the Kakahi spring is ungauged but would appear sufficient to supply the school and other dwellings currently connected to it. Tank supplies generally appear to be adequate for the dwellings relying on this form of supply.

### Quality

The Kakahi sources of water supply are ungraded by the Ministry of Health. The draft Annual Review of Drinking Water Quality produced by the Ministry of Health for 2003, indicates that the water from the Kakahi Spring is not monitored for bacteriological or protozoan compliance. Although water obtained from these sources may be considered to be potable, it is evident that the sources would not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS:2000) as is evident from recent contamination of the supply. Community education on the risks associated with the water supply and improved maintenance of water storage tanks is recommended.

## **(c) Services Provided in Rural Schools**

There are two rural schools within the Taumarunui Ward situated in relatively isolated locations away from any other significant communities. These schools are located at Ngakonui and Ngapuke and cater for between 28 and 130 pupils.

### Water Source

According to the *2003 Edition of the Register of Community Drinking Water Supplies in New Zealand*, the Ngakonui School obtains water from a bore on the school grounds, whilst the Ngapuke School obtains water from the adjacent Punga Punga River. These sources are operated and maintained by the respective school's Boards of Trustees.

### Quantity

The supplies from both the Ngakonui School bore and the Punga Punga River appear sufficient to supply the respective schools.

### Quality

Both sources of water supply are ungraded by the Ministry of Health. Data supplied by the Waikato District Health Board covering the period since 1999, indicates that there have been no reported cases of water borne diseases specifically from either of the areas serviced by these rural schools. The schools take water samples, which are tested, at an accredited laboratory.

From the draft Annual Review of Drinking Water Quality produced by the Ministry of Health for 2003, neither of the schools achieved bacteriological or protozoan compliance for the 2003 year. Although water obtained from these sources may be considered to be potable, it is evident that the sources would not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS:2000).

### 5.7.2 Future Demand

The normally resident population of Piriaka is around 100 persons with a peak population of around 120 persons. The population has been reasonably stable over previous years and is not expected to increase to any extent over the period covered by this Assessment. Consequently it is not expected that there will be any greater demand for water supply during this period assuming the spring is able to continue to provide a consistent flow as has been experienced to date.

The population of Kakahi is not known, but is considered to have remained reasonably stable over previous years and is not expected to increase to any extent over the period covered by this report. Consequently it is not expected that there will be any greater demand on the water supply during this period assuming the spring is able to continue to provide a consistent flow as has been experienced to date.

#### (d) Risk Assessment

A generic risk assessment has been carried out for all water supply schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment.

From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in Piriaka:

- Contamination of the water supply at the source,
- Contamination of the water supply in the reservoir from the ingress of vermin or vandalism (unauthorised access),
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

Surveillance testing undertaken by Council has shown the microbiological quality of water taken from the springs to be unsatisfactory on occasions. It is thought that contamination could be occurring between the point where the spring exits the aquifer and where it enters the intake pipe, or at the unprotected open intake itself.

Although the community is proud of chemical free water and resisted chlorination in the past, the bacteriological quality of water will neither be guaranteed nor comply with Drinking Water Standard New Zealand 2000. This is considered not satisfactory as the health of whole community is at risk.

From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the Kakahi community:

- Contamination of the water supply at the source (as has recently occurred),
- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access),

- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

Both of these communities are considered to potentially be at risk to contracting water borne diseases from drinking untreated water.

**(e) Options to Address Future Demand, Public Health, and Environmental Issues.**

The options available to address or mitigate the issues and risks associated with the Piriaka system include:

- Undertake a community education campaign on the importance of water treatment for the minimisation of risk to the public from water borne diseases,
- Upgrade the Piriaka water supply scheme,
- Extend the Taumarunui reticulation up to Piriaka to supply high quality treated water.

The options available to address or mitigate the issues and risks associated with the water supply in other rural communities include:

- Status quo – no council involvement,
- Provide a reticulated water supply system,
- Undertake an education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards

**(f) Preferred Council Response**

It is recommended that Council undertake a community education programme in rural settlements and schools to increase public awareness of water borne diseases and the importance of appropriate water treatment.

The New Zealand Water and Waste Association have recently produced a booklet titled 'The Story of Drinking Water' which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that this booklet is provided to all properties that currently source and provide their own water supply.

United Water, as part of the 'value for money items' offered at the time of tender, are to undertake a network model analysis to confirm the feasibility of extension of the Taumarunui water supply network to Piriaka. If this option is indeed feasible, it will need to be compared with the cost of upgrading the existing Piriaka water supply scheme to meet current and anticipated standards. This will be evaluated during the revision of Council's Water Supply Asset Management Plan in 2005-2006 with any decision communicated through Council's Future Ruapehu: Long Term Plan 2006-2016.

### 5.7.3 Sewerage

#### (a) Services Within the Rural Communities

There is no Council operated sewage system in Piriaka or Kakahi. Sewage from the various dwellings, schools, and marae is treated by individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

#### (b) Demand Projections

The population of these rural settlements is not expected to increase significantly over the period covered by this report and consequently it is not expected that there will be any significant increase in discharge of sewage effluent to ground.

#### (c) Risk Assessment

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From this risk assessment that there were no issues identified for the on-site treatment and disposal of sewage, which attracted a profile of 6 or higher. Further information on this risk assessment is provided in Appendix 1.

Data supplied by the Waikato District Health Board covering the period since 1999, indicates that there were 3 reported cases of communicable diseases from the Kakahi area. However, the public health risk to residents of both Piriaka and Kakahi is considered negligible due to the low population density of the area.

#### (d) Options to Address Future Demand, Public Health, and Environmental Issues

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement,
- Undertake an education campaign on the importance of maintaining septic tanks.

#### (e) Preferred Council Response

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, such as regular cleaning. Increased public awareness will assist in reducing both the environmental and public health risk from the disposal of sewage to ground.

The New Zealand Waste and Water Association have recently produced a booklet titled 'The Story of Your Septic Tank' which gives a 'hands on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet is provided to all properties that currently dispose of their wastewater through a septic tank system.

#### **5.7.4 Stormwater**

##### **(a) Services Provided in the Rural Communities**

The stormwater systems within the rural settlements consist mainly of roadside drains, open stormwater drains and culverts under roads that have been constructed in the past to convey stormwater through the settlements and eventually discharge into adjacent creeks or waterways. These systems have received minimal maintenance by Council over the years.

There are no formal stormwater discharge systems at the rural schools. Stormwater from the school building roofs and adjacent surfaced areas is discharged via natural overland flow paths to adjacent creeks or waterways.

Maps produced by Horizons Regional Council show that the estimated flood level in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) would not affect either of the major rural townships, Piriaka and Kakahi.

##### **(b) Future Demand**

Apart from continued maintenance of the stormwater network, it is considered that the existing network is adequate for the discharge of stormwater from the township under normal circumstances and will not be expanded to any extent.

##### **(c) Risk Assessment**

From the risk assessment process which is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher.

##### **(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status Quo,
- Increase or improve maintenance of open drains, or
- Pipe all open drains.

##### **(e) Preferred Council Response**

As the current stormwater network in these rural settlements provide no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

## **5.8 WATER SERVICES – MARAE**

### **5.8.1 Services Provided to Marae**

There are ten marae spread throughout the Taumarunui Ward, marae recorded in the 2001 census are listed in Appendix 4. Council does not currently have any information relating to the provision of Water Services to the marae that are not connected to Council systems.

#### **(a) Water Supply**

It is assumed that as most of these marae are in rural areas, water is obtained from nearby springs, bores or collected off roofs of marae buildings and stored in tanks on site.

#### **(b) Sewerage**

It is also assumed that where a particular marae is not connected to the Council sewage system, sewage is disposed of by means of on-site septic tanks and effluent disposal to ground by means of soakage fields.

#### **(c) Stormwater**

It is envisaged that stormwater from the marae building roofs and surfaced areas would be discharged to ground via natural run-off patterns where no formal stormwater discharge system exists.

### **5.8.2 Future Demand**

Due to their very nature, there will always be a fluctuating demand placed on the water services for marae. There may be periods where there is little or no activity on a marae, and other times where the water supply and sewage disposal systems may be under considerable 'load'. The capability of the relative systems' ability to cope under these circumstances will depend on their original design and construction and how they have been developed and maintained over time.

### **5.8.3 Risk Assessment**

It is considered that water services associated with rural marae could potentially present a significant public health risk due to the ability (or lack thereof) at times to supply large groups of people with untreated drinking water which may have been stored for some time and could be at risk to being contaminated, as well as sewage systems that may not be able to cope with peak loadings.

### **5.8.4 Options to Address Future Demand and Public Health and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement,

- Undertake an education campaign on the importance of maintaining septic tanks,
- Undertake an education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

#### **5.8.5 Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, and increase public awareness of water borne diseases and methods to eliminate these risks. Increased public awareness will assist in reducing both the environmental and public health risks from these services.

The New Zealand Water and Waste Association have recently produced two booklets titled 'The Story of Your Septic Tank' which gives a 'hands-on' approach to the operation, care, and maintenance of septic tanks, and 'The Story of Drinking Water', which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that these booklets be provided to all marae that currently dispose of their wastewater through a septic tank system and/or source and provide their own water supply.

## 6.0 NATIONAL PARK WARD

### 6.1 INTRODUCTION

6.1.2 The National Park Ward is the second smallest ward by area and the smallest by population in the District. The Ward is situated between the Taumarunui Ward (to the north) and Waimarino/Waiouru Ward (to the South).

6.1.3 Key Statistics for the National Park Ward are provided in the following table.

National Park Ward – Key Statistics	
Population	1029
Area	1242km <sup>2</sup>
Number of water connections	397
Number of properties on metered water supply or extraordinary users	84
Number of rateable properties	893
Main Industry	Tourist Industry/Agriculture
Possible Growth Industry	Tourist industry, dairy farming
Rural Settlements	National Park Village, Owhango, Raurimu
Number of Schools	2

Table 12 Key Statistics for National Park

### 6.2 SETTLEMENTS

#### 6.2.1 National Park Village

There are four main settlements within the National Park Ward. The largest of these settlements is National Park Village. National Park Village is located at the junction of State Highways 4 and 47. The Village is the gateway to the Whakapapa ski fields and the Tongariro National Park. The main industry in the Village is tourist accommodation and associated services (petrol station, cafes bars restaurants) and the Tongariro Timber Mill.

The census usually resident population on was 234 in 2001, which is a slight decline from 237 (-1.3%) since the 1996 census. Whilst the usually resident population in National Park Village is relatively static, this population grows dramatically with the influx of tourists through the winter ski season.

#### 6.2.2 Owhango

Owhango is situated on State Highway 4, between Taumarunui and National Park. Dairy, cattle, sheep, and deer farms with stunning rivers and bush surround the township. The township has a growing tourist industry being a base for tourists exploring the Tongariro Forest and National Park.

Several main rivers are easily accessible from the township with rafters, kayakers, and canoeists enjoying the Whakapapa and Whanganui Rivers. The census usually resident population for the Owhango Township was 207 in 2001, which is a reduction of 12 (-6%) since the 1996 census.

### 6.2.3 Whakapapa Village

Whakapapa Village is located in the Tongariro National Park on the lower northwestern slopes of Mount Ruapehu. Access to the village is via State Highway 48, the extension of which, Bruce Road, ends at the Iwikau Village at the base of the Whakapapa Ski field. The Village primarily acts as a service centre for the workers and visitors to the Whakapapa Ski field and surrounding Tongariro National Park.

### 6.2.4 Raurimu

Raurimu is situated just off State Highway 4, north of National Park. The famous Railway spiral is located above the township. The township is surrounded by beautiful native bush.

## 6.3 CEMETERIES

### 6.3.1 Services within the National Park Ward

#### (a) **Urupa (Maori Tribal Cemeteries)**

From the information available it is known that there is one Urupa situated within the National Park Ward.

#### (b) **Cemeteries**

There are two cemeteries in the National Park Ward, one in Owhango on State Highway 4 and one at Raurimu on Kaitieke Road. Both of these cemeteries are open cemeteries.

There is partial mechanical mowing at both cemeteries with the balance of the developed and undeveloped areas grazed by sheep or miniature horses. The Owhango cemetery comprises 1.53 hectares and there is approximately 1 interment per annum. The Raurimu cemetery comprises 0.86 hectares and there is approximately 1 interment every 5 years. Both cemeteries have capacity for an estimated 1000+ years

Cemetery	Location	Area (ha)	Current and Estimated Future Burials / Year	Estimated Life (years)
Owhango	State Highway 4 Manunui	1.526	1	1000+
Raurimu	Kaitieke Road	0.8605	0.20	1000+

Table 13: National Park Ward Cemeteries

### **6.3.2 Demand Projections**

All of the townships in the National Park Ward including, Owhango, Raurimu, and National Park are comparably small townships. Owhango, Raurimu, and National Park have a mix of permanent and holiday homes although there has been a pattern of increased numbers of permanent residents in all of these, which may slightly increase the number of interments per annum in the future. The capacity will be able to meet any future demand.

### **6.3.3 Risk Assessment**

A risk assessment has been carried out on the cemetery service provided within the National Park Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the cemetery services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

### **6.3.4 Options to Address Future Demand, Public Health, and Environmental Issues**

The capacity of both cemeteries within the National Park Ward far exceeds any possible future demand. There are no known public health or environment issues arising from the operation of these cemeteries.

## **6.4 PUBLIC TOILETS**

### **6.4.1 Services within the National Park Ward**

There are numerous Department of Conservation public toilets located at the start and finish of many of the walking tracks throughout the Tongariro National Park and at various points on well-known longer tracks e.g. the Tongariro Crossing. There is also a Department of Conservation toilet located at the start of the Ohinetonga Walk on the Whakapapa River at Owhango. The majority of the Department of Conservation toilets are waterless “long drop” types.

There is one Council owned and maintained public toilet facility in the National Park Ward, situated at Carroll Street, National Park Village. This facility is a small concrete block structure comprising one male and one female area.

Visitor numbers to the mountains and other Department of Conservation reserves in the National Park Ward are high, however National Park is generally a final destination point, rather than a through travellers stopping point. There is one general retail outlet, the BP Petrol Station on State Highway 4, which has a toilet facility for its customers.

The use of the public toilets is known to be much higher in the peak summer tramping season and peak winter skiing season. Users are likely to be patrons of ski / tramping gear hire shops in the locality, rather than through travellers.

In addition to the toilets in the BP service station in National Park, which cater for their customers, there are numerous cafes, restaurants, and hotels in National Park Village including toilets at the National Park Railway Station, which are available to both restaurant customers and train travellers.

There are also cafes, restaurants, hotels, and a visitor information centre at Whakapapa Village, which provide toilet facilities for their patrons. Ruapehu Alpine Lifts caters for its patrons to the Whakapapa Ski Field with various toilet facilities on Mount Ruapehu, most of which are closed out of the ski season. There is also a public toilet facility available to the general public at the top of the Bruce Road, 365 days of the year.

There is one hotel in Owango, which has toilet facilities of the use of their customers.

#### **6.4.2 Demand Projections**

There is the possibility that there will be an increase in demand for a modern flushing public toilet facility at Owango on State Highway 4. Particularly by visitors walking, picnicking or fishing in the area who currently have no option but to use the Department of Conservations basic “long drop” facility on the Whakapapa River.

If tourist non food outlet retail activity in National Park Village were to increase significantly, e.g. if the National Park Saw Mill were to open its facilities to tourists, there may be the need to provide additional public toilet facilities, particularly if tourist buses began stopping at National Park Village for any length of time.

#### **6.4.3 Risk Assessment**

A risk assessment has been carried out on the public toilet service provided within the National Park Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the National Park Ward Public Toilets that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

#### **6.4.4 Options to Address Future Demand and Public Health and Environmental Issues**

If a new public toilet facility were required at either Owango or National Park Village, location difficulties would arise as Council does not own surplus land in either location. There are suitable areas of unused railway land that Council may be able to obtain rights of tenure over if demand became so high or necessary that Council wished to construct new toilet facilities.

The Department of Conservation has recently constructed a closed sewage disposal system on Mount Ruapehu. This system is capable of taking and disposing of all sewage waste from the Whakapapa Village and skifield, huts, lodges and other facilities with minimal environmental impact. The flushing

public toilet facilities on the mountain have now been connected to this infrastructure removing environmental concerns.

If the use of the Tongariro crossing walking track continues to increase the lack of toilet facilities may result in trampers urinating or defecating on the flora alongside of the track, which may be of concern in both a public health and environmental sense. The only option available to address this potential problem would be the installation of additional facilities.

There are no current or foreseeable public health or environmental issues in the National Park Ward.

#### **6.4.5 Preferred Council Response**

Council will monitor the increase in tourism in the area.

### **6.5 SOLID WASTE**

#### **6.5.1 Services Within the National Park Ward**

There are two transfer stations in the National Park Ward; located at Owhango and National Park townships. These two transfer stations have 24-hour access seven days a week for small quantities of refuse; the transfer stations are also attended at specific times. Many commercial enterprises are utilising the site after hours in order to reduce the costs of disposal.

The Owhango Transfer Station is developed on part of the previous closed Owhango Landfill and is situated down a narrow road off State Highway 4, Owhango. In addition to providing the standard services this site also has capacity to store bulky recyclables.

Resource consents are held for the closed Owhango Landfill site. This site is monitored as required by Resource Consents. Monitoring reports are completed and provided to Horizons Regional Council.

The National Park Transfer Station is located down a private access road, however this road is commonly known as either Mill Road or Fisher Road. The transfer station is located on undeveloped road reserve; hence the area available is long and narrow, limiting the activities onsite. The recycling facilities at the station often exceeding the capacity for the site, for both bulk recyclables and those deposited through the recycling container. The station is also located out of public view, which encourages abuse of the site.

The following table provides more information on the locations of these transfer stations.

<b>Transfer Station</b>	<b>Location</b>	<b>Area (Ha)</b>	<b>Status</b>
Owhango	State Highway 4, Owhango.	0.6 Hectares leased. 0.1 Hectares of old landfill.	This land is leased. The term of the lease is until 31 Oct 2016, with a renewal provision 1 Nov 2006.
National Park	Private Access Road, National Park	.05	This land is road reserve.

Table 14: Location and Status of Transfer Stations

There are no solid waste facilities at Raurimu Township with the residents able to utilise facilities both north and south of the township.

Tongariro National Park has its own transfer station at the Whakapapa village servicing its own facilities, including restaurants, hotels, and accommodation. The community utilises the District Landfill at Taumarunui and Council contractors currently take all recyclables to market.

### **6.5.2 Demand Projections**

These two small towns (National Park Village and Owhango) are significant providers of tourist accommodation and are therefore subject to high 'peak' populations during winter. National Park Village has seen a large amount of growth in the tourist accommodation industry in the last 5 years. The usually resident population however is relatively stable. As tourist numbers to the Ruapehu District continue to increase the gap between peak population and usually resident population will also increase in towns such as National Park and Owhango.

This type of population variance makes it difficult to manage Council assets at an affordable level for the resident population but with adequate capacity to accept the large increases in refuse produced during peak tourist seasons.

Performance of these transfer station sites is affected by the capacity and quality of the asset. The efficiencies that can be gained at these sites are relative to public behaviour in separating waste into the designated areas. Greater efficiencies are achieved in disposal of items such as steel and green waste if these can be stock piled onsite for at least 6 months. This option is not possible at the National Park Village site.

Largely the performance of both sites is acceptable, however anecdotal evidence suggests that the National Park Village Community would like a higher level of service.

### **6.5.3 Risk Assessment**

A generic risk assessment for larger transfer station sites such as Owhango and National Park Village has been undertaken. A quantitative risk

assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment.

Nine issues have been identified as being potential high risks to larger transfer stations being

- Potential breach of Resource Management Act 1991 from the discharge of contaminants into the environment,
- Odour beyond the property boundary,
- Isolation of the site,
- Hazardous Waste entering the site,
- Capacity for items at a transfer station,
- Unconforming material being deposited at uncontrolled transfer stations,
- Increasing operational costs due to public abuse,
- Population growth, and
- Health and safety issues.

These issues raise concerns in regards to capacity, health and safety, breach of legislation and potential odours beyond the property boundary. Both the Owhango and National Park Village sites are open to the public 24 hours per day with unrestricted access. There is reduced control over the material deposited within the site and the risks of hazardous waste entering the site are high. It has been through diligence of the contractor and Council staff that an environmental incident has been avoided.

The capacity of the recycling collection facilities has also been questioned, for example glass and cardboard are often placed beside the receptacle, despite the receptacles being empty. .

Further information on this risk assessment process is provided as Appendix 1.

#### **6.5.4 Options to Address Future Demand, Public Health, and Environmental Issues**

There are several options available to address the risks identified above, including:

- Status quo - Accept the level of risk and continue,
- Only allow access to the transfer station during attended hours,
- Move the transfers stations,
- Close one or both of the transfer stations.

#### **6.5.5 Preferred Council Response**

It is recommended that the options identified to reduce the potential risks from solid waste services be further investigated during the review of Council's

Solid Waste Management Plan in 2005/06, with implementation of any agreed changes in 2006/07.

## 6.6 WATER SERVICES – NATIONAL PARK VILLAGE

### 6.6.1 Water Supply

#### (a) Services Provided in National Park Village

National Park is a small township situated at the junction of State Highways 4 and 47. The township caters mainly for the tourist market over the winter ski season with increasing usage over the summer months as well.

#### Water Source

Water is taken from the Mangahuaia Stream within the Tongariro National Park and piped 1,982 metres to a treatment plant alongside State Highway No.47 via a 150mm diameter HDPE and uPVC pipeline. Treatment consists of filtration and chlorination. Treated water is then piped 3,502 metres to a 500m<sup>3</sup> timber tank reservoir, which is 2,305 metres from the commencement of the reticulation. The complete system is gravity fed, including the filter backwash.

None of the properties in National Park are metered. The Ministry of Health has not yet assessed the National Park water supply. However, the treated water meets the requirement of Drinking Water Standards New Zealand 2000 for E coli compliance.

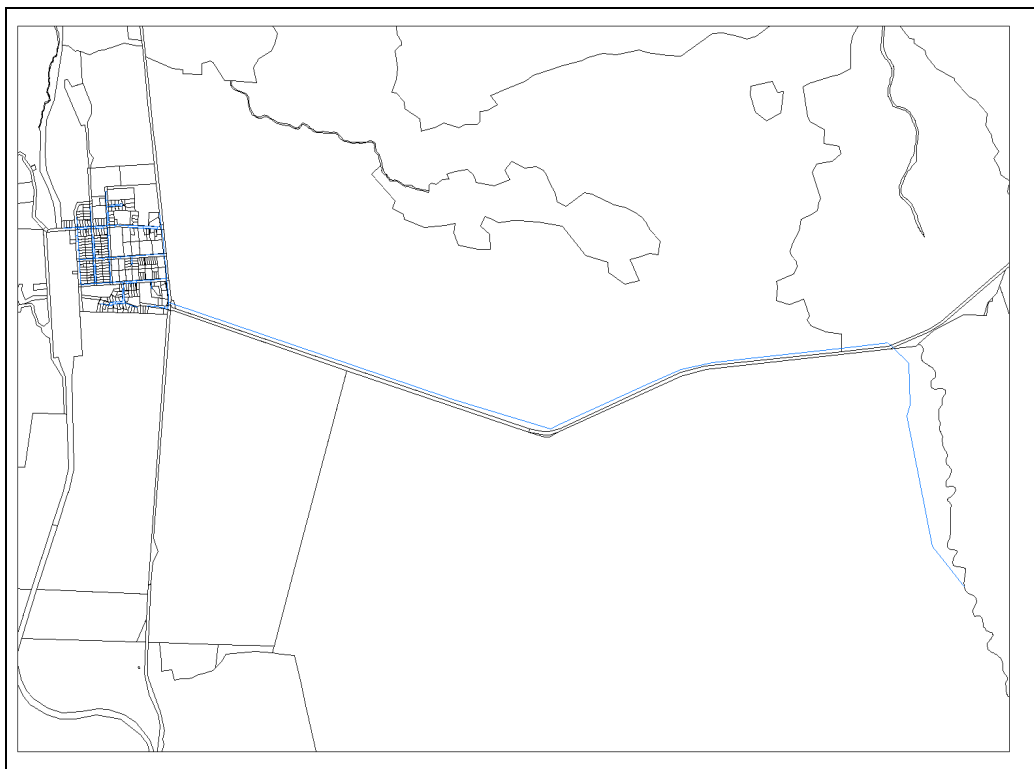


Figure 4: National Park Infrastructure

### Quality

The catchment above the intake is unprotected, but as it is entirely within the Tongariro National Park, contamination will only emanate from the occasional feral animal that strays into the area. The catchment is mostly covered in tussock and beech forest. There is a remote possibility that contamination could occur from an eruption of Mount Ruapehu.

The Ministry of Health has yet to grade the supply. The Ministry defines the level of treatment given to the raw water taken from the Mangahua Stream as partial as the water is only filtered and chlorinated. There is therefore a low level of confidence that water leaving the plant will always be safe. However, the treated water is monitored daily at the treatment plant and distribution system for residual chlorine and weekly for Ecoli to ensure that it is safe to drink.

The Drinking Water Standard New Zealand 2000 requires that the water leaving treatment plant should also comply and monitored for protozoa in addition to E coli. Currently the treatment provided would not comply with this requirement, which is only a guideline not mandatory. This however is acceptable for a small community such as National Park. This may also affect the grading of the distribution system. The water chemical quality is of a good standard.

There are no backflow prevention devices in existence in National Park. However it is Council's policy to install backflow prevention on all new service connections and when existing service connections are renewed.

### Quantity

The amount of water that can be abstracted from the Mangahua Stream is currently set at 500m<sup>3</sup>/day, which is about 3% of the summertime low flow. It should be noted however that maximum usage occurs during the height of the winter ski season. The treatment plant is capable of treating up to about 870m<sup>3</sup>/day. Current usage averages 220m<sup>3</sup>/day and the maximum consumption recorded in one day was 440m<sup>3</sup>. The Manawatu-Wanganui Regional Council issued the present water permit on 12 December 1996 for a period of 30 years.

The storage is sufficient to meet 1.8 days of the average daily demand from full and more than adequate to ensure continuity of supply including for fire fighting; and exceeds the Target Levels of Service requirement of minimum 1-day storage. Isolation valves are well located around the reticulation network and in sufficient numbers to isolate localised areas for maintenance work. There has never been any need for applying water restrictions or limiting the supply in any way since the scheme was commissioned.

The water supply system has been designed to provide a minimum fire fighting flow of 45 litres/second, and at the same time a residual domestic flow of 10 litres/second, giving a total of 55 litres/second. At the time the scheme was designed it was considered that the appropriate fire risk category for the township was a D rating. Hydrants are well located throughout National Park and no requests have been received from the New Zealand Fire Service to improve the system. The water supply system has been designed for a

population of 1750. The present permanent population is 240, which is estimated to increase to around 1000 at the height of the ski season.

As the scheme is relatively new the only leaks that have occurred since the date of commissioning have been the result of accidental damage, or in one case, the result of faulty workmanship in laying the original pipework. Leakage is not expected to be a problem for many years to come therefore.

**(b) Future Demand**

National Park Village is one of the few growth areas in the Ruapehu District and hence there is increasing demand being put on the water supply. However as has been stated above the existing system was designed for a population of 1750 and thus is considered will have sufficient spare capacity during the period covered by this report.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. From the risk assessment process, which is provided in Appendix 1, the following issues have been identified as being potential high risks associated with the National Park water supply:

- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access).
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

There have been a number of incidents of communicable diseases recorded from the National Park area by the Waikato District Health Board, however it is not considered that the community are at risk of contracting water borne diseases from drinking inadequately treated water.

**(d) Options to Address Future Demand and Public Health and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Further development of the scheme to improve Ministry of Health grading of the water supply.
- Development of an inbuilt back flushing system.

**(e) Preferred Council Response**

It is recommended that the development and upgrade plan of this network be reviewed, and that it include upgrading of the water treatment plant to improve the Ministry of Health grading of the water supply. This upgrade would include flow metering and flow paced chlorination; and the installation of a system to facilitate regular flushing of the intake pipeline. It is suggested that

these works occur in 2006/07 after confirmation of community approval by consultation through the Future Ruapehu Long Term Plan in 2005/06.

Continuity of supply has been affected in the past due to occasional blockage of the intake pipe due to floating debris. The present arrangement to back flush the raw water main is not satisfactory. An in built system needs to be installed to facilitate the maintenance and ensure continuity of supply.

## **6.6.2 Sewerage**

### **(a) Services Provided in National Park Village**

National Park's sewage system was commissioned in 1988. Prior to this there was no community sewage system in the township. The ground on which National Park is built is generally unsatisfactory for septic tank soakage purposes.

The flow from the entire catchment is by gravity. The reticulation consists almost entirely of 150mm and 225mm diameter uPVC pipe.

Hydraulically the system has performed well since installation. Current wastewater flows are below design capacity of the reticulation; and as such the system is not hydraulically stressed any way. However analysis of treated effluent flows over one year cycle indicate some significant degree of infiltration.

The treatment plant consists of two ponds. The primary pond has a volume of 15,629m<sup>3</sup>, while the secondary pond can hold 7,615m<sup>3</sup>. Both ponds have performed well since commissioning, which is mainly attributable to the low loading they have been required to deal with to date. The treatment plant's capacity will be determined by the ability of the plant to cope the winter flows when the combined resident and tourist population reaches its peak and microbiological activity in the naturally aerated oxidation ponds is at its lowest. Although Horizons Regional Council has reported non-compliance with treated effluent quality in the past, especially with regard to concentration of ammonia, it is considered that it is not attributable to the plant performance. The discharge of farm run off into the wetland area and between the wetland and the confluence of the wetland effluent with Makeretu Stream; and the wrong sampling location used for monitoring are considered the main reasons high ammonia levels recorded in Horizons reports. Horizons were notified of the situation and has now started taking samples from the correct location stipulated in the resource consent. The performance of the plant need to be monitored for at least one more year before any conclusion can be drawn on current performance of the plant with regard to ammonia removal.

Both ponds have sectional concrete wave bands in place to prevent erosion. Parts of these have given problems in the past and some sections have had to be replaced because they have become displaced and/or broken. Further heaving of the concrete bank has been noticed recently and these sections need to be replaced. However the overall condition of the plant is considered as acceptable.

A Palmer Bolus flume flow-measuring device has been installed on the outlet from the secondary pond prior to effluent being discharged to the wetlands. The wetlands consist of six small timber shored earth dams downstream of

the outlet from the secondary pond. These have the effect of slowing down the flow, which in turn permits algae and nutrients to be removed by naturally growing plants.

**(b) Future Demand**

It is considered that the capacity of the existing treatment plant and reticulation system is adequate for the foreseeable future. However, if future monitoring of the treated effluent into Makeretu Stream shows high levels of ammonia, improvements to wetlands and forced aeration for oxidation ponds will be required to meet resource consent conditions.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process which is provided in Appendix 1, the following issues have been identified as being potential high risks associated with the National Park sewage collection, treatment and disposal system:

- Unauthorised access to the treatment facility could result in fatality due to drowning. Improper access to oxidation ponds and wetland has been identified as an OHS (operational health and safety) issue. The existing access to the treatment plant is across private farm land via a legal Right of Way.
- Breach of Resource Consent conditions could result in major environmental impacts and health concerns.

**(d) Options to Address Future Demand and Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Ensure security at the treatment plant site is maintained,
- Any decline in discharge effluent quality as indicated from routine monitoring is investigated and attended to.

**(e) Preferred Council Response**

It is recommended that Council take steps to ensure that the security of the treatment plant site is maintained.

**6.6.3 Stormwater**

**(a) Services Provided in National Park Village**

The stormwater system in the National Park township area consists of a reticulated network of roadside sumps, manholes and connecting pipework as well as a number of open stormwater drains and culverts under roads, which have been constructed in the past to convey stormwater and discharge to

natural watercourses. Council has generally not maintained the natural watercourses.

A recent hydrological study of the township by a consultant engaged by Council has shown the expected flood levels and flow paths in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood). This event would result in minor short duration ponding in some areas.

**(b) Future Demand**

There is an ongoing requirement to upgrade and pipe existing open drains within the township as well as the continued maintenance of the existing stormwater network.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process, which is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher. It is not considered that the current reticulated system, open drains, culverts or natural watercourses present a significant public health or environmental risk.

Although analysis has not highlighted any significant risk in relation to the stormwater service provision in National Park Village, a number of the Villages residents do not consider that open drains and culverts are acceptable, however Council does not consider that these open drains and culverts present a significant public health or environmental risk.

**(d) Options to Address Future Demand and Public Health and Environmental Issues**

Although risk analysis has not highlighted any significant risks in relation to this service, the following options have been developed to address publicly perceived risk with this service:

- Increased or improved maintenance of open drains,
- Piping of all open drains,
- Status quo

**(e) Preferred Council Response**

Although the current National Park Village stormwater network provides no significant risks to public health or the environment, it is recommended that Council maintain an appropriate level of service that protects and prevents inundation of property in storm events having an Annual Exceedence Probability (AEP) of less than 10% - (1 in 10 year storm)

## 6.7 OWHANGO

### 6.7.1 Water Supply

#### (a) Services Provided in Owhango Township

Owhango is a small township situated on State Highway 4 approximately 20km southeast of Taumarunui.

Water is taken from a stream within the Tongariro Forest known locally as Deep Creek. The intake structure is approximately 3.5 kilometres southeast of the township. The catchment above the intake is 1,270 hectares in area, and consists mainly of cut over second growth native bush, which was logged in the 1920's.

Water is piped 4,070 metres to a treatment plant sited on land owned by Owhango Farms Ltd. Treatment consists of screening and chlorination. Treated water is then piped to a 270m<sup>3</sup> timber tank reservoir, and from the tank to the reticulation. The entire system is gravity fed.

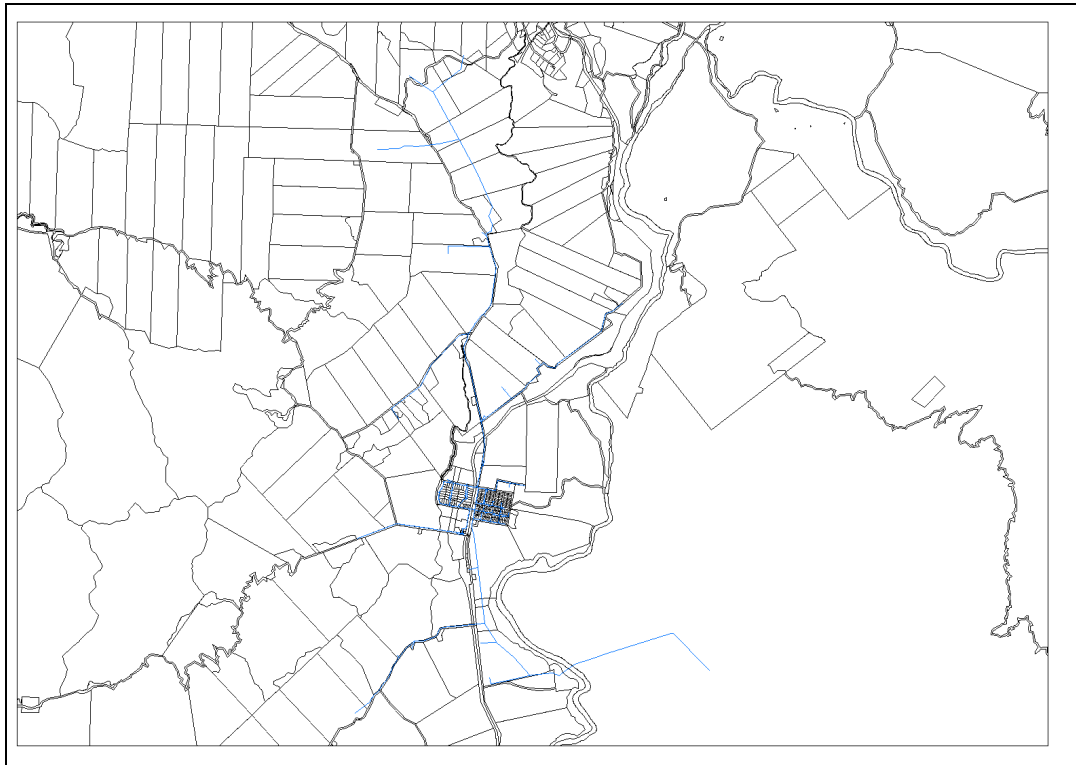


Figure 5: Owhango Infrastructure

The catchment above the intake is unprotected, and entirely within the Tongariro Forest. The area is popular with trampers, mountain bike riders, and recreational hunters. The forest is well stocked with deer and wild pigs. Faecal coliform contamination of the raw water is therefore very likely. The catchment is mostly covered in second growth bush, having been logged in the 1920's. There is a remote possibility that contamination could occur from an eruption of Mount Ruapehu or Mount Ngauruhoe

The Ministry of Health has graded the supply *D*. The Ministry defines the level of treatment given to the raw water taken from Deep Creek as partial as

the water is only screened and chlorinated. There is therefore a very low level of confidence that water leaving the plant will always be safe. The grading could be improved by installing filters, but those connected to the scheme have indicated that they are not prepared to pay anything towards such an upgrade, and it could be some time before this is done. However it is essential that the community is educated on the need to have full treatment to their water supply.

The distribution network has a *d* grading which is also less than satisfactory. Although the distribution system is relatively new, the quality of water in the distribution system and lack of preventative measures such as backflow prevention in the distribution system are taken into account in the grading of the distribution system. The water chemical quality is of acceptable standard. The reticulated water supply is disinfected and regularly monitored for presence of E coli.

There are no backflow prevention devices in existence in Owhango Township. However all new service connections and any future renewal of service connections will be provided with backflow prevention. Rural users are protected against backflow contamination because of their storage tanks.

The amount of water that can be abstracted from Deep Creek is currently set at 1000m<sup>3</sup>/day, which is only approximately 19% of estimated stream low flow. The current water permit was issued on 20 March 2001 and expires on 20 March 2016. In order to meet the increase in demand within rural farms application has been lodged to increase the water take from the stream to 1760m<sup>3</sup>/day.

Hydraulic analysis using the EPANET model showed that the raw water pipeline could deliver up to 1800m<sup>3</sup>/day. It is unlikely therefore that there will be any need to restrict usage in the foreseeable future, provided consent can be obtained from the Regional Council.

The systems standby water storage capacity is limited to what the reservoir and the tanks sited on those rural properties connected to the scheme can provide. It is a Council requirement that rural water tanks must be capable of storing the 24 hour calculated volume from which the property is to be supplied.

The reservoir holds 270m<sup>3</sup> of water. The farm tanks and the two concrete tanks at the SH4 and Whakapapa Road intersection together provide an additional storage capacity of about 500m<sup>3</sup>. The total storage of about 800m<sup>3</sup> does not meet the target levels of service required to ensure continuity of supply and for fire fighting. An additional 270m<sup>3</sup> reservoir is required to meet the target of minimum 1-day storage in the system.

The water supply system was apparently never designed for fire fighting purposes and hydrants were incorporated into the urban reticulation as an afterthought. The flow of water appears to be sufficient for fire fighting though, as a major fire at the Owhango Hotel in June 1984 saw the brigade successfully using five hoses to quell the blaze.

The scheme is relatively new and, therefore, leakage is not considered a problem in the distribution system.

**(b) Future Demand**

There has been a steady increase in demand over recent years with the establishment of a number of dairy farms to the north of Owhango. However the treatment plant's capacity is considered to be adequate to cater for any increase in demand over the period covered by this report.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the Owhango Township:

- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access).
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

There have been a number of incidents of communicable diseases recorded from the Owhango area by the Waikato District Health Board. The community are considered to be at risk of contracting water borne diseases from drinking inadequately treated water.

**(d) Options to Address Future Demand and Public Health and Environmental Issues**

The following options have been developed to address or mitigate the issues and risks associated with this system include:

- Construction of an additional 270m<sup>3</sup> capacity service reservoir,
- Installation of high/low reservoir level early warning system at the treatment plant site and unsealed access road to the treatment plant site.
- Construction of a full conventional water treatment plant and access road at existing site commencing 2008/09.
- Undertake an education campaign on how to reduce the risks to consumers of this water supply scheme.

**(e) Preferred Council Response**

Council signalled in the Future Ruapehu Long Term Plan 2004-2014 that it intended to upgrade the Owhango water supply scheme to ensure that the water provided complied with anticipated changes to drinking water standards. The works stated above will ensure that these standards can be met. If the anticipated standards and legislative changes do not eventuate Council will re-evaluate its position.

It is recommended that council undertake a community education programme to increase public awareness of water borne diseases and methods to eliminate these risks, such as boiling all drinking water, filtration, and regular storage tank cleaning and maintenance.

The New Zealand Waste and Water Association have recently produced a booklet titled 'The Story of Drinking Water' which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that this booklet be provided to all properties that are connected to the Owhango water supply scheme.

### **6.7.2 Sewerage**

#### **(a) Services Provided in Owhango Township**

There is no Council operated sewage system either in the Owhango township itself or the surrounding rural area. Sewage from the numerous dwellings, the school, the hotel, lodges, various businesses and rural properties bordering the township is treated by individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

#### **(b) Future Demand**

The population of Owhango has increased slightly over the last few years and this trend could be expected to continue during the period covered by this report. Consequently it is expected that there will be some increase in discharge of sewage effluent to ground.

#### **(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process which is provided in Appendix 1, there were no issues identified for the on-site treatment and disposal of sewage which attracted a profile of 6 or higher

Data supplied by the Waikato District Health Board covering the period since 1999, indicates that there have been a number of cases of communicable diseases from the Owhango area. However the risk to public health is considered negligible due to the relatively low population density of the area.

#### **(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – no Council involvement,
- Undertake and education campaign on the importance of maintaining septic tanks.

**(e) Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, such as regular cleaning. Increase public awareness will assist in reducing both the environmental and public health risk from the disposal of sewage to ground.

The New Zealand water and waste association have recently produced a booklet title 'The Story of Your Septic Tank' which gives a 'hands on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet be provided to all properties that currently dispose of their wastewater through a septic tank system.

**6.7.3 Stormwater**

**(a) Services Provided in Owhango Township**

The stormwater system in the Owhango Township consists mainly of roadside drains as well as open stormwater drains and culverts under roads that have been constructed to convey stormwater and discharge to natural watercourses. Council has generally not maintained the natural watercourses.

**(b) Future Demand**

It is not anticipated that the existing stormwater network will be expanded to any extent. However it is expected that as the population of the township increases that there will be a community expectation that the current system of open drains within the township should be piped.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process which is provided in Appendix 1, there were no issues identified for the disposal of stormwater which attracted a profile of 6 or higher

It is not considered that the current reticulated system, open drains, culverts or natural watercourses present a significant public health risk.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

Whilst the above risk analysis has not highlighted any significant risks in relation to this service, the following options have been developed to address potential public concern with the current system of open drains:

- Status quo,
- Piping of all open drains,
- Increased maintenance of natural watercourses.

**(e) Preferred Council Response**

As the current stormwater network in Owango creates no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

**6.8 WATER SERVICES - RURAL SETTLEMENTS/SCHOOLS****6.8.1 Water Supply**

Raurimu is the only rural settlement located in the National Park Ward, situated adjacent to State Highway 4 approximately 35km southeast of Taumarunui. There are three schools in the National Park Ward, Owango, Kaitieke, and National Park. As the schools at Owango and National Park are located within the respective townships and services to those towns has already been discussed, Kaitieke is the only school that will be discussed in this section. The Kaitieke School caters for approximately 11 pupils.

**(a) Services in the Raurimu Community**

Water for the community supply is obtained from a tributary of the Makuretu Stream and some properties also collect rainwater off the building's roofs or a combination of the two. These sources are not graded by the Ministry of Health and do not receive any form of treatment prior to distribution apart from the community supply which is chlorinated prior to disinfection.

The flow at the source is ungauged but would appear sufficient to supply the community that is currently connected to this supply. Tank supplies generally appear to be adequate for dwellings relying on this form of supply.

The water supply source is ungraded by the Ministry of Health however the community committee responsible for the water supply takes water samples, which are tested, at an accredited laboratory. From the draft Annual Review of Drinking Water Quality produced by the Ministry of Health, the supply did not achieve bacteriological or protozoan compliance for the 2003 year. Although water obtained from these sources may be considered to be potable, it is evident that the sources do not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS: 2000). Community education on the risks associated with the water supply and improved maintenance of water storage tanks is recommended.

**(b) Service provided in Rural Schools**

There is only one school within the National Park Ward situated in an isolated location away from any other significant community. This school is located at Kaitieke and caters for around 11 pupils.

**Water Source**

According to the *2003 Edition of the Register of Community Drinking Water Supplies in New Zealand*, the Kaitieke School is supplied from the Kaitieke School Spring.

### Quantity

The flow from the Kaitieke School spring is ungauged but is reported as being sufficient to supply the school's needs.

### Quality

The source is ungraded by the Ministry of Health and is untreated prior to distribution. From data supplied by the Waikato District Health Board covering the period since 1999, there have been no reported cases of communicable diseases from the area serviced by this rural school.

The school takes water samples, which are tested, at an accredited laboratory. However from the draft Annual Review of Drinking Water Quality produced by the Ministry of Health for 2003, the school did not achieve bacteriological or protozoan compliance for the 2003 year. Although water obtained from these sources may be considered to be potable, it is evident that the sources do not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS: 2000). Community education on the risks associated with the water supply is recommended.

### **(c) Future Demand**

The exact population of Raurimu is unknown and although it is considered to have remained reasonably stable over previous years, it is expected to increase slightly with increased development in the area during the period covered by this report. Consequently it is expected that there may be an increased demand placed on the water supply.

It is not expected that the demand for water from the source supplying Kaitieke School will increase to any extent over the period covered by this report. Assuming the school's roll does not increase significantly, the supply should be adequate for future requirements.

### **(d) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the Raurimu and Kaitieke communities:

- Contamination of the water supply at the source,
- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access),
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

These communities are considered to potentially be at risk of contracting water borne diseases from drinking inadequately treated water.

**(e) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with these water supplies include

- Undertake a community education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.
- Status quo – No Council involvement.

**(f) Preferred Council Response**

It is recommended that Council undertake a community education programme in both Raurimu and Kaitieke to increase public awareness of water borne diseases and the importance of appropriate water treatment.

The New Zealand Waste and Water Association have recently produced a booklet titled 'The Story of Drinking Water' which provides information on the risks associated with small water supplies and the best methods to manage these risks. It is recommended that this booklet be provided to all properties that rely on these water supplies for drinking water.

**6.8.2 Sewerage**

**(a) Services Provided in Rural Settlements and Schools**

There is no Council operated sewage system in these communities. Sewage from the numerous dwellings and school within these communities is treated by individual on-site septic tanks and effluent disposal to ground by means of soakage fields.

**(b) Future Demand**

The population of Raurimu has increased slightly over the last few years and this trend could be expected to continue during the period covered by this report. Consequently it is expected that there will be some increase in discharge of sewage effluent to ground. However this increase is not considered to be significant.

It is not expected that loadings on the Kaitieke School sewage system will increase significantly over the period covered by this report consequently it is no expected that there will be any significant increase in discharge of sewage effluent to ground.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified for the on-site treatment and disposal of sewage that attracted a profile of 6 or higher.

According to data supplied by the Waikato District Health Board covering the period since 1999, there have been no reported cases of communicable diseases from the Raurimu area and consequently the risk to public health is considered negligible.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

Although risk analysis has not highlighted any significant risk in relation to this service, the following options have been developed to address any potential future issues:

- Status quo – No Council involvement,
- Undertake and education campaign on the importance of maintaining septic tanks.

**(e) Preferred Council Response**

It is recommended that council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, such as regular cleaning. Increase public awareness will assist in reducing both the environmental and public health risk from the disposal of sewage to ground.

The New Zealand Water and Waste Association have recently produced a booklet titled 'The Story of Your Septic Tank' which gives a 'hands on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet is provided to all properties that currently dispose of their wastewater through a septic tank system.

**6.8.3 Stormwater****(a) Services Provided in Rural Settlements and Schools**

The stormwater system in the Raurimu Township consists mainly of roadside drains as well as open stormwater drains and culverts under roads that have been constructed to convey stormwater and discharge to natural watercourses. Council has generally not maintained the natural watercourses.

There is no formal stormwater discharge system at the Kaitieke School. Stormwater from the school building and adjacent surfaced areas is discharged via natural overland flow paths to adjacent creeks or waterways.

**(b) Future Demand**

It is expected that there will be a requirement to upgrade and pipe existing open drains within the Raurimu Township as well as the continued maintenance of the existing stormwater network.

Due to the absence of any expected expansion at the Kaitieke School, it is not expected that the existing stormwater system will need to be expanded.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage collection and treatment schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified in this category for the stormwater networks discussed.

Although analyses has not highlighted any significant risks in relation to the stormwater service provision in Raurimu it is likely that their will be growing community pressure to upgrade and pipe existing open drains.

It is not considered that the current reticulated system, open drains, culverts or natural watercourses present a significant public health risk.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

Although risk analyses has not highlighted any significant risk in relation to this service, the following options have been developed to address potential community concern with stormwater disposal:

- Increased or improved maintenance of open drains,
- Piping of all open drains,
- Status quo.

**(e) Preferred Council Response**

As the current stormwater network in these rural settlements provide no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

**6.9 WATER SERVICES AND PUBLIC TOILETS AND SOLID WASTE – NON-COUNCIL SUPPLIED SERVICES**

**6.9.1 Introduction**

The Department of Conservation administered Tongariro National Park and other public reserves make up a significant proportion of the National Park Ward. The Department and those businesses located within the national park

provide water and sanitary services to visitors, customers, and staff. Council does not provide any services within the Tongariro National Park.

As Council is required in this assessment to provide information on non-council operated facilities, Council contacted the department of Conservation Turangi Conservancy for information on services located within the National Park. No information had been received from the department at the time of writing this Assessment.

The following information is information currently held by Council on two settlements, Whakapapa and Iwikau Villages, located within the Park

### **6.9.2 Public Toilets**

**(a) Inventory**

The Department of Conservation owns and operates three public toilet facilities in Whakapapa Village. There are 11 pans and two single wall mounted urinals. One facility has disabled toilet facilities.

**(b) Future Demand**

There is no intention to increase the number of public toilets in Whakapapa Village

**(c) Risk Assessment**

There is no risk identified from Public Toilets in Whakapapa Village.

**(d) Identified Issues**

Routine servicing and maintenance

**(e) Options for addressing Issues**

Continued ownership and operation by Department of Conservation.

### **6.9.3 Solid Waste Disposal and Recycling**

**(a) Inventory**

The Department of Conservation provides solid waste and recycling facilities to both Iwikau and Whakapapa Villages. The systems comprises of twelve 3.5 m<sup>3</sup> and six 4.0 m<sup>3</sup> front loading bins. A front loading compacting truck with 25m<sup>3</sup> capacity. The recycling depot operates as both a transfer station with a "hole in the wall" style recycling access. Bulk recyclables coming from the ski area and Château Tongariro are provided for with commercial access to the recycling building. Both Whakapapa and Iwikau villages together produce approximately 4400 m<sup>3</sup> of solid waste. Recycling was reintroduced in 2003/04 after community demand for the service. In the first year of operation 12% of product was recycled. This is expected to increase as the true cost of waste disposal becomes better known and applied to the consumer.

**(b) Future Demand**

The Department of Conservation has adopted both the New Zealand Waste Strategy and the Ruapehu District's strategy Towards Zero Waste. Future demand for waste services will be minimised through waste minimisation initiatives while support for recycling will increase.

**(c) Risk Assessment**

The risk is that there could be increased waste volumes with a rise in Tourism, and also increased recyclable volumes.

**(d) Identified Issues**

There is a need for a transfer station and recycling depot at Iwikau Village.

**(e) Options for addressing Issues**

Planning is now underway with the community for a new facility at Iwikau Village to service the ski area and club huts. This will relieve congestion at the Whakapapa Village transfer station. Costs are expected to continue to increase as Councils pass on compliance costs and as the true cost of land disposal become better known. Recycling and waste minimisation are the only opportunities for contributors to limit exposure and the departments funding model will reflect the efforts made by each contributor.

**6.10.1 WATER SUPPLY SERVICES**

**6.10.2 Whakapapa Village**

Whakapapa Village is situated on State Highway 48 approximately 16km from National Park Village at the base of Mt Ruapehu and consists of tourist accommodation, Department of Conservation facilities, Ruapehu Alpine Lifts and visitor facilities. Council does not operate or maintain this water supply service.

The original Whakapapa village water supply came from the Whakapapanui stream at lodge clearing and was constructed in 1929 in conjunction with a hydroelectric generating plant. This was part of the Chateau Tongariro construction project that was being carried out by the Tongariro National Park Tourist Company at that time.

When Mt Ruapehu erupted in May 1945 the Whakapapanui Stream became contaminated by lahar and ash. The pH of the water fell to 4.0 making the supply unfit for use. Ruapehu continued to erupt sporadically until 1947 with ash fallout to the stream causing problems with water and electricity plants.

In 1953 the Whakapapanui intake was abandoned in favour of the present supply from Joes Creek. This creek is a tributary of Waipuna Stream that is relatively isolated and not subject to lahars. Originally there was a simple weir with a cage filter over the inlet pipe. Water was piped down to a holding tank in Lodge Clearing. From there it was piped to Whakapapa Village for distribution.

A new AC water main and reservoir at the top of lodge clearing was constructed in the early 1950's. The original reservoir and village main were retained and dedicated to the Chateau fire sprinkler system. In 1977 the Tourist Hotel Corporation handed control of the supply to Tongariro National Park Board. In the intervening years connections had been added to private huts in Lodge Clearing, Ruapehu Alpine Lift's staff accommodation, Skotel, and a number of Park Board residences.

In 1980 the weir was modified to its present configuration by the addition of a sluice gate, and coarse filters through the wall of a chamber from which the supply is collected. Presently no other form of treatment is applied to the

system although it is accepted that minor sedimentation does occur at the reservoir.

Today the supply is run by the Department of Conservation, under the umbrella of its community service functions, who evolved from the restructuring of the Tongariro Park Board and a number of other government conservation agencies. In 1992 the Department employed consultants Snow Engineering to conduct a system assessment and treatment feasibility study. The recommendations of their report have been addressed in this document.

Ruapehu District Council were approached in 1995 with regard to taking responsibility for the supply. This option was considered by the Ruapehu District Council and was not dismissed, but declined until deferred maintenance and some upgrading occurred.

**(a) Inventory**

The Department of Conservation operates potable water supply to Whakapapa Village, Mt Ruapehu. The treatment facility is designed to meet the NZDWS 2000 and comprises of a raw water intake structure on Joe's creek (a tributary of the Waipuna stream), and 800m of 150mm HDPE raw water pipeline to the water treatment plant. The treatment plant processes are sand and micro cartridge filtration followed by disinfections using mixed oxidants generated from washed salt. Drinking water is stored in a new (2002) 300m<sup>3</sup> timber tank reservoir and a 240 m<sup>3</sup> concrete reservoir which was built in 1953. The plant produces about 240m<sup>3</sup> of drinking water per day and services a design population of 1200 person equivalents.

The distribution zone comprises of a 200mm cement gravity trunk main of approximately 1066m followed by 1400m of 100mm lateral branch mains of spiral steel and galvanised pipe.

**(b) Future Demand**

Future demand is limited to a design population of 1200 people by the Tongariro National Park Management Plan. A new management plan will become operative in 2005, which will maintain this carrying capacity for a further 10 years. The current treatment plant is designed to cater for the current demand without provision for future increase.

**(c) Risk Assessment**

The risks have been identified as a loss of raw water supply pipeline at Whakapapanui Stream, Power failure and distribution zone failure.

**(d) Identified Issues**

Draft Drinking Water standards 2005 propose to improve confidence in drinking water supplies. In this plant it is expected that additional monitoring equipment and minor equipment upgrades will be required.

The raw water pipeline, at the point where it crosses the Whakapapanui is at risk of being washed away in a flood event or volcanic lahar. This section of pipeline is designed to break free and can be reinstated within a very short period of time. It is expected that the stored water (reservoir) capacity is

sufficient to ensure continuity of supply if this event occurred. The details of this response are document in a Civil Defence Contingency Plan for Whakapapa Village Water supply.

The asbestos cement and spiral-welded pipes generally appear to be performing satisfactorily. However the galvanised iron pipes are in a very poor condition and have generally exceeded their serviceable life because of the aggressive soil conditions. These galvanised iron pipes should be programmed for replacement in the next five to ten year period.

#### (e) Options for addressing Issues

The 1999 Asset Management Plans focused on the intake and treatment plant, this phase has been implemented with a formal reviewed of the plan completed in 2004. The focus for the next planning period will be renewal of underground pipelines in the distribution zone. See table below.

Item	Network	Comment	Life Expectancy	Replacement Cost
1	Main trunk	Reinstate full pipe support	20 & 5	\$190,000
2	Chateau	Monitor and maintain	10	\$25,000
3	Holiday Park	Programme replacement	5	\$7000
4	Tawera Place	Programme replacement	5	\$4000
5	Ngauruhoe Place	Monitor and maintain	15	\$25,000
6	Hepi Terrace	Programme replacement with street upgrade	10	\$6,500
7	Tavern branch		30	\$9,500
8	SH 48 Crossings	Programme replacement	6	\$6000
9	Other		5-50	\$45,000
			<b>Total</b>	<b>\$320,000</b>

#### 6.10.3 Sewerage

A recently installed system collects sewage from all facilities located in the Iwikau Village located at the top of the Bruce Road. These facilities previously treated sewage on-site by means of individual septic tanks and ground disposal via soakage fields. Collected sewage is now piped down the mountain to join the existing reticulated system in the Whakapapa Village, treated at the upgraded sewage treatment plant and treated effluent discharged to ground via subsurface drip lines.

#### (a) Background

The Department of Conservation operates a waste water treatment plant WWTP serving both Iwikau and Whakapapa Village. The WWTP consists of a series of mechanical and biological treatment processes. Treated effluent

from the treatment plant flows through an irrigation system before discharging into land. This discharge replaces a single point discharge to water and began operating in 2004. The WWTP is located in Whakapapa Village Amenity Area SH 48 Mt Ruapehu.

The WWTP is designed to serve a population of 6000 day visitors and 2600 population equivalent overnight visitors. This equates to about 700m<sup>3</sup> of waste water per day at peak times.

The WWTP was upgraded in 2004 and is currently operated under a short term discharge permit for the construction period, issued by Horizons Regional Council. This expires in December 2005 at which time a new permit will be issued for a twenty-year term

## **(b) Inventory**

### The Reticulation

Reticulation can be split into four main sections.

- 1 Wet wells & Rising mains- Iwikau Village
- 2 Gravity Sewer Reticulation - Iwikau Village
- 3 Conveyance Pipe - Iwikau to Whakapapa
- 4 Whakapapa Village Gravity Sewer reticulation

### Wet wells and Rising Mains

There are four wet well pumping stations servicing parts of Iwikau Village sewer reticulation. These stations were installed in 2004 and are now operating under routine maintenance and inspection regimes. In all cases the wet wells pump up to gravity sewers.

### Gravity Sewer Reticulation and Conveyance- Iwikau – Whakapapa Village

The pipes are laid alongside tracks and roads wherever possible, both to provide ease of installation and for maintenance/inspection access. Using road minimises damage to the native environment within the National Park as this portion of land area is already modified. A combination of 100mm and 160mm pipe sizes have been selected to be in excess of estimated peak flows to take account of system maintenance. A 240m<sup>3</sup> storage tank installed at Iwikau Village allows approximately 24 hours of sewage retention for maintenance shut down periods, a flushing chamber for low flow times of the year is used to flush the sewer pipelines reducing the chance of pipe blockages.

### Whakapapa Village Gravity Sewer reticulation

Sewers in Whakapapa village range in age from the early 20's to today. The sewer mains are 100 and 150mm A/C to 280mm concrete over 4500m. Recent CCTV inspection, subsequent renewal and maintenance of the pipeline has provided a secure sewer reticulation network for Whakapapa Village

## The Treatment Plant

The 2004 upgrade of the Whakapapa sewage treatment plant is located within the existing site inside the amenity area of Whakapapa Village. The treatment uses natural processes to degrade raw sewage, which will allow the final effluent to be safely assimilated into the environment. The process is subject to severe seasonal fluctuations, where the winter ski season provides the greatest loading at a time when treatment capabilities will be at or close to their lowest. Allowance has been made in the design to manage the effluent treatment over this period and to ably release it after it has been subjected to additional Ultra Violet disinfection. The treated effluent will then be discharged to ground via a 5000m-irrigation network.

### Treatment System and Disposal Components

The upgraded treatment system and disposal system comprises of: -

- Upgraded activated sludge (AS) basin, which provide treatment ready for clarification.
- Two clarifiers.
- Effluent dosing tank prior to discharge to disposal fields.
- Solids filtration systems.
- Ultra Violet disinfection.
- Soakage to pumice layers over the former pig farm and airstrip site using buried dripper lines and irrigation trenches.
- Waste solids storage in sludge bags called Geotubes for use as a biosolid and applied to land.

### **(c) Future Demand**

Future demand is limited to the present design population by the Tongariro National Park Management Plan. A new management plan will become operative in 2005 which will maintain this carrying capacity for a further 10 years. The current treatment plant is designed to cater for the current demand without provision for future increase. One additional connection is planned for 2005 which is the Knoll Ridge café operated by Ruapehu Alpine lifts Ltd. This is unlikely to require additional treatment capacity at the plant.

### **(d) Risk Assessment**

Known risks to safe operation of the system include:

- Sewer blockage within ski area
- Power outage causing pump and plant failure
- Significant reticulation failure Whakapapa Village
- Irrigation field saturation over time

**(e) Identified Issues**

Whakapapa village sewer network is old and will require a staged approach to renewal. Complete CCTV surveys have been completed and urgent renewals completed in 2004.

**(f) Options for addressing Issues**

Staged renewal of sewers will be required over the next 20 years.

**6.10.4 Iwikau Village**

**6.10.5 Water Supply**

**(a) Services Provided in Iwikau Village**

Iwikau Village is located on Mt Ruapehu at the top of the Bruce Road approximately 6km above Whakapapa Village. The Village consists of a number of ski lodges and Ruapehu Alpine Lifts skier facilities.

Water is obtained from rain or snowmelt off the buildings. The Ministry of Health does not grade these sources and it is not known as to whether the water receives any form of treatment prior to distribution.

Tank supplies are assumed to be adequate for dwellings relying on this form of supply.

These water supplies are ungraded by the Ministry of Health. Although water obtained from these sources may be considered to be potable, it is evident that the sources do not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS: 2000). Community education on the risks associated with the water supply and improved maintenance of water storage tanks is recommended.

**(b) Future Demand**

It is understood that there is limited scope for further development within the existing Iwikau Village and hence it is assumed that the existing supplies will be adequate for the needs of the users of the various facilities during the period covered by this report.

**(c) Risk Assessment**

There is a potential for users of the facilities at Iwikau Village to be at risk to contracting water borne diseases from drinking untreated water.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

It is recommended that a community education programme be undertaken to increase public awareness of water borne diseases and methods to eliminate these risks, such as boiling all drinking water, filtration, and regular storage tank cleaning and maintenance.

The New Zealand Waste and Water Association have recently produced a booklet titled 'A Story of Drinking Water' which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that this booklet is made available to all those who live or work within these villages and also at all accommodation facilities located in the Tongariro National Park.

#### **6.10.6 Sewerage**

A recently installed system collects sewage from all facilities located in the Iwikau Village located at the top of the Bruce Road. These facilities previously treated sewage on-site by means of individual septic tanks and ground disposal via soakage fields. Collected sewage is now piped down the mountain to join the existing reticulated system in the Whakapapa Village, treated at the upgraded sewage treatment plant and treated effluent discharged to ground via subsurface drip lines.

### **6.11 WATER SERVICES - MARAE**

#### **6.11.1 Services Provided in Marae**

There are eight marae spread throughout the National Park Ward, marae recorded in the 2001 census are listed in Appendix 4. Council does not currently have any information relating to the provision of Water Services to the marae that are not connected to Council systems.

##### **(a) Water Supply**

It is assumed that as most of these marae are in rural areas, water is obtained from nearby springs, bores or collected off roofs of marae buildings and stored in tanks on site.

##### **(b) Sewerage**

It is assumed that where a particular marae is not connected to the Council sewage system, sewage is disposed of by means of on-site septic tanks and effluent disposal to ground by means of soakage fields.

##### **(c) Stormwater**

It is envisaged that stormwater from the marae building roofs and surfaced areas would be discharged to ground via natural run-off patterns where no formal stormwater discharge system exists.

#### **6.11.2 Future Demand**

Due to their very nature, there will always be a fluctuating demand placed on the water services for marae. There may be periods where there is little or no activity, and other times where the water supply and sewage disposal systems may be under considerable 'load'. The capability of the relative systems' ability to cope under these circumstances will depend on their original design and construction and how they have been developed and maintained over time.

### **6.11.3 Risk Assessment**

It is considered that water services associated with rural marae could potentially present a significant public health risk due to the ability (or lack thereof) at times to supply large groups of people with untreated drinking water which may have been stored for some time and could be at risk to being contaminated, as well as sewage systems that may not be able to cope with peak loadings.

### **6.11.4 Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks association with the provision of water services to marae include:

- Status quo – No Council involvement,
- Undertake and education campaign on the importance of maintaining septic tanks,
- Undertake an education campaign on how to reduce the risks of water supplies of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

### **6.11.5 Preferred Council Option**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, and increase public awareness of water borne diseases and method sot eliminate these risks. Increased public awareness will assist in reducing both the environmental and public health risks from these services.

The New Zealand Water and Waste Association have recently produce two booklets titles 'The Story of Your Septic Tank' which gives a hands on approach to the operation, care, and maintenance of septic tanks and 'The Story of Drinking Water', which provides information the risk associated with small water supplies and the best methods to manage these risks. It is recommended that these booklets be provided to all marae that currently dispose of their wastewater though a septic tank system and/or source and provide their own water supply.

## 7.0 WAIMARINO WARD

### 7.1 INTRODUCTION

7.1.1 The Waimarino Ward is the Southern most Ward of the Ruapehu District with a population of 3,546 as at census night 2001, and an area of 2,120km<sup>2</sup>, making it the Ruapehu's largest ward by area and second largest ward by population. Winstone Pulp International Ltd pulp and paper and sawmill is a major employer in the towns of Raetihi, Ohakune and Waiouru.

7.1.2 Key statistics for the Waimarino Ward are provided in the following table.

<b>Waimarino Ward - Key Statistics</b>	
Population	3,546
Area	2,120km <sup>2</sup>
Number of water supply connections	1,803
Number of properties on metered supply	69
Number of rateable properties	2,692
Main industry	Agriculture / Horticulture / Tourism
Possible growth industries	Tourism
Townships	Ohakune, Raetihi, Rangataua, Pipiriki
Number of Schools	

Table 15: Waimarino Ward Key Statistics

## 7.2 SETTLEMENTS

### 7.2.1 Ohakune Township

There are four main settlements in the Waimarino Ward. The largest of these settlements is Ohakune. Ohakune is a medium sized town that has developed based on servicing the surrounding industries of farming, milling, market gardening, tourism, and the Turoa Ski Fields.

The Town has a usually resident population of 1,293 as at the 2001 census, a reduction of 96 (-6.9%) from the 1996 census. However this population more than triples during peak periods of the winter ski season to between 3,000-4,000.

The median income of people in Ohakune is \$18,100, compared with \$16,700 for the District as a whole and \$18,500 for all of New Zealand.

Ohakune Township is one of the few towns within the District experience growth and development. This is evidenced by the continuous growth in the number of both resource and building consents issued by Council for this area. During peak winter periods visitors to the Turoa Ski Fields (20mins from Ohakune) may number upwards of 3,000 in one day. Ruapehu Alpine Lifts

have indicated that they intend to concentrate on more than doubling this daily visitor figure.

### **7.2.2 Raetihi Township**

The second largest township in the Waimarino Ward is Raetihi. Raetihi is located on the western edge of the Waimarino Plains in the southern part of the Ruapehu District, 80km south of Taumarunui and 11km west of Ohakune. The census usually resident population for Raetihi was 1,068 in 2001, a reduction of 99 (8.5%) since 1996. The median income of Raetihi residents is \$14,300, compared with \$16,700 for Ruapehu District and \$18,500 for all of New Zealand.

Raetihi is primarily a service town for the predominant industries in the area of Mill Agriculture and Horticulture. However due to the towns proximity to the tourist town of Ohakune and the Mount Ruapehu Ski fields it is likely that tourist operations in the town will increase in the future.

### **7.2.3 Urban Settlements**

There are two other settlements in the Waimarino Ward, namely Pipiriki and Rangataua.

Pipiriki is located west of Raetihi and is a small relatively isolated community. Pipiriki is the site of numerous important cultural, historical, and environmental attractions and as such attracts many tourists. Pipiriki is one of the three main gateways to the upper section of the Wanganui River. It is a popular access and egress point for those who enjoy the many river activities offered. These activities include jet boat tours to popular sight seeing attractions and canoe trips along the river itself.

Rangataua is a small township located south of Ohakune Rangataua is a small rural settlement situated between State Highway 49 and the North Island Main Trunk Line, approximately 5km south east of Ohakune. The settlement comprises of approximately 113 dwellings, a hall and a closed school.

## **7.3 CEMETERIES**

### **7.3.1 Services within the Waimarino Ward**

#### **(a) Urupa (Maori Tribal Cemeteries)**

From the information available it is known that there are five Urupa situated within the Waimarino Ward.

#### **(b) Cemeteries**

There are three public cemeteries in the Waimarino Ward, Raetihi, Ohakune, and Rangataua.

Rangataua cemetery is an open cemetery. The Raetihi and Ohakune cemeteries are partial open (old sections) and partial berm sections. There is mechanical mowing at all three cemeteries. Sheep graze the open developed

areas, and the undeveloped area at Ohakune. Sheep or deer graze the undeveloped area of the Rangataua cemetery.

The estimated life span of these three cemeteries ranges between 25 -1000+ years. More detailed information is provided in the table below.

Cemetery	Location	Area (ha)	Current and Estimated Future Burials / Year	Estimated Life (years)
Raetihi	Makotuku Valley Road	2.9006	10	25
Ohakune	Lakes Road	4.8302	10	500
Rangataua	Ratamarie Road	2.8682	1	1000+

Table 16: Estimated life span of cemeteries

### 7.3.2 Demand Projections

Demand for the Raetihi and Rangataua cemeteries is predicted to remain steady. Demand for the Ohakune cemetery is predicted to increase slightly. Although considerable development is predicted to occur in Ohakune, the majority of this is attributed to holiday homeowners and tourist accommodation facilities, which are not predicted to affect burial numbers.

### 7.3.3 Risk Assessment

A risk assessment has been carried out on the cemetery service provided within the Waimarino Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Waimarino Cemetery services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

### 7.3.4 Options to Address Future Demand, Public Health, and Environmental Issues

It will be necessary to consider the inclusion of some of the Council owned land either side of the Raetihi Cemetery into the operational area to provide increased capacity within the next five to ten year period. The sloping ground above the Mankotuku River could provide further capacity to the existing cemetery subject to suitable ground stability tests being carried out.

There is no known public health or environmental issues arising from Waimarino Cemeteries.

## 7.4 PUBLIC TOILETS

### 7.4.1 Services within the Waimarino Ward

There are three public toilet facilities in Ohakune, two facilities in Raetihi and one in Pipiriki. There are also public toilet facilities at the Ruatiti Domain, comprising four 'long drop' units and one water serviced units.

#### (a) Ohakune Township

The Ohakune toilets are located in Clyde Street on State Highway 49 in Jubilee Park, on Conway Street near the playground in Christie Park and in the Ohakune Railway Station in Thames Street. The Clyde Street and Conway Street toilets are open 365 days per year, 24 hours per day. The Railway Station toilets, which are being reconstructed following fire damage, comprise two unisex units, one of which is planned to be a disabled unit. These toilets will be open 365 days per year, however consideration is currently being given to opening only during daylight hours due to the amount of vandalism sustained to the previous facility during the darkness hours. There are also no longer any night passenger trains on the main trunk line.

There is a Department of Conservation flush public toilet facility located at the base of the Ohakune Mountain Road which is also open 24 hours 365 days per year. There are a number of toilet facilities located at the Turoa ski area, which cater for skiers in the winter. These facilities are closed outside of the ski season.

Ohakune has one petrol station with a toilet facility that caters for its customers. There are numerous cafes and restaurants and two hotels, which provide toilet facilities for their customers.

#### (b) Raetihi

In Raetihi there is a public toilet facility in Seddon Street and a very small public toilet facility in Parapara Road, State Highway 4 located on reserve land beside the Raetihi Swimming pool complex. Both facilities are old. The Seddon Street facility is located in what was the Raetihi Plunkett Rooms. The Parapara Road facility was purpose built but is estimated to be approximately 75 years old. This facility is the last public toilet on State Highway 4 before Wanganui, approximately 1.5 hours drive away.

Raetihi has one petrol station, not open 24 hours per day, two small cafes open for limited daily hours, and one hotel, all of which cater for their customers. One cafe is a bus stop destination and caters for those bus traveller's needs.

The Parapara Road facility is well used by travellers on the Raetihi-Wanganui route and Ruapehu District Council has included replacement of this facility with a larger modern facility in the Future Ruapehu Long Term Plan 2004-2014, with a target construction date of 2011.

The public toilets are open 365 days per year, the State Highway 4 toilets 24 hours per day, the Seddon Street toilets approximately 8 hours per day.

**(c) Ruatiti Domain**

This is a popular remote recreation reserve located on the Manganui O Te Ao River. Free camping is allowed in the reserve and to provide facilities for campers as well as day picnickers and fishermen, two modern “long drop” units that include sealed disposal tanks and soakage systems have been installed over the past six years. A two-stall flush toilet facility is located near the main camping area, which has a septic tank and soakage pit disposal system. All holding tanks are cleaned on a regular basis.

**(d) Pipiriki**

There is a combined public toilet and public shelter facility at Pipiriki Township located on Department of Conservation land. Council built the facility with a financial contribution from the Department and Council has a concession (type of lease) of the land. The facility is considered Council owned and is maintained by Council. During the summer canoe season, use is high from canoeists and their support persons. There is a small amount of use through the winter by visitors and tourists travelling the Wanganui Raetihi route via Pipiriki. The facility was built in 1999 and is the newest public toilet facility in the District. The Wanganui River road is due to be tarsealed in the near future. Use of the toilet facility is expected to increase when the road has been sealed. Water supply to the facility may become an issue if use increases significantly. Water is currently reticulated from a spring source.

**(e) Department of Conservation Facilities**

The department of Conservation provides public toilet facilities on conservation land. The following information has been received from the Department of Conservation Whanganui Conservancy.

Location of Public Toilets

Public Toilets are located:

- Along the Mangapurua Track at: Battleship Bluff, Bettjeman’s House Site, Johnson’s House Site, and Mangapurua Trig.
- 2 pit toilets are provided at Whakahoro Hut. These pit toilets will be replaced with containment vaults during the 2005/06 year.

**7.4.2 Demand Projections**

Generally there is predicted to be a slow but steady increase in the number of tourists visiting or travelling through the townships of Ohakune and Raetihi. This increase is expected to consequently increase demand for public toilet facilities in the Waimarino.

**(a) Non-Council Facilities – Department of Conservation (Whanganui)**

Currently visitor numbers in the Mangapurua (with the exception of the lower valley i.e. near the Bridge to No Where) are very low and therefore the current pit toilets are considered adequate. There are long term plans to install a pit toilet in the Kaiwhakauka Valley.

### **7.4.3 Risk Assessment**

A risk assessment has been carried out on the public toilet service provided within the Waimarino Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Waimarino public toilet services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

#### **(a) Non-Council Facilities – Department of Conservation (Whanganui)**

In order to minimise the risks from toilet facilities to public health or the environment, the Department's policy for the location of toilets is that all pit toilet holes must be at least 20 metres from:

- Camping shelters,
- The last or previous holes, and
- Any surface water.

### **7.4.4 Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this service include:

- The demolition of the current Clyde Street facility and the construction of a larger facility. In Ohakune it is possible that the Clyde Street facility does not adequately cater for demand at the present time during peak periods i.e. during the ski season and public holiday periods. The demolition of the existing building and construction of a modern, larger facility should be considered in the medium term.
- The development of the Old Coach Road walking track at the north end of Ohakune is predicted to have an impact on demand of public toilet facilities in the areas of the track start and finish where there are currently no public toilet facilities except those located in the Ohakune Railway Station. The construction of additional public toilet facilities would be the only option to address demand arising from this walking track development.

### **7.4.5 Council Preferred Response**

It is proposed that the configuration of public toilet facilities in the Ohakune area be further investigated during the planned review of Council's Recreation and Community Facilities Asset Management Plan in 2006.

## 7.5 SOLID WASTE

### 7.5.1 Services within the Waimarino Ward

#### (a) Transfer Stations

The communities of the Waimarino Ward (Raetihi, Rangataua, Ohakune townships) receive a weekly kerbside refuse collection service on Mondays.

A recycling station is situated at Raetihi, Caltex Service Station. This station provides 24 hr basic recycling service. A “Jack Trash” unit has been placed beside this container forming a mini transfer station. There is also a “Jack Trash” units at the BP Service Station, Ohakune. These units can accept small quantities of residential refuse and can be accessed 24 hours per day..

The Waimarino transfer station services the Waimarino Ward and is situated on Old Station Road, Ohakune. This site accepts all basic and bulk materials for recycling, greenwaste, and residential quantities of hazardous materials

The performance of these sites is affected by the capacity and quality of the asset grounds. The efficiencies of the site are relative to public behaviour in separating their waste into the designated areas. The use of both the Raetihi Recycling Station and Waimarino Transfer Station continues to grow.

Transfer Station	Location	Area (Ha)	Status
Pipiriki	Owairua Road	0.5	This land is rubbish reserve, owned by DOC.
Waimarino	Old Station Road	0.95	This is Council owned land and leased by solid waste.

Table 17: Waimarino Ward Transfer Stations

#### (b) Closed Landfills

There are two consented closed landfills in the Waimarino Ward, Raetihi and Karioi. The Ohakune landfill has also closed and an application for a resource consent has been lodged with Horizons Regional Council. There has been little progress in negotiating this resource consent and this is not anticipated to change until the Ohakune sewage treatment resource consent is completed and attempts have been placed on hold. A resource consent is required for the site.

### 7.5.2 Demand Projections

The transfer stations in the Waimarino will require additional recycling capacity as recycling volumes continue to increase. With the growing demand for recycling facilities, particularly in Ohakune there is pressure for a recycling centre in Ohakune of the same capacity as both that in Raetihi and the BP Taumarunui. As both of the current transfer stations are experiencing capacity problems further resources will need to be allocated to this station before it is built. The Waimarino site will have to expand in order to cope with the recycling volumes in the future.

The recycling station use at Raetihi and Ohakune are predicted to continue to grow as these townships develop. The general public are requesting compost material for sale from this site. This will require a resource consent to be obtained for the facility. The Raetihi Transfer Station is serviced up to two times per day by staff, with the contractor collecting material on a weekly basis from the Service Station storage shed. The capacity at this site is being exceeded and without the option to store material at the garage the site could not function. A formal agreement is required to continue to use this site.

### **7.5.3 Risk Assessment**

#### **(a) Transfer Stations**

A generic risk assessment for larger transfer station sites such as Waimarino has been undertaken. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment.

9 issues have been identified as being potential high risks to larger transfer stations of this type. The risks to this transfer station are lesser due to full time attendance of this transfer station, which allows a greater level of control of material entering the site. The risks presented by this transfer station include:

- Isolation of the site,
- Health and safety issues,
- Capacity for all items onsite,
- Population growth.

The Waimarino Transfer Station is situated on very exposed land and is subject to very high winds. This increases their risk of litter travelling beyond the property boundary. There is a high risk that the Ohakune Township could become isolated from the Taumarunui landfill. In this situation materials could be diverted to the Waiouru landfill in these circumstances.

One path of the Lahar may result in the isolation of Ohakune Township from Waiouru. This would not affect the service to the main townships. WPI may potential be affected however refuse could be bundled and contained within land held by the company until infrastructure can be restored.

#### **(b) Closed Landfills**

The consented landfills have been closed for some years now and monitoring has indicated weak levels of leachate are being generated. Generally older small closed landfills with good capping are benign or “present a low risk to the environment and health in general” (Golder Associates 2002). Ohakune landfill is a recent closure and received a high volume of material. As a recently closed landfill there is a higher risk of stronger leachate. Leachate quality is being monitored. This site does not hold a resource consent and will require one after the resource consent for the Ohakune Sewage Scheme

negotiations are completed. This is reflected in the closed landfill risk assessment

Further information on this risk assessment process is provided as Appendix 1.

#### **7.5.4 Options to Address Future Demand, Public Health, and Environmental Issues**

Some of these risks are mitigated due to staffing of the Waimarino Transfer Station site, however, there is some abuse of the Raetihi Recycling Station and general refuse deposited within the town. During peak population periods a second attendant at the Waimarino Transfer Station will be required. Should the Ohakune recycling centre be established this person would be required sooner to service this site.

Options to reduce the risk at the Waimarino Transfer Station site are to:

- Increase the site capacity. This option could be undertaken relatively easily as Council currently owns the land surrounding the Transfer Station
- Increase the level of staffing at the Site, particularly as the surrounding population increases.

#### **7.5.5 Council Preferred Response**

It is proposed that the issues highlighted above are further investigated during Council's review of the Solid Waste Management Plan in 2006, with implementation of any change in level of service and / or configuration of service scheduled in that Plan.

### **7.6 WATER SERVICES – OHAKUNE TOWNSHIP**

#### **7.6.1 Water Supply**

##### **(a) Services within Ohakune Township**

Ohakune is the largest township in the southern part of the district and is situated on the southern flank of Mt Ruapehu adjacent to State Highway 49 and at the confluence of the Mangawhero and Mangateitei Rivers. The town relies mainly on the winter ski industry but is also the main service centre for the southern area.

##### **Water Source**

The construction of the Ohakune reticulated water supply was completed in February 1962. Water is taken from the Serpentine Stream, a tributary of the Mangawhero River. The intake is sited within the Tongariro National Park.

The Ministry of Health last assessed the supply in 1993, when it was given an *Ed* grading. The *E* grading for the water leaving the treatment plant reflects the situation that despite full treatment being given, the ultra violet disinfection system used cannot guarantee water reaching the consumer is always safe. This is because any contamination that may occur after the treated water

leaves the plant cannot be neutralised. In the opinion of the Ministry of Health, there is a high level of risk to consumers that they will become ill through drinking the water supplied.

The intake on the Serpentine Stream consists of a reinforced concrete weir. The raw water passes through a grating set into the side of the intake chamber and into the 200mm AC raw water main that was laid as part of the original scheme in 1962. The raw water main was diverted to the new water treatment plant in 1992 and consists of sections of 465 metres of 225mm diameter HDPE, and 696 metres of 200mm diameter uPVC pipe.

The Ohakune Water Treatment Plant was the first purpose built protozoa removal plant in New Zealand and was commissioned in 1994. There are two filter trains, each with a depth filter, followed by a diatomaceous earth filter. The depth filters remove suspended particles in the water by contact flocculation, while the diatomaceous earth filters allow filtration down to one micron, which is smaller than the body size of the two common protozoa found in New Zealand waters, giardia and cryptosporidium.

Disinfection is undertaken by ultra violet light. The Ohakune water, under winter storm conditions, can contain organic material that affects the UV intensity. Under such conditions, the UV disinfection unit will not effectively disinfect the water. When this occurs disinfection is undertaken with calcium hypochlorite solution until the UV intensity returns to normal.

The reservoir is a wooden Timbertank structure capable of holding 1,500m<sup>3</sup> of water when full.

The reticulation pressure in Ohakune is very satisfactory with all areas of the reticulation network exceeding the minimum 200 to 300 kPa Target Levels of Service of Ministry of Health guideline value of 250 kPa. Pressures are lowest at higher elevated areas closest to the water treatment plant.

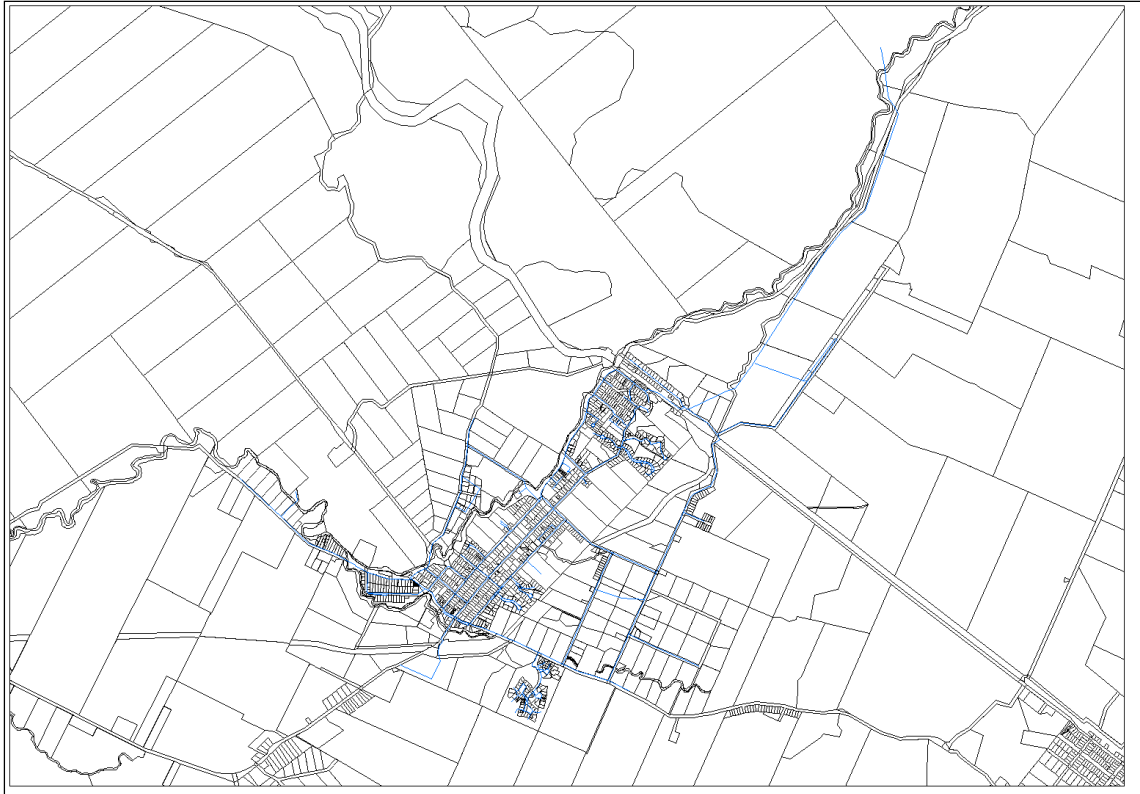


Figure 7: Ohakune Water Supply Infrastructure

### Quantity

The current right to take water expires on 11 September 2025 and allows Council to take up to 2,500m<sup>3</sup>/day from the Serpentine Stream. The current maximum consumption within the township occasionally exceeds 2700m<sup>3</sup>/day, especially during winter months when the consumption due to carrot washing operation and ski season at its peak. The current resource consent recognises the developing situation in Ohakune and provided for reviews of water take in 2005, 2010, and 2015. Due to the rapid development now taking place in Ohakune, it is planned to request the Regional Council review and increase the limit on water take. Some sections of the reticulation are not capable of delivering sufficient water to satisfy the normal demand and fire flows. The situation is made worse when the carrot washers are operating and further aggravated with current ongoing subdivision and development. The seasonal demand together with the current trend of development within the township will put further strain on the available storage capacity to maintain continuity of supply. Additional storage capacity will be required to provide the target levels of service within the next 10 years. The current standby water storage capacity is limited to the capacity of the reservoir that is 1,500m<sup>3</sup>. The average daily demand is also around 1,500m<sup>3</sup>/day, so there is sufficient standby storage to meet 1 day's average demand. This is adequate to provide continuity of supply and for fire fighting.

### Quality

Land in the catchment above the intake is totally within the Tongariro National Park. In theory the catchment is protected. However the presence of faecal

coliforms and giardia lamblia cysts in the raw water indicate that pollution is occurring. Due to deficiencies in the filtration and disinfection processes, the performance of the water treatment plant and therefore the quality of treated water is regarded as poor and hence the grading of E given by the Ministry of Health in 1993.

**(b) Demand Projections**

Ohakune is probably one of the few areas within the Ruapehu District that is experiencing real growth. This will in time place a strain on the existing infrastructure. The water treatment plant will in time require upgrading in order to cope with increased demand. Parts of the existing distribution system are currently unable to provide fire-fighting flows to some areas during times of peak demand. This is currently being addressed with a programme of upgrading sections of the reticulation in order to provide the necessary flows.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the Ohakune Community:

- Failure of the disinfection equipment.
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

There have been a number of incidents of communicable diseases recorded from the Ohakune area by the Wanganui District Health Board. The community are currently considered to be at risk of contracting water borne diseases from drinking inadequately treated water

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options identified to address or mitigate the issues and risks associated with this water supply scheme include:

- Upgrade and improve the filtration and disinfection equipment
- Replace the UV disinfection system
- Upgrade of the distribution network.

**(e) Preferred Council Response**

The following works have been programmed in Council's Water Supply Asset Management Plan 2004:

- It is planned to upgrade and improve the filtration and disinfection processes as the Ministry of Health grading for Ohakune water supply cannot be improved until treated water is chlorinated continuously to maintain specified minimum residuals in the distribution system.
- It is also planned to replace the obsolete UV disinfection system with a new generation UV system to comply with Ministry of Health requirements.
- Development work is required in those parts of the reticulation that currently cannot provide sufficient flows for fire fighting purposes. This work will be included as part of the distribution network renewal programme.

**7.6.2 Sewerage**

**(a) Services Provided Within the Ohakune Township**

The Ohakune sewage system was commissioned in 1972. Oxidation ponds were constructed and 11,150m of reticulation laid from these to the rental business and immediate surrounding areas. In 1975 the reticulation was extended by 1,870m to connect outlying areas, which included the New Zealand Railway houses in Railway Row, Ruapehu Road, and Egmont Street, all of which had previously been serviced by septic tanks.

More recent subdivisional development has seen further extensions of the system to its present form.

The Ohakune sewage treatment plant is situated adjacent to the Mangawhero River and is accessed off State Highway 49 on the northern side of Ohakune. The plant consists of a step screen that removes all material larger than 3mm from the incoming sewage. The oxidation ponds are contained within one bunded area, which has been divided by a low wall constructed of corrugated fibrolite sheeting. The two ponds are operated in series. The primary pond has a surface area of 2.2 hectares and has been equipped with four 2.2 kW aerators to boost oxygen levels during the winter months when the loading is much higher than usual. The maturation pond has a surface area of 1.1 hectares. The depth of both ponds is 1.07 metres. Treated effluent is discharged directly to the Mangawhero River from an outlet situated in the maturation pond.

Operators of Turoa Ski Field facilities currently have an arrangement to discharge the sewage from the mountain facility into Council's reticulation and pay for this service on an annual basis.

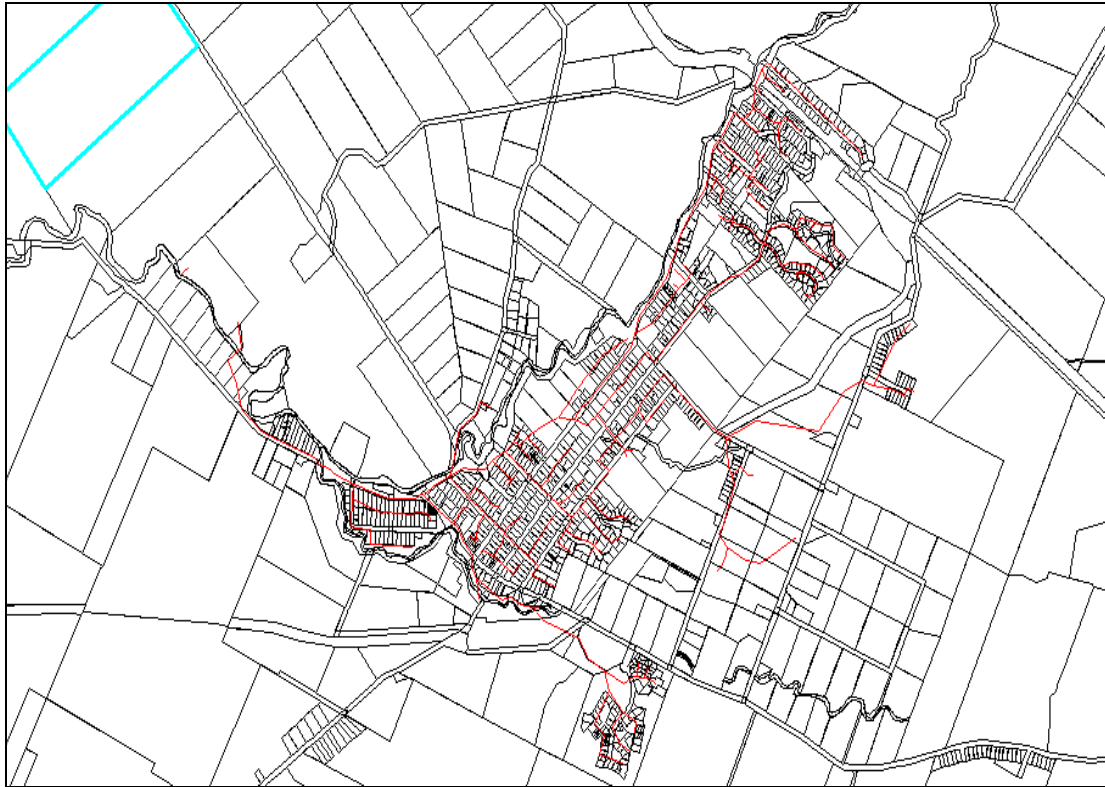


Figure 9 Plan of Ohakune Sewage Scheme

**(b) Future Demand**

Development work that will be required in the foreseeable future involves increasing the capacity of some parts of the reticulation when it is renewed, and the construction of a tertiary treatment system at the treatment plant. The assessment of peak flows in the system will include the discharge of sewage from Turoa ski fields and developments around Turoa Village.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of this service to the Ohakune Community:

- Excessive groundwater infiltration resulting in overflows from reticulation and / or treatment plant.
- Unauthorised access to the treatment facility could result in serious injury or fatality from drowning.
- Breach of Resource Consent conditions could result in major environmental impacts and health concerns.

The Ohakune sewage treatment plant is currently operating without a discharge permit and has done so since March 1992. The Regional Council is currently processing the notified application.

It is not considered that the Ohakune sewage system poses a significant health risk to the residents of the township. However it is recognised that the direct discharge of the treated effluent from the oxidation ponds into the Mangawhero River is not acceptable to local Iwi for cultural reasons. The discharge point is also upstream of an area used for recreational use and could pose a health risk to uses of this facility during times of summer low flows.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Council is required to provide some means of tertiary treatment to deal mainly with the algae, nutrients, and faecal coliforms currently being discharged to the Mangawhero River. While it was acceptable to do this when the plant was first built, this is no longer the case. A conceptual design for the treatment plant upgrade prepared by consultants has been submitted as part of the application for the renewal of resource consent.
- Ensure security at the treatment plant site is maintained and any decline in discharge effluent quality as indicated from routine monitoring is investigated and attended to immediately

**(e) Council Preferred Response**

The favoured option for improving the treatment process to produce effluent acceptable to the community and the Regional Council is to install a two-day retention sub-surface wetland, followed by an ultra-violet disinfection unit. Effluent will then be discharged into the Mangawhero River through a rock filter. The erratic operation of the four aerators through dissolved oxygen probes and inadequacy of step screen to deal with peak ski season flows will be investigated and incorporated into the treatment plant upgrade. These works are currently programmed to occur in 2004.

**7.6.3 Stormwater**

**(a) Services Provided in the Ohakune Township**

The stormwater system in the Ohakune township area consists of a reasonably extensive reticulated network of roadside sumps, manholes and connecting pipework as well as a number of open stormwater drains and culverts under roads, which have been constructed in the past to convey stormwater and discharge to a number of natural watercourses which flow through the township. Council has generally not maintained the natural watercourses.

**(b) Future Demand**

A number of sections of the existing stormwater reticulation have been identified as requiring upgrading. There will be an ongoing requirement to upgrade and pipe existing open drains within the township as well as the continued maintenance of the existing stormwater network. New

developments will also increase run-off from currently undeveloped land that will have to be collected and controlled in order to prevent flooding of downstream properties.

Maps produced by Horizons Regional Council show that the estimated flood levels of the Mangawhero and Mangateitei Rivers would in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) probably inundate the lower lying areas of Ohakune.

**(c) Risk Assessment**

A generic risk assessment has been carried out for stormwater schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment.

From the risk assessment process that is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher.

However there would be a risk of flooding to properties in the lower lying areas adjacent to the Mangawhero and Mangateitei Rivers and other watercourses that flow through the township, in the event of a major flood event.

It is not considered that the current reticulated system; open drains, culverts, or natural watercourses present a significant public health risk.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

All though the above risk assessment has not indicated any high risk to public health or the environment, the following options have been identified to improve the performance of the system:

- Status quo,
- Piping of all open drains,
- Increased maintenance of natural watercourses,
- Extension and upgrading of existing stormwater collection systems.

**(e) Council Preferred Response**

Although the current stormwater network in Ohakune creates no significant risks to public health or the environment, it is recommended that Council undertake a programme of staged and ongoing maintenance of natural watercourses and upgrade any sections of the stormwater reticulation that are unable to provide the required level of service.

## 7.7 WATER SERVICES - RAETIHI TOWNSHIP

### 7.7.1 Water Supply

#### (a) Services within the Raetihi Township

Raetihi is a rural service town approximately 10km from Ohakune. The Township is situated on State Highway 4 adjacent to the Makotuku River.

#### Water Source

Water for Raetihi is currently taken from the Makotuku River immediately upstream of the SH49 road bridge and piped to settling ponds south of the bridge, and from there 6.9 km to the treatment plant on the hill above the township. The only treatment given is primary settling and chlorination. The complete system is gravity fed.

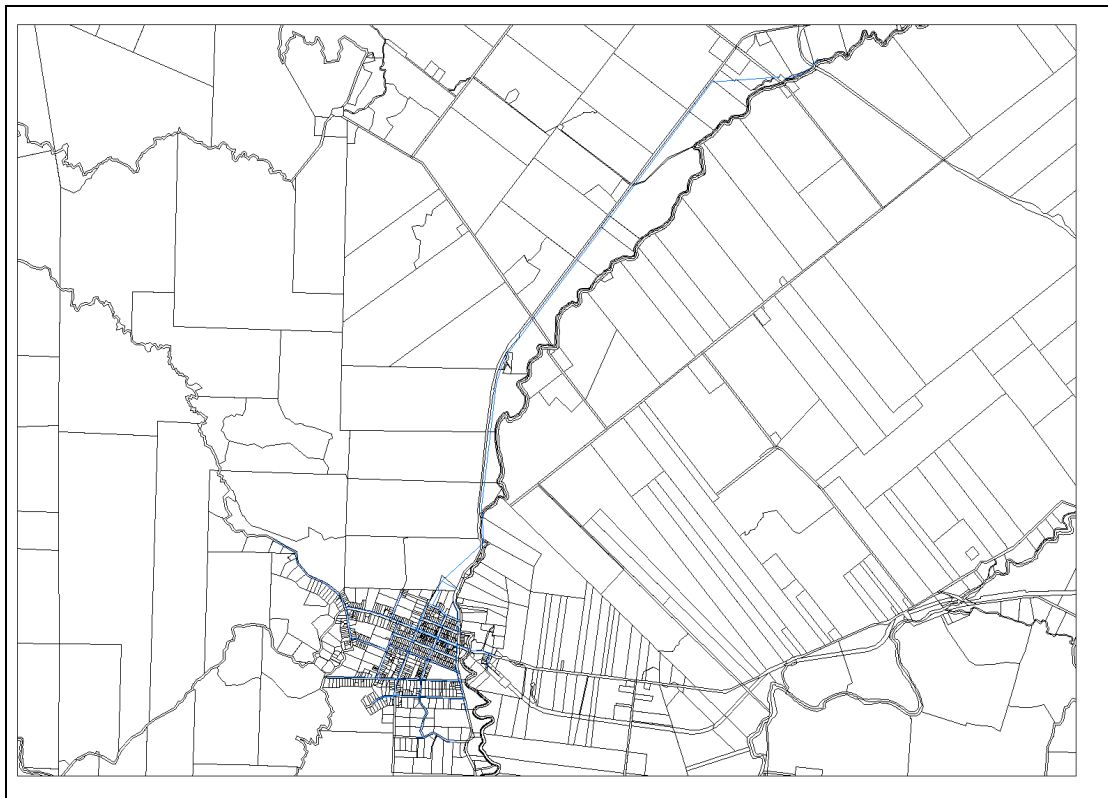


Figure 11: Raetihi Water Supply Infrastructure

#### Quantity

The maximum amount of water that can be taken from the Makotuku River is currently set at 1,200m<sup>3</sup>/day, which represents 9.6% of the low summer flow in the Makotuku River. There is adequate flow in Makotuku River even during these periods of low flow to meet the requirement of the township.

Leakage in the distribution system has been and continues to be a problem. A comprehensive leakage study by consultant carried out in 1999 showed exceptionally high night flows representing a very high level of leakage with the cause probably being old AC pipes that are now failing.

The reticulation system has adequate capacity to meet the demand and fire flows.

### Quality

Land use in the catchment above the intake has changed significantly since it was commissioned in 1969. At that time the catchment was mainly covered in beech forest, cutover bush, and some pasture. The likelihood of the supply becoming polluted was therefore low. In recent years however market gardeners have moved into the catchment, and as tilled areas are often left open to the elements during the winter months, much topsoil is being washed into the Makotuku River during periods of heavy rainfall.

The Raetihi treatment plant received an E grading from the Ministry of Health in 1993 mainly because only partial treatment is given. It is considered that there is a high level of risk to consumers that they will become ill through drinking the water supplied.

The grading can only be improved by providing Raetihi with a water treatment plant that can successfully treat the raw water supplied, and which will consistently produce water that complies with the Drinking-Water Standards for New Zealand 2000.

### **(b) Future Demand**

The system has adequate capacity for the population it currently serves. The township's population has declined over previous years and it is not considered that there will be any significant increase in the population during the period covered by this report. Consequently it is not expected that there will be any greater demand for water supply during this period.

### **(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the Ohakune Community:

From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in Raetihi:

- Contamination of the water supply at the source.
- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access).
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

- Failure of the disinfection equipment.
- Unauthorised access to the settling pond area could result in fatality due drowning.

It is considered that the community are at risk to contracting water borne diseases from drinking treated water that does not comply with NZDWS: 2000.

**(d) Options to Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issues and risks associated with this system include:

- Source new water supply,
- Upgrade treatment plant,
- Upgrade network infrastructure,
- Ensure security at the treatment plant site is maintained.

**(e) Council Preferred Response**

Council has resolved during adoption of the Future Ruapehu Long Term Plan 2004-2014 to upgrade the Raetihi water treatment plant. Investigations have been undertaken to determine the best source of water for Raetihi, and the plant that will be constructed will be capable of treating the water delivered from this source to the current Drinking Water Standard.

Council has made a commitment to renew the older sections of the distribution network constructed of asbestos cement pipe. It is also planned to fix leaks in the service reservoir and replace the corrugated iron roof.

**7.7.2 Sewerage**

**(a) Services Within the Raetihi Township**

Very few historical details of the Raetihi sewage system are available. It is thought that the first sewage system was installed around the same time as the water supply was commissioned in 1916. There have been a number of improvements and extensions to the system undertaken over the years, the last of which saw the large septic tank alongside the camping ground taken out of service and replaced with the existing oxidation ponds around 1983.

The Raetihi sewage treatment plant is situated between State Highway 4 and the Makotuku River on the southern side of the township and consists of two ponds operated in series. The primary pond has a surface area of 11,800m<sup>2</sup>, while the secondary pond has a surface area of 8,041m<sup>2</sup>. Treated effluent is discharged directly to the Makotuku River.

The estimated design capacity of the ponds is adequate to treat flows from an equivalent population of about 1,700. The current population of Raetihi is around 1,100 and is not expected to increase for some time.

There are three sewage-pumping stations within the Raetihi reticulation, one in Seddon Street, another adjacent to the camping grounds on SH4, and the third is close to the eastern abutment of the highway bridge spanning the Makotuku River. All have the usual wet well/submersible pump type facilities, and have been equipped with Flygt submersible pumps. Both SH4 and Seddon Street pump stations have a standby pump, while the Ohakune – Raetihi Road bridge pump station has only one pump.

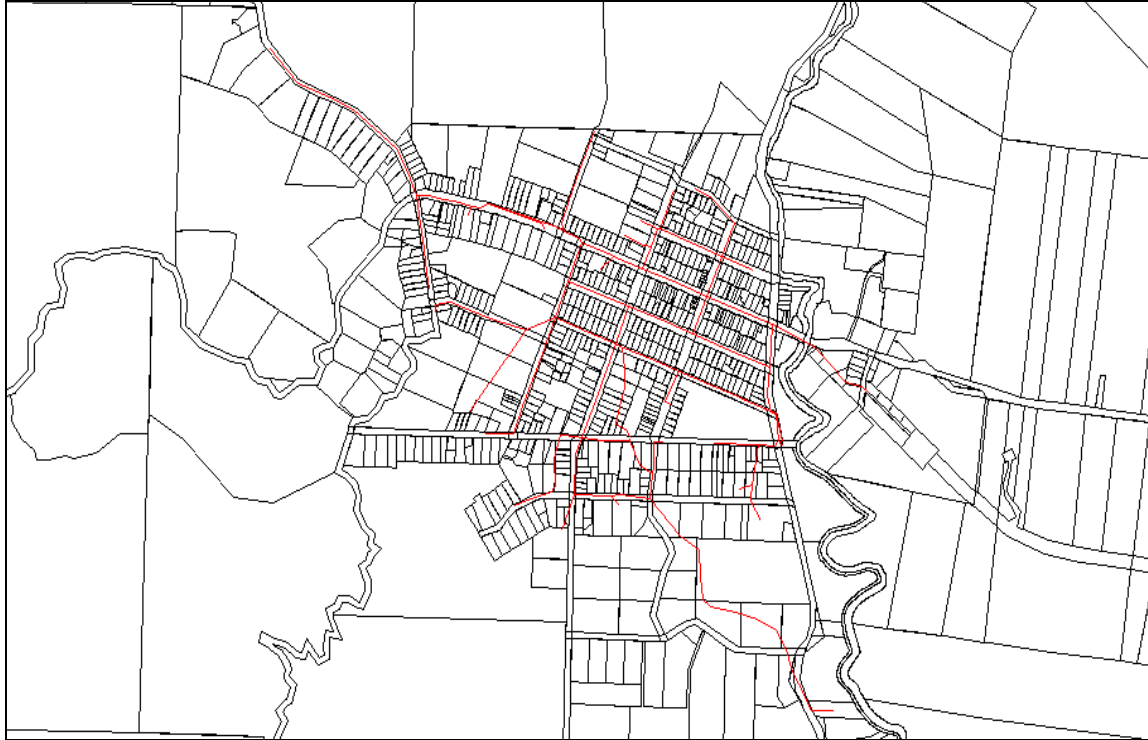


Figure 12: Raetihi Sewerage Infrastructure

**(b) Future Demand**

There has been little growth experienced in the township of Raetihi over the past few years and this trend is not expected to change significantly over the period covered by this report.

**(c) Risk Assessment**

A generic risk assessment has been carried out for sewage schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of this service to the Raetihi Community:

- Excessive groundwater infiltration resulting in overflows from reticulation and / or treatment plant.
- Unauthorised access to the treatment facility could result in fatality from drowning.
- Breach of Resource Consent conditions could result in environmental impacts and health concerns.

It is not considered that the Raetihi sewage system poses a significant health risk to the residents of the township. However it is recognised that there is some concern that the level of treatment provided could have a potential adverse effect on the environment; and direct discharge of the treated effluent from the oxidation ponds into Makotuku River is not acceptable to local Iwi for cultural reasons.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

The options available to address or mitigate the issue and risks associated with this system include:

- Installation of a stand-by pump in the Raetihi-Ohakune Road bridge pump station will provide the required security against overflows.
- Provision of tertiary treatment,
- Ensure security at the treatment plant site is maintained,
- Any decline in discharge effluent quality as indicated from routine monitoring is investigated and attended to immediately

**(e) Preferred Council Response**

The only critical development work that needs to be undertaken on the Raetihi sewage system is the provision of tertiary treatment to improve the quality of effluent being discharged to the Makotuku River. The conceptual design of a subsurface flow wetland and rock filter outlet to the tertiary treated effluent has been proposed in the application for the renewal of resource consent; now being processed by the Regional Council.

**7.7.3 Stormwater**

**(a) Services Provided Within The Raetihi Township**

The stormwater systems in the township of Raetihi consist of a reticulated network of roadside sumps, manholes and connecting pipework as well as a number of open stormwater drains and culverts under roads, which have been constructed in the past to convey stormwater and discharge to natural watercourses. Council has generally not maintained the natural watercourses.

Maps produced by Horizons Regional Council show that the estimated flood level of the Makotuku River and other major watercourses that pass through the township would in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) inundate the lower lying areas of the township.

**(b) Future Demand**

There is an ongoing requirement to upgrade and pipe existing open drains within the township as well as the continued maintenance of the existing stormwater network.

**(c) Risk Assessment**

A generic risk assessment has been carried out for stormwater schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment.

From the risk assessment process that is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher.

It is not considered that the current reticulated system; open drains, culverts, or natural watercourses presents a significant public health risk. However there would be a risk of flooding to properties in the lower lying areas adjacent to the Makotuku River in the event of a major flood event.

**(d) Options to Address Future Demand, Public Health, and Environmental Issues**

All though the above risk assessment has not indicated any high risk to public health or the environment, the following options have been identified to improve the performance of the system:

- Status quo,
- Piping of all open drains,
- Increased maintenance of natural watercourses,

**(e) Council Preferred Response**

Although the current stormwater network in Raetihi creates no significant risks to public health or the environment, it is recommended that Council undertake a programme of staged and ongoing maintenance of natural watercourses and upgrade any sections of the stormwater reticulation that are unable to provide the required level of service.

**7.8 WATER SERVICES – URBAN SETTLEMENTS / RURAL SCHOOLS / NON COUNCIL SERVICES**

**7.8.1 Non Council Water Supply Services**

According to the *2003 Register of Community Drinking Water Supplies in New Zealand* there are a number of small water supplies within the Waimarino that are operated by other organisations supplying a varying number of persons. These are located at –

- Iirangi Naval Station operated by the Defence Force’s contractor,
- Karioi Pulp Mill operated by Winstone Pulp Int Ltd,
- Pipiriki Township operated by Department of Conservation,
- Rangataua township (part) operated by community group (the system no longer exists),
- Turoa Skifield operated by RAL,
- Tangiwai Timber Mill operated by Tangiwai Timber Mill.

Council has little or no information relating to the sources, quantity of water abstracted or required, the quality of the water abstracted or distributed, the risks associated with the various water supplies or any options the various water suppliers may or may not be taking to address any risks that may or may not have been identified.

### **7.8.2 Non Council Services**

The Department of Conservation provides water services in the township of Pipiriki and within the Whanganui National Park and other conservation lands. The Department provides no stormwater drainage or sewage treatment systems. The following information has been received from the Department of Conservation.

#### **(a) Water Services Provided**

Council recognises that residents in rural areas of the district rely on roof tanks, springs or bores for water supply and on septic tanks for sewage treatment and disposal.

The Department of Conservation maintains water supplies at:

- Pipiriki Township  
Water for the Department workshop and public toilets is sourced from a nearby spring. Mid Central Health samples this water at random time periods.
- Tieke Kainga  
Water to the kitchen and hand wash basin is sourced from a spring supply. Water for the campground is provided by roof supply.
- Other Department of Conservation Campsites  
Water is provided to these sites including; Mangapapa, Poukaria, Ohinepane, and Whakahoro from roof storage tanks.

Tieke Kainga, Mangapapa, Poukaria, Ohinepane campsites are serviced by sewage containment vaults, which are pumped out as required by the licensed sewage contractor.

#### **(b) Demand Projections**

The water supplies identified above are adequate to meet current and forecast demand.

The sewage containment vaults have only recently been installed and the capacity of these vaults is considered adequate for the forecast visitor numbers for the next 10 years

#### **(c) Risk Assessment**

The risks and effects of roof tanks, springs or bores and septic tanks used by residents in non-serviced communities in rural areas would be the same as those identified for other communities such as rural schools and Marae.

Apart from the Pipiriki supply all water supplies have signage in line with National DoC Policy that reads, "WARNING! In general the water provided at this facility is clean and able to be drunk without treatment. But users may wish to boil or treat the water before use for their own protection".

### **7.8.3 Pipiriki**

#### **(a) Sewerage**

##### Services Provided in Pipiriki

Pipiriki is a small rural settlement situated on the Whanganui River some 25km west of Raetihi.

The Waimarino District Council constructed the Pipiriki sewage system in 1988. The scheme provides a septic tank effluent disposal service for 36 properties within this small settlement. The scheme was installed, as septic tanks were not working properly because of poor soakage.

The reticulation consists of approximately 1,900 metres of 80mm and 100mm diameter PVC mains which convey the supernatant liquid collected from the 23 septic tanks by gravity to a single pump station.

The pump station is provided with two pumps, normally one working and one standby which pump the collected effluent to the treatment plant via an 80mm diameter PVC rising main 85m long.

The treatment plant consists of two 10.7 metre diameter "Timber tank" gravity sand filters, each 1.25 metres deep. Effluent is delivered onto the surface of the filters and is treated as it moves down through the media to perforated drains in the floor. From there it is discharged to the adjacent Kaukore Stream.

##### Future Demand

The present system was designed to cater for a population of around 200 persons and is sufficient for the needs of the community it currently serves. However it is considered that the increase in usage experienced over the summer months as a result of visitors coming off the Whanganui River and using the public facilities places an increased loading on the treatment plant. To date this has not had an adverse effect on the facility



Figure 13: Pīpiriki Sewerage Infrastructure

### Risk Assessment

A generic risk assessment has been carried out for sewage schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, it is not considered that the Pīpiriki sewage system poses a significant health risk to the residents of the township. However it is recognised that there is some concern that the level of treatment provided could have a potential adverse effect on the environment; and direct discharge of the treated effluent from the treatment plant into Kaukore Stream is not acceptable to local Iwi for cultural reasons.

The 21 septic tanks also require regular cleaning out on a 5 yearly cycle in order to maintain optimum functionality and prevent causing a public health risk.

### Options to Address Future Demand, Public Health, and Environmental Issues

Other than the continued maintenance of the system and the regular cleaning out of septic tanks, there are no plans for the upgrading of the system or the treatment plant at this stage.

### Council Preferred Response

Council intends to maintain this scheme at its current status.

**(b) Stormwater**

Services Provided Within Pipiriki Township

The stormwater systems within the settlement of Pipiriki consist mainly of roadside drains, open stormwater drains, and culverts under roads that have been constructed in the past to convey stormwater through the settlement and discharge into waterways, which eventually discharge into the Whanganui River. These systems have received minimal maintenance by Council over the years.

Maps produced by Horizons Regional Council show that the estimated flood level of the Whanganui River would in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) not inundate the settlement of Pipiriki due to its elevated position above the river.

Future Demand

Apart from continued or improved periodic maintenance, it is not expected that the existing stormwater network within the settlement of Pipiriki will be expanded to any extent.

Risk Assessment

A generic risk assessment has been carried out for stormwater systems. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, it is not considered that the current stormwater collection and disposal system within this rural settlement presents a significant public health risk.

Options to Address Future Demand, Public Health, and Environmental Issues

Although the above risk analysis has not highlighted any significant concerns the following options have been identified for the future of this stormwater scheme:

- Piping of all open drains,
- Improved maintenance of open drains,
- Status quo.

Council Preferred Response

As this stormwater scheme presents a low level of risk to the community it is recommended that Council continue this system at its current status.

#### **7.8.4 Rangataua**

##### **(a) Sewerage**

###### Services Provided within Rangataua

Rangataua is a small rural settlement situated between State Highway 49 and the North Island Main Trunk Line, approximately 5km south east of Ohakune. The settlement comprises of approximately 113 dwellings, a hall and a closed school which are all connected to the sewage system with another 12 or so properties on the perimeter of the township which are not.

The Rangataua sewage system was fully commissioned in the early months of 1989. Prior to this the only sewage treatment facility that existed was a small anaerobic plant that served the former New Zealand Railway houses owned by Carter Holt Ltd. Early in 1985 the Health Department was becoming concerned at the poor performance of this plant. They were also concerned that septic tanks in the area were not working properly, especially during the winter months when the water table was on average only 400mm below the surface.

The reticulation consists of approximately 3,400 metres of 150mm diameter PVC gravity main, which collects sewage from the various properties, and discharges into the single sewer pump station on the corner of Marino and Kaha Streets.

The sewer pump station is a usual wet well/submersible pump type facility equipped with Jung submersible pumps set up in a duty/standby configuration. The pumps pump collected sewage to the treatment plant via a 80mm diameter rising main, 800m long.

The Rangataua sewage treatment plant is located on the unsealed section of Neil Street to the east of the township and consists of two ponds operated in series. The primary pond has a surface area of 1,608m<sup>2</sup>, while the secondary pond has a surface area of 1,089m<sup>2</sup>. The depth of each pond is 1.35 and 1.25 metres respectively. Treated effluent is discharged to a wetland alongside the ponds with three timber weirs to provide retention for settlement of carry over sludge and additional treatment by the naturally occurring plants. The maximum depth of the pond behind the weir is limited to 200mm to provide optimum condition for the growth of wetland vegetation.



Figure 14: Rangataua Sewerage Infrastructure

#### Future Demand

The township of Rangataua is currently experiencing a period of growth with a number of new subdivisions and houses being built or moved in. However the original design catered for a total population of over 200 persons and it is considered that there is still sufficient capacity within the system to cater for the current growth.

#### Risk Assessment

A generic risk assessment has been carried out for sewerage schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process which is provided in Appendix 1, the following issues have been identified as being potential high risks associated with the Rangataua sewage collection, treatment and disposal system:

- Excessive groundwater infiltration resulting in overflows from reticulation.
- Unauthorised access to the treatment facility could result in fatality from drowning.
- Breach of Resource Consent conditions could result in environmental impacts and health concerns.

One of the known problems appears to be stormwater infiltration into the system which floods the sewage pump station in times of heavy rain and

causes overflows of sewage from the gulley trap of a property at the lowest point in the system.

#### Options to Address Future Demand, Public Health, and Environmental Issues

The options available to address or mitigate the issues and risks associated with this system include:

- Installation of a larger pump in the pump station,
- Take measures to ensure that security at the treatment plant site is maintained,
- Any decline in discharge effluent quality as indicated from routine monitoring is investigated and attended to immediately

#### Council Preferred Response

It is considered that installation of a larger pump in the pump station will provide the temporary security against overflows however the cause and source of the stormwater infiltration will need to be assessed and remedied.

#### **(b) Stormwater**

##### Services Provided Within Rangataua

There are a number of open and piped stormwater drains that convey stormwater through and away from the Rangataua Township and discharge into the watercourses that flow through the township. These drains have received minimal maintenance by Council in the past but increased maintenance in recent years has improved drainage in the township to some extent.

Maps produced by Horizons Regional Council show that the estimated flood level in the Mangaehuehu River would in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood) not affect the Rangataua Township.

##### Future Demand

Apart from continued maintenance of the stormwater network, it is considered that the existing network is adequate for the discharge of stormwater from the township under normal circumstances.

##### Risk Assessment

A generic risk assessment has been carried out for stormwater schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher.

Although analysis has not highlighted any significant risks in relation to the stormwater service provision in Rangataua, a number of the Townships

residents do not consider that the current system of open drains and culverts is acceptable; it is not considered that they present a significant public health or environmental risk.

#### Options to Address Future Demand, Public Health, and Environmental Issues

Although risk analysis has not highlighted any significant risks in relation to this service, the following options have been developed to address publicly perceived risks with this service:

- Piping of all open drains,
- Increased or improved maintenance of open drains, or
- Status quo.

#### Council Preferred Response

As the current Rangataua stormwater network provides no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near futures, Council preferred option is to maintain the status quo.

### **7.8.5 Rural Schools**

#### **(a) Water Supply**

##### Services Provided in Rural Schools

There are two rural schools in the Waimarino Ward situated in relatively isolated locations, away from any other significant communities. These schools are located at Pipiriki and Oroutoha and cater for between 10 and 24 pupils.

According to the *2003 Edition of the Register of Community Drinking Water Supplies in New Zealand*, these schools obtain water off the roofs of the school buildings. The water systems are operated and maintained by the schools' Boards of Trustees.

The supplies for these schools appear sufficient to supply their water supply needs.

Both sources of water supply are ungraded by the Ministry of Health, however the *Draft Annual Review of Drinking Water Quality* produced by the Ministry of Health for 2003 indicates that neither school monitored their supply for bacteriological or protozoan compliance for the 2003 year.

Although water supplied from these sources may be considered to be potable, it is evident that the supplies would not achieve compliance with the New Zealand Drinking Water Standards 2000 (NZDWS:2000). Community education on the risks associated with the water supply and improved maintenance of water storage tanks is recommended.

### Future Demand

It is not expected that the roll of these schools will increase to any great extent over the period covered by this report. Consequently it is not expected that there will be any greater demand from the method of water supply during this period.

### Risk Assessment

A generic risk assessment has been carried out for drinking water schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to rural schools:

- Contamination of the water supply at the source ie spring, roof or stream.
- Contamination of the water supply in the reservoir from the ingress of birds, vermin, or vandalism (unauthorised access).
- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

It is considered that there is potential for pupils to be at risk to water borne diseases from drinking untreated water.

### Options to Address Future Demand, Public Health, and Environmental Issues

The options available to address or mitigate the issues and risks associated with this system include:

- Status quo – No Council involvement
- Undertake an education campaign on how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

### Preferred Council Response

It is recommended that Council undertake a community education programme to increase public awareness of water borne diseases and methods to eliminate these risks, such a boiling all drinking water, filtration and regular storage tank cleaning and maintenance. The programme should also inform the community about the maintenance of collection, storage, treatment and distribution systems for small drinking water supplies.

The New Zealand Water and Waste association have recently produced a booklet titled 'The Story of Drinking Water' which provides information on the risk associated with small water supplies and the best methods to manage

these risks. It is recommended that this booklet be provided to all properties that currently source and provide their own water supply.

**(b) Sewerage**

Services Provided at Rural Schools

Sewage at both rural schools is treated by on-site septic tanks. The effluent from the Pipiriki Schools is disposed to the Council sewage collection and treatment system. The effluent from Oroutaha School is disposed of by means of ground soakage.

Future Demand

It is not expected that loadings on the schools' present sewage systems will increase significantly over the period covered by this report and consequently it is not expected that there will be any significant increase in discharge of sewage effluent.

Risk Assessment

A generic risk assessment has been carried out for sewerage schemes. A quantitative risk assessment has been undertaken making use of any impact / probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified for the collection and disposal of sewage that attracted a profile of 6 or higher. Public health risk is considered negligible due to the low population density of the areas.

Options to Address Future Demand, Public Health, and Environmental Issues

The options identified to address or mitigate the issues and risks associated with this system include:

- Status quo,
- Undertake an education campaign on the operational and maintenance needs of septic tanks.

Preferred Council Response

It is recommended that council undertake a community education programme to increase public awareness on the operation and maintenance needs of septic tanks. Increased public awareness will assist in reducing potential environmental and public health risks from the disposal of sewage.

The New Zealand Water and Waste Association have recently produced a booklet titled, 'The Story Of Your Septic Tank' which gives a 'hands on' approach to the operation, care, and maintenance of septic tanks. It is recommended that this booklet is provided to all properties that currently dispose of their waste water through a septic tank system.

**(b) Stormwater**

Services Provided in Rural Schools

There are no formal stormwater discharge systems at the rural schools at Oroutaha and Pipiriki. Stormwater from the school building roofs and adjacent surfaced areas is discharged via natural overland flow paths to adjacent creeks or waterways.

Future Demand

Due to the absence of any expected expansion at either of the rural schools, it is not expected that the existing stormwater systems will be required to be expanded to any extent.

Risk Assessment

A generic risk assessment has been carried out for stormwater schemes. A quantitative risk assessment has been undertaken making use of any impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher. It is not considered that the current stormwater collection and discharge systems at either of the rural schools present a significant public health risk.

Options to Address Future Demand, Public Health, and Environmental Issues

The options available to address or mitigate the issues and risks association with this system include:

- Status quo,
- Piping of all open drains
- Increased or improved maintenance of open drains.

Preferred Council Response

As the stormwater systems provide no significant risks to public health or the environment and it is not considered that the demand for these services will significantly alter in the near future, Council's preferred option is to maintain the status quo.

**7.9 WATER SERVICES - MARAE**

**7.9.1 Services Provided to Marae**

There are eight marae spread throughout the Waimarino Ward, marae recorded in the 2001 census are listed in Appendix 4. Council does not currently have any information relating to the provision of Water Services to the marae that are not connected to Council systems.

**(a) Water Supply**

It is assumed that as the majority of the marae are in rural areas, water is obtained from nearby springs, bores or collected off roofs of marae buildings and stored in tanks on site.

**(b) Sewerage**

It is also assumed that where a particular Marae is not connected to a Council sewage system, sewage is disposed of by means of on-site septic tanks and effluent disposal to ground by means of soakage fields.

**(c) Stormwater**

It is envisaged that stormwater from the marae building roofs and surfaced areas would be discharged to ground via natural run-off patterns where no formal stormwater discharge system exists.

**7.9.2 Future Demand**

Due to their very nature, there will always be a fluctuating demand placed on the water services for marae. There may be periods where there is little or no activity on a marae, and other times where the water supply and sewage disposal systems may be under considerable 'load'. The capability of the relative systems' ability to cope under these circumstances will depend on their original design and construction and how they have been developed and maintained over time.

**7.9.3 Risk Assessment**

It is considered that water services associated with rural marae could potentially present a significant public health risk due to the ability (or lack thereof) at times to supply large groups of people with untreated drinking water which may have been stored for some time and could be at risk to being contaminated, as well as sewage systems that may not be able to cope with peak loadings.

**7.9.4 Options to Address Future Demand, Public Health, and Environmental issues**

The options available to address or mitigate the issues and risks association with these systems include:

- Status quo – No Council involvement,
- Undertake an education campaign on the importance of maintaining septic tanks,
- Undertake an education campaign of how to reduce the risks of water services of these types,
- Upskilling of persons responsible for the operation and maintenance of small water supplies and awareness of the requirements of the New Zealand Drinking Water Standards.

#### **7.9.5 Preferred Council Response**

It is recommended that Council undertake a community education programme to increase public awareness of the necessity of maintaining septic tanks and their maintenance requirements, and increase public awareness of water borne diseases and methods to eliminate these risks. Increased public awareness will assist in reducing both the environmental and public health risks from these services.

The New Zealand Water and Waste Association have recently produced two booklets titled 'The Story of Your Septic Tank' which gives a 'hands-on' approach to the operation, care, and maintenance of septic tanks, and 'The Story of Drinking Water', which provides information on the risk associated with small water supplies and the best methods to manage these risks. It is recommended that these booklets be provided to all marae that currently dispose of their wastewater through a septic tank system and / or source and provide their own water supply.

## 8.0 WAIOURU WARD

### 8.1 INTRODUCTION

8.1.1 The Waiouru Ward is situated at the southern extremity of the District, east of Ohakune. The Ward consists mainly of the New Zealand Army's training base with a few residential and commercial properties adjacent to State Highway 1 outside the perimeter of the army camp. The Ward is the District's third Largest by population (1686 at the 2001 census) and smallest by area (715km<sup>2</sup>).

8.1.2 Key statistics for the Waiouru Ware are provided in the following table.

<b>Waiouru Ward – Key Statistics</b>	
Population	1,686
Area	715km <sup>2</sup>
Number of water supply connections	65
Number of properties on metered supply	24
Number of rateable properties	142
Main Industry	Waiouru Army Training Camp
Possible growth industries	Tourist service sector
Number of schools	1

Table 18: Key Statistics for Waiouru Ward

### 8.2 SETTLEMENTS

8.2.1 There is one main settlement in the Waiouru Ward, namely the Waiouru Township. Waiouru is a small town primarily developed on servicing the Waiouru Military training camp. The town has a usually resident population of 1,647 (2001 census), a decrease of 834 (-33.6%) from 1996.

The median income of people in Waiouru is \$26,300, compared with \$16,700 for Ruapehu District and \$18,500 for all of New Zealand.

### 8.3 CEMETERIES

#### 8.3.1 Services within the Waiouru Ward

There are no Urupa or Council provided cemeteries within the Waiouru Ward. There is however a cemetery in Waiouru that is managed by the New Zealand Army.

#### 8.3.2 Demand Projections

There has been no request or demand for Council-provided cemeteries in the Waiouru Ward. No information was made available about the New Zealand Army cemetery at the time this document was written.

**8.3.3 Risk Assessment**

Not required

**8.3.4 Options to Address Future Demand, Public Health, and Environmental Issues**

Due to the transient nature at NZ Army personnel in Waiouru there is no predicted demand from this sector the Waiouru community for cemetery provision. The balance at the Waiouru community may prefer to have a choice of burial in Waiouru. Council has the option of subdividing a small parcel of residential land it owns to provide a cemetery, if there was a public demand for a cemetery. Due to the transit nature of the NZ Army personal in Waiouru, there is no predicted demand from this sector or the Waiouru community.

**8.3.5 Council Preferred Response**

No provision of this service in Waiouru unless public demand was high.

**8.4 PUBLIC TOILETS****8.4.1 Services within the Waiouru Ward**

The Tangiwai public toilet facility is located on the Tangiwai Memorial Reserve. The facility is predicted to be used only by travellers or tourists stopping for the purpose of visiting the reserve to access knowledge of the Tangiwai train disaster of 1953. This facility was built as a joint project between the Council and the Lions Club with the reticulation of water to the site provided by the Winstone Pulp Mill located approximately 500 meters north of the site. Occasionally in winter the water reticulation pipe freezes and running water is unavailable to the facility for short periods of time. This issue is identified as requiring mitigation through the installation of a header storage tank. The imminent threat of the lahar likely to destroy the facility in the short term has resulted in further expenditure on the facility being delayed until post lahar event.

There is a large public toilet facility at Waiouru. The volume of private travellers and those on buses is extremely high on State Highway 1. This facility is used extensively by buses on the Wellington – Auckland route being approximately 2 hours from Palmerston North in the south, 2 hours from Taupo in the north and 2 hours from Taumarunui in the west from State highway 49 and 4. The toilets are open 365 days per year, 24 hours per day. Surveys have established that users of this facility are almost without exception, visitors travelling to or through Waiouru.

There are three petrol stations and a number of small cafes and eating venues and the Waiouru Army Museum all of which have toilet facilities catering for their customers.

**8.4.2 Demand Projections**

Generally there is predicted to be a slow but steady increase in the number of tourists visiting or travelling through the township of Waiouru.

### **8.4.3 Risk Assessment**

A risk assessment has been carried out on the public toilet service provided within the Waimarino Ward. A quantitative risk assessment has been undertaken making use of an impact/probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this Assessment. There were no assessed risks to the Waimarino public toilet services that received a risk profile of 6 or greater.

Further information on this risk assessment process is provided as Appendix 1.

### **8.4.4 Options to Address Future Demand, Public Health, and Environmental Issues**

It is possible that the number of stalls in Waiouru do not adequately cater for the very high use by bus passengers. The volume of through visitors is expected to increase at the same rate as any increase in tourist numbers in the North Island. There is sufficient room on the land owned by Council to extend the existing facility in the future.

### **8.4.5 Council Preferred Response**

Further investigation into the ability of Council's public toilets in Waiouru to meet the expected demand will be undertaken as part of the review of Council's Recreation and Community Facilities Asset Management Plan in 2006.

## **8.5 SOLID WASTE**

### **8.5.1 Services within the Waiouru Township**

The New Zealand Army operates the Waiouru landfill, servicing both the military and civilian communities at Waiouru. The services to the general public are provided by arrangement with the Ruapehu District Council. At the landfill some recycling occurs, and there are options for the community to recycle while they utilise the landfill. In the town there is no active recycling campaign.

The Landfill is attended during hours that the public have access to the facilities.

The Landfill has discharge permits issued by Horizons Regional Council that expire in 2034. The landfill is operated by a contractor on behalf of the NZ Army.

### **8.5.2 Future Demand**

The Waiouru Township has declined significantly, with army houses recently offered for removal from a significant proportion within the army base. There is recognition however that the army is intending on maintaining and increasing the numbers located at the base and as such will require a core level of service onsite to maintain its training facilities.

At current filling rates the landfill has sufficient capacity to serve the community for between 15 and 20 years.

### **8.5.3 Risk Assessment**

There is potential that a Lahar will flow down the Whangaehu River and cut either State Highway 1 or State Highway 49. As the New Zealand Armed Forces undertake the management of facilities in the Waiouru town, services are unlikely to be reduced by the closure of this Highway.

Design and operation of the landfill are rudimentary by modern standards and many aspects of the operation are unsatisfactory. Operation of the landfill is often in breach of the conditions of the discharge permits. The most significant risk posed from this landfill is that of contaminated leachate from the landfill entering Waitangi Stream. As access to the landfill can be gained unsupervised, it is possible that unsuitable and potentially dangerous or hazardous material may be placed in the landfill

### **8.5.4 Options to Address Potential Risks**

The NZ Army is currently working with the contractors in attempts to improve the performance of the landfill. If performance cannot be improved NZ Army will close the landfill.

## **8.6 WATER SERVICES - WAIOURU**

### **8.6.1 Water Supply**

#### **(a) Services Provided in Waiouru Township**

The NZ Army operates a water treatment plant serving both the military and civilian communities of Waiouru. Services to the general community are provided by arrangement with Ruapehu District Council.

The Water Treatment Plant consists of an intake weir on Waiouru Stream (approximately 2km east of the Waiouru Township. The intake is operated under a water extraction permit issued by Horizons Regional Council. This permit provides for a maximum of 5455m<sup>3</sup> of water to be taken per day. This consent expires in 2020. An alternative supplementary supply weir is operated on Waitangi Stream, also pursuant to a water extraction consent issued by Horizons Regional Council. This consent also expires in 2020 and provides for 5455m<sup>3</sup> of water to be taken per day.

The water treatment plant was built in the 1970's and underwent a control / monitoring equipment upgrade in 2002. This plant provides filtration, chlorination, and pH correction. Contractors operate the plant on behalf of the NZ Army. The plant's performance is regularly monitored and consistently achieves compliance with the New Zealand Drinking Water Standards 2000. Daily production is approximately 1800m<sup>3</sup>.

Once treated water is pumped to two storage reservoirs with a combined capacity of 4,500m<sup>3</sup> (3-5 days supply), from where it gravitates through the Army and RDC reticulation systems.

**(b) Future Demand**

The system has adequate capacity for the population it currently serves. The Water treatment plant is designed to serve a population of 5,000. The existing population served is approximately 3,000.

The township's population has declined over previous years and it is not considered that there will be any significant increase in the population during the period covered by this report. Consequently it is not expected that there will be any greater demand for water supply during this period.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of an impact / probability matrix to establish a risk profile for each issued. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, the following issues have been identified as being potential high risks to the provision of safe drinking water to the consumers in the Waiouru Township

- Contamination of the water supply in the distribution system resulting from unsafe or inadequate maintenance procedures or cross contamination from backflow.

It is considered that the community are not at risk of contracting water borne diseases from drinking treated water supplied to the Waiouru Township by the Army.

**(d) Options to Assess Future Demand, Public Health, and Environmental Issues**

Apart from normal ongoing maintenance it is not expected that any additional upgrade work is required to cater for any additional demand at this stage.

**(e) Preferred Council Response**

As the water supply scheme presents no significant risk to public health or the environment, Council intends to maintain the reticulation network at its current status. As the water scheme presents no significant risks to the NZ Army, they do not propose any additional works to this scheme.

**8.6.2 Sewerage****(a) Services Provided in the Waiouru Township**

The Rangitikei County Council constructed the Waiouru sewage system in the late 1960's. The system services that part of Waiouru now under the control of the Ruapehu District Council. Sewage collected is pumped to the treatment plant operated and owned by the Army Training Group.

The reticulation consists of about 1,650 metres of 150mm diameter mainly asbestos cement gravity main, which conveys the collected sewage from around the township to two pump stations, situated on Ruanui Street and Andrews Drive.

The Army Museum also pumps its sewage to the reticulation. However this pump is privately owned.

The Andrews Drive sewer pump station is a usual wet well/submersible pump type facility equipped with Robot submersible pumps set up in a duty/standby configuration. Collected sewage is pumped into the army's reticulation on Andrews Drive for treatment and disposal at their treatment facility.

The NZ Army operate a wastewater treatment plant that services both military and civilian communities. The treatment plant consists of a series of mechanical and biological treatment processes. Treated effluent from the plant flows through a pipeline for about 70m before discharging into an open drain that cascades down a steep cliff face and across 70m of New Zealand Defence Force land before reaching the Waitangi Stream. This discharge has been operating for many years. Daily average flow through the plant is 1800m<sup>3</sup>.

The Treatment Plant was built in the mid 1950's and is currently operated under a discharge permit issued in 1999 by Horizons Regional Council, which expired in May 2004. NZ Army has lodged an application for a new consent and is currently engaged in concept design and consultation for an upgraded treatment plant and a more culturally acceptable form of effluent discharge.

**(b) Future Demand**

The population of Waiouru is not expected to increase significantly in the near future. The Sewage Treatment Plant was designed to serve a population of 5,000. the existing population served is approximately 3,000. Consequently the existing sewage system is considered to be sufficient to cater for the needs of the community during the period covered by this report.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of an impact / probability matrix to establish a risk profile for each issued. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. The Waiouru sewage system has functioned without any major problems and is not considered to pose any health risk to the residents of the township. However the treatment plant is old and has not been adequately maintained for many years. The plant is also under-loaded. This causes some operational issues.

**(d) Options To Address Future Demand, Public Health, And Environmental Issues**

There are no issues that have been identified that threaten public health or the environment. The NZ Army intends to upgrade the treatment plant in association with obtaining new resource consents. It is hoped that this will address the deferred maintenance issues and provide effluent re-circulation to address problems arising from under loading of the plant.

**(e) Preferred Council Response**

As the sewerage scheme presents no significant risk to public health or the environment, Council intends to maintain the network at its current status.

**8.6.3 STORMWATER****(a) Services Provided in the Waiouru Township**

There is a system of piped stormwater drains that convey stormwater away from the Waiouru Township area and discharge into various open drains or nearby watercourses. These drains have received minimal maintenance by Council in the past but increased maintenance in recent years has improved drainage in the township to some extent.

Maps produced by Horizons Regional Council show that the estimated flood levels would not seriously impact on the Waiouru township in an event having a 1% Annual Exceedence Probability (AEP) (100 year flood).

**(b) Future Demand**

Apart from continued maintenance of the stormwater network, it is considered that the existing network is adequate for the discharge of stormwater from the township under normal circumstances.

**(c) Risk Assessment**

A generic risk assessment has been carried out for water supply schemes. A quantitative risk assessment has been undertaken making use of an impact / probability matrix to establish a risk profile for each issue. Those risks that attracted a profile of 6 or higher have been addressed in this assessment. From the risk assessment process that is provided in Appendix 1, there were no issues identified for the disposal of stormwater that attracted a profile of 6 or higher. It is not considered that the current stormwater collection and disposal system presents a significant public health risk to residents.

**(d) Options to address future demand and public health issues**

Although no issues have been identified with the stormwater network in Waiouru, the following options have been identified for the future of this system:

- Improved maintenance of the stormwater system,
- Piping of all remaining sections of open drains,
- Status quo.

**(e) Preferred Council Response**

As the current stormwater system provides a low level of risk to the Waiouru community and its environment, it is recommended that this system be maintained at its current status.

## **8.7 NON-SERVICED RESIDENTS IN RURAL AREAS**

### **8.7.1 Systems in non-serviced rural areas**

Council recognises that residents in rural areas of the district rely on roof tanks, springs or bores for water supply and on septic tanks for sewage treatment and disposal.

### **8.7.2 Risk Assessment**

The risks and effects of roof tanks, springs or bores and septic tanks used by residents in non-serviced communities in rural areas would be the same as those identified for other communities such as rural schools and Marae.

## **9.0 CONCLUSION**

### **9.1 INTRODUCTION**

- 9.1.1 The purpose of this assessment is to provide information to the various communities of the Ruapehu District of the current status of the water and sanitary services that they are provided with, and the risks (both environmental and to public health) associated with these services.
- 9.1.2 In the situation where there are risks associated with the provision or receipt of particular services Council has identified its preferred option for the future of the service.
- 9.1.3 Information on non-council provided services was sourced (where possible) from key stakeholders in the District such as the Department of Conservation and the Ministry of Defence.
- 9.1.4 It is hoped that by providing communities with information on these services, members of the public will have the information that they need to provide Council with their opinions on the future development and provision of water and sanitary services within the Ruapehu District.
- 9.1.5 Following a period of consultation, the comments received from the community in relation to this assessment will be incorporated into this assessment (where necessary) and any necessary implementation or change in work programme will be further investigated as part of Council's scheduled review of Asset Management Plans in 2006.
- 9.1.6 The following sections provide an overview of Council's water and sanitary services and outline the possible futures of these services.

### **9.2 CEMETERIES**

- 9.2.1 There are little to no risks or issues associated with the provision of cemeteries within the District. The majority of Council maintained cemeteries have more than adequate capacity to meet any expected future demand.
- 9.2.2 There is a moderate possibility of demand exceeding capacity in the Taumarunui New and Raetihi cemeteries within the next 25 years. The available capacity will be monitored to enable Council to address the possibility of requiring new cemeteries at least five - eight years before these cemeteries are full.

### **9.3 PUBLIC TOILETS**

- 9.3.1 Public toilets are an important asset to a District that aims to attract increased tourism. It is important that these facilities are not only adequate for the needs of their potential users but also that they are in appropriate locations and have adequate capacity for the number of users they receive.
- 9.3.2 There is the possibility of capacity not being able to meet demand in the Main Street toilet facilities of Taumarunui, Ohakune, and Waiouru within the next 10 years.

- 9.3.3 It is recommended that demand on these facilities should be monitored through surveys of usage every two years at existing facilities. This will provide Council with information necessary to plan for either reconfiguration of existing facilities or development of additional facilities.
- 9.3.4 It is recognised that additional public toilet facilities may be required to service the new walking track proposed for the Old Coach Road, Ohakune. This requirement will need to be assessed when the walking track is in operation. The assessment of the necessity for this facility will be carried out in conjunction with the Department of Conservation.

## **9.4 SOLID WASTE**

- 9.4.1 The provision of solid waste services is considered to be a core function of Council. The configuration of services provided is reviewed following public consultation every three years in Council's Solid Waste Management Plan (SWAMP).
- 9.4.2 There have been several issues raised in this Assessment in relation to the risks associated with the provision of Council's solid waste services. The majority of these risks are primarily related to uncontrolled access to a number of Council's transfer stations. This causes concern as in this situation it is easy for dangerous, hazardous, or non-conforming refuse to enter the District landfill. The potential consequences from this are large, both financially and environmentally.
- 9.4.3 The Ruapehu community has often communicated to Council that they wish to live in an environmentally sustainable District. This is evidenced by the steadily increasing amounts of recycling undertaken by members of the public. This increase in the volumes recycled is putting pressure on the capacity of some sites.
- 9.4.4 The issues highlighted in this Assessment in relation to solid waste services will be considered as part of the SWAMP review in 2006.

## **9.5 WATER SUPPLY**

- 9.5.1 The Ruapehu Community is serviced by a range of water supply schemes from a variety of Council operated supplies, to small community operated supplies, to roof tank or spring fed schemes. The quality and level of risk associated with these schemes varies considerably.
- 9.5.2 Council signalled to the community in the Future Ruapehu Long Term Plan 2004-2014 that Council aims to comply with legislative minimum standards for water supply. In anticipation of new standards, Council has programmed an upgrade programme to ensure that all Council provided water supply schemes would meet these standards. It should be noted that Council would not undertake this programme until the anticipated standards become law. Completion of this upgrade programme would address the majority of issues raised in this Assessment in regards to Council provided water schemes.
- 9.5.3 Council also signalled in the Future Ruapehu Long Term Plan 2004-2014 that should the Ohura Prison be closed that Council would begin the procedure to exit from the provision of water to the Ohura community. This would require

the community to establish their own supply. The financial viability of the Ohura water supply system has been in question for a number of years, and in light of the expected changes in legislation, which will further increase costs to the Ohura community, Council sees closure of this scheme as the most appropriate response. The procedure to exit a small water scheme includes:

- (a) Making public the view of the Medical Officer of Health on the closing of the scheme, and
- (b) Holding a binding referendum and gaining 75% support for the proposal.

9.5.4 This Assessment has also highlighted the risks associated with roof tank and other supplies of this nature. Often users of these services are not aware of the risks they are exposed to in regards to water borne diseases. It is recommended that Council undertake a public awareness programme on the appropriate care and maintenance of these water schemes. Areas of particular concern are systems that service schools and marae as these systems service a greater number of people and therefore have a higher level of risk.

## **9.6 SEWERAGE**

9.6.1 Council operates 6 sewerage schemes within the District. These schemes differ in the quality of the treated effluent. Council aims to manage this service in a sustainable manner with the least possible impact on the environment and public health.

9.6.2 The Ohakune sewage treatment plant is currently operating without a discharge permit and has done since March 1992. Horizons Regional Council is currently processing Council's application for a discharge permit.

## **9.7 STORMWATER**

9.7.1 Council provides only limited reticulated stormwater infrastructure with the majority of the District being serviced by a system of natural watercourses and open drains. Although the systems of natural watercourses and open drains provide little risk to the environment or public health, several urban communities have expressed desires to have these open drains enclosed and piped.

9.7.2 Council recognises that this is desirable for aesthetic reasons, however due to questions of community affordability only a limited piping programme will occur. In general Council intends to maintain the stormwater network at its current level of service.

## APPENDIX 1 RISK ASSESSMENT

### 1.0 Introduction to Risk Assessment

- 1.1 Using the context of public health, a risk analysis has been undertaken for all Council services included in this assessment.
- 1.2 the risk analysis has only been undertaken for services operated and / or maintained by Council. No analysis has been undertaken for privately owned services or those provided by other organisation
- 1.3 The risk assessment considers risks, the impact on public health and the environment of those risks, the likelihood of a risk event occurring and the method of risk prevention, mitigation, transfer, or, where no action is possible, or practical risk acceptance.
- 1.4 The risk assessment used was based on the guidelines produced by Standards New Zealand the above guidelines can be viewed by consulting the: AS/NZS 4360:1990 Risk Management standard. This document is a guideline only providing information on both quantitative and qualitative risk management practices. In compiling the water and sanitary services review a qualitative risk analysis was used.

### 2.0 Risk Profile

- 2.1 The following risk profile has been used and only scores of 5 or greater than 5 have been considered for risk management action.

Total Score	Ranking	Management
(5), 6, 7, 8	Major Risk	Imperative to suppress risk to lower level
4, (5)	Medium Risk	Corrective action required in a reasonable time frame
Less than 4	Low Risk	Corrective action (if any) where practicable

Table 19: Risk Profile

### 3.0 Measures of Impacts or Consequences

- 3.1 The following table provides descriptions of the classification description system use to calculate the potential impact of the risk

Level	Descriptor	Public Health/Social/Cultural	Environmental
7	Catastrophic	Multiple fatalities, widespread community outrage, adverse global or national media coverage	Catastrophic environmental harm with prosecution and/or imprisonment.
6	Very High Impact	Single fatality or extensive injuries, high profile community concerns with significant decrease in community support.	Major environmental harm and long-term recovery, heavy fine.

Level	Descriptor	Public Health/Social/Cultural	Environmental
5	Major	Serious health impact to multiple people; community complaints reflecting moderate level of community concern, adverse local media coverage.	Measurable environmental harm, some legal constraints imposed.

Table 20a: Description & Classification

4	Minor	Serious health impact to a single person requiring first aid or hospitalisation, some community complaints reflecting minor level of community concern.	Slight and quickly reversible damage to a few species/ecosystems, minor technical challenge.
3	Negligible	Transient health impact, issues reflecting insignificant level of community concern.	Short term, minor environmental impact.

Table 20b: Description & Classification

#### 4.0 Measure of Probability or Risk of Event Occurring

4.1 The following table provides the description used to calculate the probability of any particular risk or event of occurring.

Level	Descriptor	Description	Frequency value
1	Almost Certain	Likely to occur frequently and on a regular basis	>90%
0	Likely	Likely to occur several times	50-90%
-1	Moderate	May occur several times	10-50%
-2	Remote	Unlikely, but distinctly possible	1-10%
-3	Very Unlikely	Very unlikely. May occur in exceptional circumstances.	<1%

Table 21: Description & probability

#### 5.0 Risk Assessment – Cemeteries, Crematoria, and Urupa

5.1 The following table contains the risk assessment matrix of all cemeteries operated by Council within the Ruapehu District.

No	Risk Description	Impact	Probability	Score	Response
1	Major earthquake or land slip, causing exposure of graves.	6	-3	3	All cemeteries are exposed to possible earthquake event. Response dependent on intensity of event.
2	Damage to ground and grave adornments from wandering stock	4	-1	3	Has occurred in the past. Clean up and repair response implemented swiftly.

No	Risk Description	Impact	Probability	Score	Response
3	Damage to headstones by vandalism	4	-1	3	Has occurred in the past. Family contacted and repair response implemented swiftly.
4	Major volcanic event causing damage.	4	-1	3	All cemeteries exposed to possible damage from Mount Ruapehu eruption. Response dependent of intensity of event.

Table 22a: Cemeteries, Crematoria and Urupa Risk Assessment Matrix

5	Underground water tables affecting open gravesites.	3	0	3	Has occurred in the past. Affected areas identified on cemetery maps and plots withdrawn from availability, restricted to single depth or indemnity forms obtained and graves pumped clear of water prior to interment.
6	Poor drainage of site causing ground slumpage.	3	-1	2	Affects Manunui Cemetery only. Water table level to be lowered by improving drainage.
7	Health and Safety issues in open plot situations.	3	-3	0	
8	Population growth exceeding capacity.	3	-2	1	Affects Raetihi Cemetery only. Council owns adjoining land that could be developed, although it is expensive to do so.
9	Illegal burials without Council knowledge.	5	-3	2	Would involve Police forensics to deal with situation once illegal burial identified.

Table 22b: Cemeteries, Crematoria and Urupa Risk Assessment Matrix

## 6.0 Risk Analysis – Public Toilets

6.1 The following table contains the risk assessment matrix of all public toilets operated by Council within the Ruapehu District.

No	Risk Description	Impact	Probability	Score	Response
1	Major earthquake destroying facilities.	6	-3	3	Reconstruct new facilities. Place portable “portaloo” type facilities in key areas temporarily.

No	Risk Description	Impact	Probability	Score	Response
2	Major volcanic event causing damage.	5	-2	3	Repair or reconstruct new facilities. Place portable "portaloos" type facilities in key areas temporarily.
3	Major damage or destruction by vandalism	4	-2	2	Has occurred in the past. Facilities all have replacement insurance cover to enable prompt reinstatement. Usually confined to isolated units not full facility.

Table 23a: Public Toilet Risk Assessment Matrix

4	Loss of water to high use facilities > 24 hours	3	0	3	If at all, only several towns likely to be affected at one time. No immediate response considered necessary. Additional cleaning as necessary on restoration of water.
5	Loss of water to high use facilities > 7 days	5	-2	3	If at all, only several towns likely to be affected at one time. Supply and placement of portable units temporarily.
6	Customer contracting infectious disease through unclean facilities (proven).	7	-2	5	Termination of existing cleaning contract and implementation of more stringent regimes and cleaning audit procedures.
7	Health and Safety Issues eg slippery floors in wet conditions.	4	0	4	Immediate response with cleaning and signage.
8	Population or tourist growth exceeding capacity.	4	-2	2	Council to keep aware of capacity issues and consider construction of new or extended facilities if required.

Table 23b: Public Toilet Risk Assessment Matrix

## 7.0 Risk Analysis - Solid Waste

7.1 The following tables contains the risk assessment matrix for the 3 types of transfer station operated by Council within the Ruapehu District. Section 7.5 contains the risk assessment for Council's landfill.

7.2 Large Transfer Stations

No	Risk Description	Impact	Probability	Score	Response
1	Breach of Resources Management Act	7	-1	6	Attend site and education programme.
2	Odour beyond property boundary	5	0	5	Education programme and service site.
3	Noise nuisance	4	-2	2	
4	Dust nuisance	4	-1	3	
5	Vermin	6	-2	4	Manage Vector programme
6	Drainage	4	-1	3	
7	Flooding	4	-1	3	
8	Fire	5	-2	3	
9	Earthquake	5	-2	3	

Table 24a Large Transfer Stations Risk Assessment Matrix

10	Isolation of the site	4	1	5	
11	Hazardous waste	7	1	8	Attend site and education programme.
<b>Operational</b>					
12	Health and Safety	7	-2	5	Ensure appropriate signage, Education campaign, establish and maintain operations plan.
13	Capacity for all items at transfer station	6	0	6	Attend site, expand or seek new site, education programme
14	Uncontrolled sites and non-conforming material	5	1	6	Attend site, education programme
15	Vandalism	5	-2	3	
16	Increasing operational costs due to public abuse	5	1	6	Attend site
17	Contractor walk out	4	-3	1	
18	Population growth	4	1	5	Attend site, expand or seek new site, education programme
19	Servicing due to weather				See isolation of site
20	Cultural issues	5	-2	3	
21	Power failure	3	-2	1	
22	Water supply loss	3	-2	1	

Table 24b Large Transfer Stations Risk Assessment Matrix

7.3 Rural Transfer Stations

No	Risk Description	Impact	Probability	Score	Response
1	Breach of Resource Management Act	6	-1	5	Attend site and education programme.
2	Odour beyond property boundary	5	0	5	Education programme and service site.
3	Noise nuisance	4	-2	2	
4	Dust nuisance	4	-1	3	
5	Vermin	6	-2	4	Manage Vector programme
6	Drainage	4	-1	3	
7	Flooding	5	-1	4	
8	Fire	5	-2	3	
9	Earthquake	5	-2	3	
10	Isolation of the site	4	-1	3	

Table 25a Rural Transfer Stations Risk Assessment Matrix

11	Hazardous waste	7	1	8	Attend site and education programme.
	<b>Operational</b>				
12	Health and Safety	7	-2	5	Ensure appropriate signage, Education campaign, establish and maintain operations plan.
13	Capacity for all items at transfer station	5	0	5	Attend site, expand or seek new site, education programme
14	Uncontrolled sites and non-conforming material	5	1	6	Attend site, education programme
15	Vandalism	5	-2	3	
16	Increasing operational costs due to public abuse	5	-1	4	
17	Contractor walk out	4	-3	1	
18	Population growth	3	-2	1	
19	Servicing due to weather				See isolation of site
20	Cultural issues	5	-2	3	
21	Power failure	3	-2	1	
22	Water supply loss	3	-2	1	

Table 25b Rural Transfer Stations Risk Assessment Matrix

7.4 Attended Transfer Stations

No	Risk Description	Impact	Probability	Score	Response
1	Breach of Resource Management Act	5	-2	3	Attend site and education programme.
2	Odour beyond property boundary	5	-1	4	Education programme and service site.
3	Noise nuisance	4	-1	3	
4	Dust nuisance	4	-1	3	
5	Vermin	6	-2	4	Manage vector programme
6	Drainage	4	-1	3	
7	Flooding	4	-1	3	
8	Fire	5	-2	3	
9	Earthquake	5	-2	3	
10	Isolation of the site	4	1	5	

Table 26a Attended Transfer Stations Risk Assessment Matrix

11	Hazardous waste	6	-2	4	Attend site and education programme.
<b>Operational</b>					
12	Health and Safety	6	-2	4	Ensure appropriate signage, Education campaign, establish and maintain operations plan.
13	Capacity for all items at transfer station	6	0	6	Attend site, expand or seek new site, education programme
14	Uncontrolled sites and non-conforming material	5	-2	3	Attend site, education programme
15	Vandalism	5	-2	3	
16	Increasing operational costs due to public abuse	5	-1	4	Attend Site
17	Contractor walk out	4	-3	1	
18	Population growth	5	1	6	
19	Servicing due to weather				See isolation of site
20	Cultural issues	5	-2	3	
21	Power failure	3	0	3	
22	Water supply loss	3	0	3	

Table 26b Attended Transfer Stations Risk Assessment Matrix

**8.0 Risk Analysis – Water Service**

8.1 The following tables contain the risk assessment matrix for the 3 types of water service operated by Council within the Ruapehu District.

8.2 Water Supply

No	Risk Description	Impact	Probability	Score	Response
<b>Source</b>					
1	Lack of water at source	6	-2	4	
2	Contamination of source water	6	-1	5	Take steps to ensure source is protected from contamination
3	Intake/source damaged or destroyed by floods or earthquake	6	-2	4	
4	Damage to raw water supply main	6	-1	5	Take steps to ensure raw water main is protected from damage
5	Vandalism	6	-1	5	
<b>Treatment</b>					
6	Treatment plant unable to supply demand	6	-2	4	
7	Contamination of water during treatment process	7	-2	5	Ensure correct procedures are followed
8	Failure of treatment process	4	-1	3	
9	Failure of process equipment	4	-1	3	
10	Failure of disinfection equipment	5	-1	4	
11	Failure of pumping equipment	5	-2	3	
12	Insufficient treatment chemicals	5	-2	3	
13	Damage to treatment plant by flooding	5	-2	3	
14	Damage to treatment plant by fire	6	-1	5	Ensure sufficient fire fighting equipment is available
15	Damage to treatment plant by earthquake etc	5	-3	2	
16	Power failure - short duration <1 hr	3	0	3	

No	Risk Description	Impact	Probability	Score	Response
17	Power failure - long duration >24 hr	5	-1	4	

Table 27a Water Supply Risk Assessment Matrix

18	Vandalism	6	-1	5	Ensure treatment facility is secured against unauthorised access
<b>Storage</b>					
19	Insufficient storage capacity	5	-2	3	
20	Damage to storage tank by earthquake	6	-2	4	
21	Damage to storage tank by fire	6	-3	3	
22	Contamination of stored water	7	-2	5	Ensure storage facility is secured against contamination
23	Insecure storage facility	7	-1	6	
24	Inadequate maintenance procedures	5	-2	3	
25	Vandalism	7	-2	5	Ensure storage facility is secured against unauthorised access
<b>Distribution</b>					
26	Distribution system incapable of supplying demand	4	-1	3	
27	Distribution system prone to breakages causing loss of supply	5	-1	4	
28	Damage to property from broken mains	4	-1	3	
29	Contamination of supply from backflow	7	-2	5	Ensure appropriate measures are taken to prevent backflow
30	Contamination of supply from inadequate maintenance procedures	7	-1	6	Ensure appropriate maintenance procedures are followed
31	Loss of supply due to inadequate knowledge of system	4	-1	3	
32	Inappropriate materials	4	-2	2	

	used during construction of distribution system				
33	Inadequate or inappropriate maintenance procedures	4	-2	2	
34	Inadequate monitoring programme or procedures	7	-2	5	Ensure appropriate monitoring procedures and programme are followed
35	Vandalism	5	-2	3	

Table 27b Water Supply Risk Assessment Matrix

<b>Other</b>					
36	Default by contractor	6	-3	3	
37	Health and Safety issues onsite	6	-2	4	
38	Increasing operational costs	4	-1	3	
39	Unexpected or unplanned population growth	4	-2	2	
40	Climatic change	3	-2	1	
<b>Environmental</b>					
1	Breach of Resource Consent conditions	5	-1	4	
2	Accidental discharge of hazardous chemicals	7	-2	5	Ensure chemical storage area is properly bunded and secured
3	Cultural issues	3	-1	2	
4	Noise nuisance	4	-3	1	
5	Vermin problems	4	-2	2	

Table 27c Water Supply Risk Assessment Matrix

8.3 Sewerage

No	Risk Description	Impact	Probability	Score	Response
<b>Collection System</b>					
1	Reticulation inadequate to carry peak flows	5	-1	4	
2	Overflows from manholes or gully traps	4	-1	3	

No	Risk Description	Impact	Probability	Score	Response
3	Excessive groundwater infiltration	4	1	5	Undertake investigations to determine source of infiltration & attempt to reduce/eliminate
4	Reticulation prone to blockages or breaks	5	-1	4	
5	Inadequate or inappropriate maintenance procedures	5	-2	3	
6	Insecure manhole covers	6	-2	4	
7	Unrestricted access to manholes	6	-3	3	

Table 28a Sewerage Risk Assessment Matrix

8	Vandalism	4	-2	2	
<b>Sewer Pump Stations</b>					
9	Pump station unable to cope with peak flows	5	0	5	Check pump station and pump capacities - reduce inflows
10	Pump failure	4	-1	3	
11	Electrical equipment failure	4	-2	2	
12	Power failure - short duration <1hr	4	-1	3	
13	Power failure - long duration >4 hr	5	-1	4	
14	Damage to pump stn by fire	5	-3	2	
15	Damage to pump stn by earthquake	5	-2	3	
16	Damage to pump stn by flooding	6	-1	5	Protect pump station from flood
17	Unauthorised access to pump station	6	-2	4	
18	Inadequate or inappropriate operation and/or maintenance procedures	5	-2	3	
19	Inadequate backflow prevention	6	-2	4	
20	Vandalism	5	-2	3	

<b>Sewage Treatment</b>					
21	Inappropriate treatment process	6	-3	3	
22	Treatment process unable to cope with inflow	5	-1	4	
23	Inadequate or inappropriate operation and/or maintenance procedures	4	-2	2	
24	Mechanical equipment failure	3	-1	2	
25	Electrical equipment failure	3	-1	2	
26	Failure of other treatment processes	3	-1	2	
27	Power failure - short duration <1hr	3	-1	2	
28	Power failure - long duration >24 hr	4	-2	2	

Table 28b Sewerage Risk Assessment Matrix

29	Damage to treatment facility by flooding	7	-3	4	
30	Damage to treatment facility by earthquake	5	-2	3	
31	Damage to treatment facility by fire	3	-2	1	
32	Failure of disinfection process	5	0	5	Provide alternative backup facility
33	Unauthorised access to treatment facility	6	0	6	Secure treatment facility against unauthorised access
34	Vandalism	5	-2	3	
<b>Discharge/Disposal</b>					
35	Inappropriate discharge/disposal option	6	-1	5	Ensure appropriate discharge/disposal options are utilised
36	Failure of discharge/disposal method	5	-1	4	
37	Damage to discharge structure	4	-1	3	
<b>Other</b>					
38	Default by contractor	3	-3	0	
39	Health and Safety issues onsite	6	-2	4	

40	Increasing operational costs	5	-1	4	
41	Unexpected or unplanned population growth	4	-2	2	
42	Climatic change	3	-2	1	
<b>Environmental</b>					
1	Breach of Resource Consent conditions	7	-1	6	Ensure RC conditions are adhered to
2	Cultural issues	7	-2	5	Ensure cultural issues are recognised and taken into account
3	Odour nuisance	4	-1	3	
4	Noise nuisance	4	-3	1	
5	Vermin problems	4	-2	2	

Table 28c Sewerage Risk Assessment Matrix

8.4 Stormwater

No	Risk Description	Impact	Probability	Score	Response
<b>Collection System</b>					
1	Reticulation inadequate to carry peak flows	4	0	4	
2	Flooding of property due to inadequacy of system	5	-1	4	
3	Overflows from manholes	4	-1	3	
4	Reticulation prone to blockages or breaks	4	-1	3	
5	Open drains overgrown or not maintained	4	0	4	
6	Deep open drains	4	0	4	
7	Standing water in open drains	4	0	4	
8	Insecure manhole covers	5	-2	3	
9	Unguarded access to large culverts	5	0	5	Ensure access to large culverts are protected
10	Unrestricted access to manholes	5	-2	3	
11	Inadequate or inappropriate maintenance procedures	4	-2	2	
12	Damage to reticulation by earthquake	5	-2	3	
13	Vandalism	4	-2	2	
<b>Discharge/Disposal</b>					
14	Inappropriate discharge/disposal option	4	-2	2	
15	Failure of discharge/disposal method	4	-2	2	
16	Damage to discharge structure	3	-1	2	
17	Damage to property from discharge	5	-2	3	

Table 29a: Stormwater Risk Assessment Matrix

<b>Other</b>					
18	Default by contractor	3	-3	0	
19	Health and Safety issues onsite	6	-2	4	
20	Increasing operational costs	5	-1	4	
21	Unexpected or unplanned population growth	4	-2	2	
22	Climatic change	5	-2	3	
<b>Environmental</b>					
1	Breach of Resource Consent conditions	5	-3	2	
2	Cultural issues	5	-2	3	
3	Odour nuisance	4	-2	2	

Table 29b: Stormwater Risk Assessment Matrix

## APPENDIX 2 COMPONENT INVENTORY – PUBLIC TOILETS

1.0 The following tables provide information as to the components that make up Councils public toilet facilities throughout the District.

### 2.0 Ohura Ward

#### 2.1 Tui Street, Ohura

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete – (tank like construction)	
Roofing Material	Concrete (part of tank construction)	
Spouting	None	
Windows	None	
Lighting	None	
Water Meters	None	
Doors / Locks	None	
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless Steel	1
Bowls	Ceramic Standard	1
Cisterns	Dux	1
Hand Basins	Stainless Steel	1
Doors	Wood	1
Toilet Roll Holders	Wood	1
Soap Dispensers	None	
Toilet Door Locks	Steel	2
Lighting	One Standard	1
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic Standard	1
Cisterns	Dux	1
Hand Basins	Stainless Steel	1
Door	Wood	1
Toilet Roll Holders	None	
Soap Dispensers	None	
Toilet Door Locks	Steel	1
Lighting	None	

Table 30a: Tui Street Ohura

**3.0 Taumarunui Ward**

**3.1 Hakiaha Street**

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete, painted	NA
Roofing Material	Corrugated roofing iron, painted. Skylight roofing	NA
Spouting	Iron, plastic down piping painted.	NA
Windows	N/A	NA
Lighting	Skylight Roofing 100w wall mounted vertical lighting.	2
Water Meters	-	1
Doors / Locks	Hinged steel bars, padlock. Standard door lock.	2 1
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Ceramic Tiles	NA
Urinals	Stainless Steel	3
Bowls (includes 1 disabled unit)	Stainless Steel plastic seating	3
Cisterns	Protective Wooden Casing	3
Hand Basins	Stainless Steel Press top taps	3
Partitioning	Aluminium Concrete	2 1
Toilet Roll Holders	Plastic, Hygenex	3
Soap Dispensers	Plastic, NZTS	1
Air Towels		2
Toilet Door Locks	Indicator Locks	3
Lighting	Skylight roofing Ceiling mounted fluorescent light 100W wall mounted vertical lighting.	1 1
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Ceramic Tiles	NA
Bowls (includes 1 disabled unit)	Stainless Steel Plastic Seating	3
Cisterns	Protective Wooden Casing	3
Hand Basins	Stainless Steel Press top taps	3
Partitioning	Aluminium Concrete	2 1
Toilet Roll Holders	Plastic, Hygenex	3
Soap Dispensers	Plastic NZTS	1
Air Towels		2
Toilet Door Locks	Indicator Locks	3
Lighting	Skylight Roofing. Ceiling mounted fluorescent light. 100W wall mounted vertical lighting	1

Table 31a: Hakiaha Street

<b>UNISEX</b>		
<u>Interior</u>		
Flooring Material	Ceramic Tiles	NA
Bowls	Stainless Steel, Plastic Finishing	1
Cisterns	Protective Wooden Casing,	1
Hand Basins	Stainless Steel Press top taps	1
Partitioning	Aluminium None	1
Toilet Roll Holders	Plastic Hygenix	1
Soap dispensers	Plastic NZTS	1
Air Towels		1
Toilet Doors/Locks	Indicator Locks	1
Lighting	Skylight Roofing 100W wall mounted vertical lighting	1

Table 31b: Hakiaha Street

3.2 Taumarunui Domain

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete brick, painted	NA
Roofing Material	Corrugated roofing iron, painted.	NA
Spouting	Iron down piping painted.	NA
Windows	Gaps under roofing provide adequate lighting (during the day).	NA
Lighting	NA	-
Water Meters	NA	-
Doors / Locks	Hinged steel bars, padlock.	2
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless Steel, Mercer	1
Bowls (includes 1 disabled unit)	Ceramic with plastic seating	1
Cisterns	Protective wooden casing	1
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Wood Painted	1
Toilet Roll Holders	Metal, Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	No locks, doors are spring loaded	1
Lighting	None	-
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls (includes 1 disabled unit)	Ceramic with Plastic Seating	3
Cisterns	Protective wooden casing	3
Hand Basins	Stainless Steel, Twist top taps	1

Table 32a: Taumarunui Domain

<b>WOMANS</b>		
<u>Interior</u>		
Partitioning	Wood Painted	2
Toilet Roll Holders	Metal, Hygenex	3
Soap Dispensers	None	-
Toilet Door Locks	None, Doors spring loaded	3
Lighting	None	-

Table 32a: Taumarunui Domain

3.3 Cherry Grove Domain, Taumarunui

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete brick, painted, pine bracings	NA
Roofing Material	Corrugated roofing iron, painted.	NA
Spouting	Marley plastic down piping, painted	NA
Windows	Skylight roofing panels	4
Lighting	NA	-
Water Meters	NA	-
Doors / Locks	Spring loaded gate waste high.	2
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	None	-
Bowls	Stainless Steel with plastic seating	2
Cisterns	Protective wooden casing	2
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Concrete and Wood	1
Toilet Roll Holders	Metal, Rollfast	2
Soap Dispensers	None	-
Toilet Door Locks	Doors are spring loaded. Sliding bolt on smaller cubicle	1
Lighting	None	-
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Stainless Steel with plastic seats	2
Cisterns	Protective wooden casing	2
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Concrete and Wood	1
Toilet Roll Holders	Metal, Rollfast	2
Soap Dispensers	None	-
Toilet Door Locks	Doors spring loaded, Sliding bolt on smaller cubicle	1
Lighting	None	-

Table 33a: Cherry Grove Domain, Taumarunui

3.3 Manunui River Reserve

<b>Exterior</b>		<b>Quantity</b>
<u>Material</u>		
Structure Material	Wooden Painted	NA
Roofing Material	Corrugated roofing iron, painted.	NA
Spouting	Iron Downpiping, painted	NA
Windows	Gaps under roofing provide adequate day time lighting	NA
Lighting	NA	
Water Meters		1
Doors / Locks		2
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	None	-
Bowls	Ceramic with plastic seating	1
Cisterns	Wooden	1
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Wood Painted	1
Toilet Roll Holders	Metal, Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	Doors are spring loaded.	1
Lighting	None	-
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic with plastic seats	3
Cisterns	Protective wooden casing	3
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Wood Painted	2
Toilet Roll Holders	Metal, Hygenex	3
Soap Dispensers	None	-
Toilet Door Locks	Doors spring loaded	3
Lighting	None	-

Table 43a: Manunui River Reserve

4.0 **National Park Ward**4.1 National Park Village

<b>Exterior</b>		<b>Quantity</b>
<u>Material</u>		
Structure Material	Concrete brick, painted	NA
Roofing Material	Long run flat profile corrugated roofing iron.	NA
Spouting	Marley plastic downpiping	NA
Windows	Aluminium framed windows	2
Lighting	11 Watt ceiling mounted at toilet entrances male and female.	2
Water Meters	NA	-
Doors / Locks	Steel Door Locks	2

Table 44a: National Park Village

<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	None	-
Bowls	Ceramic with plastic seating	1
Cisterns	Protective wooden casing	1
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	None	-
Toilet Roll Holders	Metal, roll fast. Metal Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	Steel	1
Lighting	4 x Dragon 11 watt fluorescent	4
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic with plastic seats	2
Cisterns	Protective wooden casing	2
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	None	-
Toilet Roll Holders	Metal, Rollfast. Metal Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	Steel	3
Lighting	4 x Dragon 11 watt fluorescent	4

Table 44b: National Park Village

## 5.0 Waimarino Ward

### 5.1 Clyde Street Ohakune

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete brick, painted	NA
Roofing Material	Roofing iron painted	NA
Spouting	Metal downpiping painted	NA
Windows	Bricks with holes are used for windows on the rear of the building. Polycarbonate windows are located on the front of the building	2 2
Lighting	110W vertical wall mounted lighting	5
Water Meters	NA	
Doors / Locks	None	2
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless Steel	1
<b>MENS</b>		
<u>Interior</u>		
Bowls	Stainless Steel with plastic seating	1
Cisterns	Plastic casing	1
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Aluminium	-
Toilet Roll Holders	Plastic, Initial Healthcare	1

Table 45a: Clyde Street Ohakune

Soap Dispensers	Plastic	1
Toilet Door Locks	Steel	1
Lighting	Sealed unit	1
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Stainless steel with plastic seats	2
Cisterns	Plastic	2
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	Aluminium	-
Toilet Roll Holders	Plastic, Initial Health Care	2
Soap Dispensers	Plastic	1
Toilet Door Locks	Steel	2
Lighting	Sealed Unit	1

Table 45b: Clyde Street Ohakune

5.2 Conway Street, Ohakune (Disabled Toilets)

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete brick, painted	NA
Roofing Material	Roofing iron painted	NA
Spouting	Plastic	NA
Windows	None	-
Lighting	110W vertical wall mounted lighting	1
Water Meters	NA	-
Doors / Locks	Two spring loaded doors	2
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless Steel	1
Bowls	Stainless Steel	1
Cisterns	None – Completely recessed	-
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	None	-
Toilet Roll Holders	Metal, Hygenex	1
Soap Dispensers	None	1
Toilet Door Locks	Steel	1
Lighting	Sealed unit	1

<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Stainless steel	1
Cisterns	None (Completely recessed)	-
Hand Basins	Stainless Steel, Twist top taps	1
Partitioning	None	-
Toilet Roll Holders	Metal, Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	Steel	1
Lighting	Sealed Unit	1

Table 46a: Conway Street, Ohakune (Disabled Toilets)

5.3 Ohakune Railway Station

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Weatherboard	NA
Roofing Material	Corrugated Iron	NA
Spouting	Galvanised iron	NA
Windows	Wooden	-
Lighting	None	-
Water Meters	None	-
Doors / Locks	Wooden tongue and groove with lever handles lockable dead locks	
<b>Two Unisex Units</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic standard	2
Cisterns	Completely recessed	2
Hand Basins	Ceramic	1
Doors / Partitions	Solid core wood, ceramic tiled	2
Toilet Roll Holders	Steel	2
Soap Dispensers	Plastic	2
Toilet Door Locks	Steel	2
Lighting	Sealed unit	2

Table 47a: Ohakune Railway Station

5.4 Seddon Street, Raetihi

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Stucco and concrete block	NA
Roofing Material	Corrugated iron.	NA
Spouting	Galv iron painted	NA
Windows	Steel mesh mens and wood/glass womens	-
Lighting	Yes	1
Water Meters	Yes	A
Doors / Locks	Steel bar security door mens, wood/glass door womens	
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless steel	1
Bowls	Ceramic standard	2
Cisterns	Dux	2
Hand Basins	Stainless steel,	1
Doors and partitions	Wood	2
Toilet Roll Holders	Steel Hygenex	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	Two	2

Table 47a: Seddon Street, Raetihi

<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic standard	2
Cisterns	Dux	2
Hand Basins	Stainless steel	1
Doors and Partitions	Pressed steel	1
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	Sealed unit	1

Table 47b: Seddon Street, Raetihi

5.5 Parapara Road, State Highway 4, Raetihi

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete	NA
Roofing Material	Concrete	NA
Spouting	Galv Iron	NA
Windows	None (holes in walls)	
Lighting	Sealed units	
Water Meters	None	
Doors / Locks	None	
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Single stainless steel	1
Bowls	Ceramic standard	1
Cisterns	Dux	1
Hand Basins	None	1
Doors	Tongue and groove wooden	1
Toilet Roll Holders	Steel	1
Soap Dispensers	None	-
Toilet Door Locks	Metal	1
Lighting	None	1
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic standard	1
Cisterns	Wooden	1
Hand Basins	Ceramic, old standard	1
Door	Tongue and groove wood	1
Toilet Roll Holders	Steel	1
Soap Dispensers	None	1
Toilet Door Locks	Metal	1
Lighting	Sealed units	1

Table 48a: Parapara Road, State Highway 4, Raetihi

5.6 Pipiriki

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Marine Ply	NA
Roofing Material	Colour Steel	NA
Spouting	PVC	NA
Windows	Sky lights	
Lighting	None	
Water Meters	AU 189	
Doors / Locks	None	
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless steel	1
Bowls	Stainless steel	1
Cisterns	Stainless steel	1
Hand Basins	Stainless steel	1
Doors / Partitions	Aluminium	1
Toilet Roll Holders	Steel	1
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	None	-
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Stainless steel	2
Cisterns	Stainless steel	2
Hand Basins	Stainless steel	1
Doors / Partitions	Aluminium	2
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	None	-

Table 49a: Pipiriki

5.7 Tangiwai

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete Block	NA
Roofing Material	Corrugated Iron	NA
Spouting	PVC	NA
Windows	Aluminium	
Lighting	None	
Water Meters	None	
Doors / Locks	None	

Table 50a: Tangiwai

<b>MENS</b> <u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	None	-
Bowls	Stainless steel	1
<b>MENS</b> <u>Interior</u>		
Cisterns	Dux	1
Hand Basins	Stainless steel	1
Doors / Partitions	Wood	1
Toilet Roll Holders	Steel, Hygenex	1
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	None	-
<b>WOMANS</b> <u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Stainless steel standard	1
Cisterns	Dux	1
Hand Basins	Stainless steel	1
Doors / Partitions	Wood	1
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	1
Lighting	None	-

Table 50b: Tangiwai

5.8 Ruatiti Domain – Near Camping Area (Long Drop Toilets)

<b>Exterior</b> <u>Material</u>		<u>Quantity</u>
Structure Material	Plywood Toilets sited on tanalised piles	NA
Roofing Material	Opaque corrugated PVC	NA
Spouting	None	NA
Windows	None	
Lighting	None	
Air Vent	PVX	
Water Meters	None	
Doors / Locks	Ply with simple metal internal locks	
<b>MENS</b> <u>Interior</u>		
Flooring Material	Ply, covered with commercial vinyl	NA
Bowls	Stainless steel	1
Seat and Lid	PVC	1
Holding Tank	Steel	1
Doors / Partitions	Ply	1
Toilet Door Locks	Steel	1

Table 51a: Ruatiti Domain – Near Camping Area (Long Drop Toilets)

<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Ply covered with commercial grade vinyl	NA
Bowls	Steel long drop	1
Seat and Lid	PVC	1
Doors / Partitions	Ply	1
Toilet Door Locks	Steel	1

Table 51b: Ruatiti Domain – Near Camping Area (long Drop Toilets)

5.9 Ruatiti Domain, Near Domain Centre (Flush Toilets)

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete Block	NA
Roofing Material	Corrugated iron	NA
Spouting	Galv Iron	NA
Windows	Concrete Block	
Lighting	None	
Water Meters	None	
Doors / Locks	Wood	
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	None	-
Bowls	Ceramic standard	2
Cisterns	Dux	2
Hand Basins	Stainless steel	1
Doors	Wood	2
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	1
Lighting	None	-
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic standard	2
Cisterns	Dux	2
<b>WOMANS</b>		
<u>Interior</u>		
Hand Basins	Stainless steel	1
Doors / Partitions	Wood	2
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	2
Lighting	One	1

Table 52a: Ruatiti Domain, Near Domain Centre (Flush Toilets)

## 6.0 Waiouru Ward

### 6.1 State Highway 1, Waiouru

<b>Exterior</b>		
	<u>Material</u>	<u>Quantity</u>
Structure Material	Concrete Block – Painted	NA
Roofing Material	Corrugated iron	NA
Spouting	Galv Iron – Square section	NA
Windows	Concrete Block – fancy inserts	-
Lighting	Sealed units	3
Water Meters		1
Doors / Locks	None	-
<b>MENS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Urinals	Stainless steel	1
Bowls	Ceramic standard	2
Cisterns	In-wall cavity	2
Hand Basins	Stainless steel	3
Doors / Partitions	Aluminium Steel;	2
Toilet Roll Holders	Steel	2
Soap Dispensers	None	-
Toilet Door Locks	Steel	4
Lighting	Sealed unit	4
<b>WOMANS</b>		
<u>Interior</u>		
Flooring Material	Concrete	NA
Bowls	Ceramic standard	5
Cisterns	Dux	5
Hand Basins	Stainless steel	4
Doors / Partitions	Pressed steel	4
Toilet Roll Holders	Steel	5
Soap Dispensers	None	2
Toilet Door Locks	Steel	5
Lighting		2

Table 53: State Highway 1, Waiouru



## APPENDIX 3 INFORMATION ON DISTRICT LANDFILL

### Ministry for the Environment Comments on the District Landfill – Taumarunui 2000

Risk Issue	Mitigating Factors
<b>Siting</b>	
<ul style="list-style-type: none"> <li>• The site overlies high permeability gravels</li> <li>• There is high velocity groundwater flow underneath the site</li> <li>• Groundwater discharges to Ongarue River</li> <li>• The neighbouring school is a potential receptor for landfill gas.</li> </ul>	
<b>Design</b>	
	<ul style="list-style-type: none"> <li>• There has been historical monitoring of landfill facility,</li> <li>• There is stormwater diversion- improved stormwater flow away from the tip face,</li> <li>• There are stormwater settling ponds prior to discharge to surface water,</li> <li>• The final capping is variable due to the lack of suitable capping material; further capping will be undertaken once appropriate material becomes available.</li> </ul>
<b>Operation</b>	
<ul style="list-style-type: none"> <li>• There is public access to the tipping areas</li> <li>• The current waste acceptance system needs reining – waste acceptance decisions should be based on NZ Waste list and TCLP criteria.</li> </ul>	<ul style="list-style-type: none"> <li>• The current tipping platform limits access to active tip face for members of the public</li> <li>• Daily working cover is applied</li> <li>• There is a simple waste diversion (recycling, reuse) system in place</li> <li>• Loads are inspected as they enter the site</li> </ul>
<b>General Comments</b>	
<p>Given the poor siting and design for this site, the ideal option would be closure and diversion of the current waste stream to an appropriately sited and designed site. In the meantime the focus must be on achieving the best outcomes possible for this site with respect to environmental protection. Examples of areas where there is room for improvement include waste acceptance criteria, public access, and minimisation of leachate generation.</p> <p><u>Waste Acceptance Criteria</u></p> <p>Decisions on acceptance of special or hazardous wastes should be made with reference to a standardised set of waste acceptance criteria. These should be consistent with nation best practise and would be expected to include reference USEPA, TCLP criteria and NZ Waste List.</p> <p><u>Public Access</u></p> <p>Work should continue towards the establishment of a waste transfer station and preventing access to the tip face for member of the public.</p>	

#### Surface Water Handling

Given the unlined nature of the site and the absence of any leachate collection system, minimisation of water percolating through the site is a fundamental tool in minimising leachate generation and subsequent leachate discharge to groundwater and ultimately the Ongarue river.

Work should continue on diverting 'clean' surface water from areas where it is able to percolate through refuse resulting in the generation of leachate. Where possible clean water should be diverted and discharges through the existing ponds system. Improvement in the current cap will also assist in minimising leachate generation but is reliant on the availability of appropriation cover material

#### Upgrades in 2003 to 2004

- 1 A transfer station has been established at the landfill entrance, with recycling facilities and the refuse bins. The general public no longer utilise the tip face.
- 2 Waste acceptance criteria is applied to all known material entering the site.
- 3 An operational plan has been developed to control and separate storm water flow from the working face and general lands around the site.
- 4 Landfill management drawing and filling sequences have been developed for the site.

## APPENDIX 4 MARAE

Marae as recorded in the 2001 census,

### Ohura Ward

- Manu – Ariki
- Whanau – Maria
- Te Koura
- Te Rongaroa
- Te Rukiragi Papakainga
- Te Rakura
- Whareriki
- Tawata

### Taumarunui Ward

- Hia Kartupeka
- Petania
- Paemate
- Wharauoa
- Morero
- Ngapuwaiwaha
- Kauriki
- Maniaiti
- Kakahi
- Te Rena

### National Park

- Otukou
- Papakai
- Makakote
- Kaiwhakauka

### Waimarino

- Mangapapa
- Parinui
- Tieke
- Paraweka
- Upokorui
- Te Puke
- Maungarongo
- Mangamingi
- Rongo – Maraeroa – O – Ngahau – E – Wha
- Tirorangi