WATER SUPPLY

ASSET MANAGEMENT PLAN

2018

DOCUMENT CONTROL SHEET

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SECTION 1- EXECUTIVE SUMMARY

1.1 INTRODUCTION

This Asset Management Plan (AMP) represents Waitomo District Council (WDC) 2018-48 Water Supply Asset Management Plan including the proposed long-term expenditure forecasts for the water supply assets owned and managed by WDC. It is planned to review and update this document regularly, in line with the three yearly planning cycle of the Long Term Plan (LTP), to incorporate improved decision making techniques, better asset information and a better understanding of customer expectations.

The water supply activity budgets contained in WDC's 2018 - 28 LTP and 2018 – 48 Infrastructure Strategy have been informed by this AMP. Council adopted this AMP as a draft early in 2018. The AMP was adjusted following any relevant changes made to the LTP arising from public consultation and after adoption of the final LTP on or before 30 June 2018.

This AMP is intended to demonstrate responsible stewardship of water assets by WDC on behalf of its customers and stakeholders. The AMP also acts as a vehicle for communication with all parties with an interest in WDC's asset management practices. It provides a focus within WDC for ongoing development of sustainable asset management and demonstrates how the service potential of WDC's water supply infrastructure will be maintained at optimum cost to provide a defined level of service over the long term.

The AMP provides the asset management tactics that will enable Council to achieve its strategic goals most cost effectively, via the LTP process. It should be read in conjunction with the Waitomo District Council's Long Term Plan 2018 - 2028. It is based on levels of service tested against resident satisfaction, currently available information and the knowledge, judgment and experience of Council staff and contractors.

There is no plan to expand provision of water supply services to other small townships within Waitomo District, particularly as the low rate of population growth and urban development is not expected to increase demand for further water supply infrastructure, consistent with WDC's 2014 Water and Sanitary Services assessment. The main obstacle is the high unit cost of providing water services that meet the Drinking Water Act 2007 for small communities (less than 500 people).

1.2 SCOPE OF WATER SUPPLY ACTIVITY

This AMP covers the following four water supply schemes owned and operated by WDC:

- Te Kuiti
- Mokau
- Benneydale
- Piopio

Taharoa infrastructure is owned and operated by BHP Steel Mining Ltd. Waitomo Village water and wastewater infrastructure is owned by Tourism Holdings Ltd - neither forms part of this AMP.

The district reticulation consists of 79,068m of pipes of various sizes and materials of which 86% has a remaining life expectancy of more than 20 years and 49% has a life expectancy in excess of 60 years. The bulk of the reticulation is located in Te Kuiti (69%).

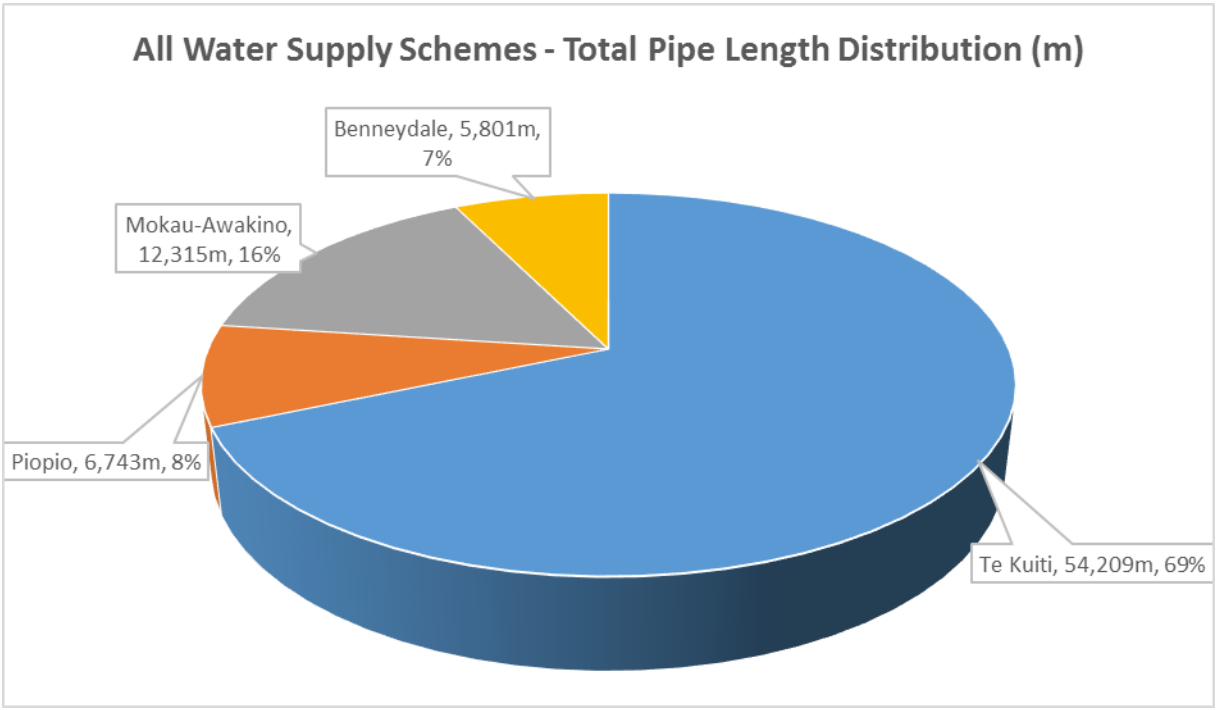


Figure 1.1: Pipe length distribution by Community

The predominant pipe size is 100 mm diameter (44%) followed by 150 mm diameter (23%). Asbestos cement (40%) and PVC (30%) are the most common pipe materials.

The assets comprising the above four schemes currently owned and managed by WDC have an optimised replacement value (ORC) of $24.28 million as at 30 June 2015, as summarised in the following table.

Optimised replacement Cost (ORC)	Optimised Depreciated Replacement Cost (ODRC)	Annual Depreciation
$24,281,649	$14,926,788	$406,123

Figure 1.2: Replacement Value

The water supply (and wastewater) infrastructure at Waitomo Village is privately owned and operated, and does not form part of this AMP. It is noted however that the option of the Village water supply scheme, together with or independent of the other Village infrastructure, being handed over to the Council, has been the subject of discussion between the parties over several years. Complexities relating to long-term tenure of the associated land, asset ownership, and funding have not been able to be resolved. The Waitomo Village system supplies predominantly commercial operations and an itinerant tourist population of up to 650,000 visitors per year.

1.3 STRATEGIC ENVIRONMENT

1.3.1 Vision

Councils Vision for the 2018 – 2028 Long Term Plan is:

"Creating a better future with vibrant communities and thriving business"

Council's Water Supply activity supports this vision by the environmentally safe collection, treatment and reticulation of Council's public water supplies at Te Kuiti, Benneydale, Piopio and Mokau.

1.3.2 Community Outcomes

The Water Supply Activity contributes to the following community outcomes:

Vibrant Communities
A place where we preserve the natural environment for future generations, ensuring that natural resources are used in a sustainable manner

Sustainable Infrastructure
A place that provides safe, reliable and well managed infrastructure which meets the District community needs and supports maintenance of public health, provision of good connectivity and development of the District

Effective Leadership
A place where the governance actively seeks to participate and take a leadership role in regional and national initiatives aimed at the development of the District.

1.3.3 Strategic Goals for the Group

- To deliver safe drinking water in accordance with the Drinking Water Standards for New Zealand 2005 (Revised 2008).
- To deliver reliable water supplies and adequate fire-fighting capabilities to meet the needs of the Community.

1.3.4 Rationale for Service Delivery

This Activity exists to provide a safe and reliable supply of potable water to support the needs of domestic, commercial and industrial users. It also exists to provide water supplies for fire-fighting capacity in urban areas.

Council is involved in this activity to fulfil its legal responsibilities for the supply of water to its communities and to work towards the achievement of community outcomes. Efficient, safe and sustainable water supply services are essential for the social, economic and environmental well-being of the District through the abstraction, treatment, storage and reticulation of water for potable use and firefighting purposes. The Local Government Act 2002 empowers Council to be involved in the ownership and provision of water supply assets and services.

1.4 SUMMARY OF ACTIVITY ISSUES

1.4.1 Resource consents

Each scheme has a specific consented water take, issued and monitored by Waikato Regional Council. Details of each consent is summarised in the table below. Four of consents expire during the next 10 years, Te Kuiti (groundwater take), Benneydale (groundwater take), Piopio (surface take) and Mokau (surface water take)

Township	Consent Number	Consent Type	Consent expiry date	Map References	Population served	Surface water take limit in consent (m^3 per day)	Storage capacity (m^3)	Storage at peak demand (Hours)	Pumping Stations	Reticulation (km)
Te Kuiti	133317	Surface water take	30/09/2040	S16:998-160	4,419	4,800 (Was 6,000m^3/d)	4,390 (across 4 zones)	6	3	49.476
	103577	Land use structure	30/11/2035	S16:001-160						
	113038	Groundwater take	31/08/2020	S16:994-146						
Mokau	113544	Surface water take	15/09/2026	R18:518-799	250 - >1000	1,000	340	24	1	11.002
	113545	Discharge to water	15/09/2026	R18:518-799						
Benneydale	116274	Groundwater take	15/05/2022	S17:166-938	250	180	100	3	0	5.672
	116844	Surface water take	07/04/2031	S:17:170-941						
	116843	Water permit Dam	07/04/2043	S17:170-941						
	116845	Surface water take	07/04/2031	S17:165-957						
	117945	Discharge to water	07/04/2031	S17:170-941						
Piopio	108776	Land Use bed structure	1/08/2023	R17:863-028	468	454.6	454	3	0	6.478
	107477	Surface water take	1/08/2023	R17:863-028						
	107478	Discharge to water	1/08/2023	R17:863-028						

Figure 1.3: Water supply consents and assets used to provide the activity

A brief summary of each water supply scheme follows:

1.4.2 Te Kuiti Water Supply

The supply services a population of approximately 4,400 people plus a number of large industries. The water treatment plant is designed for peak production of 5,800m^3 per day with bulk storage to take care of demand peaks exceeding that or for emergencies is provided in four major reservoirs with a combined capacity of 4,390 m^3 and a smaller 90 m^3 lined timber tank serving a small area along the top of Awakino Road. One of the reservoirs is the filter backwash storage in the present system therefore there is only 3290m^3 effective storage. The operative, 2015 consent has reduced the allowable take from 6,000 m3/d to 4,800 m3/d.

The Te Kuiti Water Treatment Plant (WTP) received a significant upgrade over the past four years, concluding in 2018/19, in accordance with the Drinking Water Act 2007 (Amended 2008) effective from 1 July 2014. In broad terms, the following has been achieved:

- Replacement of filter outlet pipe work and automation of backwash
- New ultraviolet disinfection unit
- Dedicated chlorine contact tank
- Renewal of pipe work in and out of main treated water pump supply (reservoir)
- Rehabilitation and upgrade of the clarifiers
- Replacement of the treatment plant inlet distribution channels including walkways and bridges
- Reconfiguration of intake
- A new building to fit the refurbished WTP requirements
- Electrical, SCADA and telemetry to bring all the above together to provide optimum service

The WTP upgrade cost $6.6 million, with the first phase constructed in 2014-15, involving installation of a UV unit and dedicated backwash tank and replacement of the filter outlet pipe work.

The Drinking Water Act requires storage equivalent to 24 hours of summer average peak demand which for Te Kuiti is 4,230m^3. The additional staorage has been scheduled for 2029/30. The refurbished plant will mitigate the insufficient bulk water storage and the treatment plant should seldom exceed its design capacity during peak demand periods, mitigating the risk of supply failure. A problem of this nature last occurred in December 2007.

The location of the intake for the water treatment plant is deemed a risk due to possible contamination from upstream industries and/or wastewater pumpstation overflow discharge. The cost of relocating the intake above these potential sources of contamination is estimated to be in excess of $2 million and the work is not considered in this AMP. A change to the configuration of the intake is however considered necessary, and coupled with the refurbishment of the plant, will significantly reduce the risk of negative affect on treated water quality.

The major issue for the Te Kuiti water supply involves security of supply. The current, sole source is the Mangaokewa Stream. The combination of peak demand impacts on Stream ecology, climate change effects, and an unstable catchment, leave the supply vulnerable to natural hazards. Mitigation measures programmed include investigations into an alternative source (groundwater) in 2018/19, and the construction of raw water storage in 2040-42. The final measures may entail a combination of both.

The reticulation consists of approximately 50 km of pipes of various sizes and materials. At one point it was assumed that the reticulation was in poor condition and that large quantities of water were being lost as a result. Information gathered more recently, using bulk supply water meters installed at strategic points, indicates that the perceived losses were no more than what can be expected in an unmetered supply system, and the occasional property water meter installed confirmed that it was more likely to be inefficient water use as result of the uniform annual charge water rate payment regime.

The age distribution of the network shows a renewal "bulge" occurring in the 40 to 60 year period. To address this, Council has settled on an average renewal programme of approximately $120,000 per year for the 2018 -2048 period.

1.4.3 Benneydale Water Supply

The Benneydale water supply scheme services a population of about 250. Benneydale has a modern water supply system - the last component upgrade comprising ultra-violet disinfection was completed in 2013. Issues relating to security of supply and risks to health protection were addressed.

Treatment plant capacity is 400 m^3/day and the consented take is 360m^3/day, split equally between groundwater and surface water.

The average daily demand is 68 m^3/day with peak demand 132 m^3/day as a result of a truck wash. Treated storage is 140m^3.

The water used by the truck wash plays a significant part in keeping the cost to residential ratepayers affordable because of the small scale of the supply area.

Reticulation consists of 5,672m of uPVC, PE and MDPE materials with an expected remaining life of 100 years. No renewal expenditure is expected within the next 10-15 years. All connections are metered and fitted with backflow preventers, although charging is not on a metered basis, yet.

The discharge condition of the take consent is not practical and the consent still has 13 years to run. An application to modify it was lodged with Waikato Regional Council during the 2014-15 year.

1.4.4 Piopio Water Supply

The Piopio scheme services a population of about 500 people. The water treatment plant capacity has been upgraded to 600 m^3 per day, although the consent is for 450 m^3 per day. An increased take is necessary as operational requirements make it impractical to operate and maintain the upgraded plant within the old consent limits. The average daily demand is 307 m^3/day with summer average peak of 450 m^3 per day. The upgrade of the WTP was completed during 2012-13 year. The new plant is a microfiltration plant preceded by primary filtration after clarification

Bulk storage to take care of daily demand peaks or for emergencies has a capacity of 450m^3. The existing reservoir is susceptible to earthquake damage and a new reservoir has been scheduled for construction in 2020/21.

The reticulation consists of 6,478m of pipes of various sizes and materials, most of which has a remaining life expectancy of <40 years. Annual renewals of $40,000 per year has been provided. The reservoir is at the end of the reticulation and gets filled by pumping through the reticulation resulting in excessive operating pressure in town. This will shorten pipe life especially that of the mainly AC system. A dedicated rising main construction is programmed for 2019/20.

1.4.5 Mokau Water Supply

Mokau water supply services a population of 250 people increasing to over 1,000 in the summer months. The water treatment plant capacity is up to 400 m^3 per day. The annual average demand is 120 m^3/day with peaks of 350 m^3/day in summer. The consented take is for up to 1,000 m^3/d, with the consent expiring 15 September 2026.

Past issues for the MWS centered on water shortage and quality during summer drought conditions. These have now largely been addressed. The construction of additional raw water storage and treatment plant improvements have improved security of the supply and water quality since 2015. The new raw water supply storage reservoir was completed and integrated with the system in 2015.

The smaller of the two existing raw water storage dams, on the escarpment, is located on private land and also serves to provide stock water. There is a need to secure control over that site in agreement with the landowner. The overflow from this dam feeds the other dam that in turn supplies the newly constructed WDC dam.

Similarly, the three new treated water reservoirs above the treatment plant are located on private land and require easements to secure access requirements.

The reticulation consists of 11,000m of pipes of various sizes and materials. Most of it had a remaining life expectancy of <50 years. The main supply line to town follows the state highway

and was AC. This was replaced in 2006-08 with PE pipe. It represents about 12% of network and has a life expectancy in excess of 100 years.

Some of the other AC pipe was in poorer condition than what the original asset information portrayed, as evidenced by the mains failures that occurred during 2016/17. An accelerated renewal programme has since been implemented, with 90% of the reticulation due to be replaced by the end of 2018/19.

The structural condition of the treatment plant building is such that it will require replacement within the next 10 years.

The previous Water Safety Plan identified the risk of supply contamination due to the absence of back-flow preventers at each point of supply. An on-going programme of fitting preventers is in place.

The travel distances involved to operate maintain the Mokau supply impacts on both operating costs and response times. The opportunity exists to make better use of available technology, namely SCADA, to improve both aspects through remote monitoring and control of the supply, treatment and storage of the scheme. Investigations have been programmed for 2019/20 with implementation the following year.

1.5 LEVELS OF SERVICE

This AMP is focused on clarifying and defining key levels of service for each WDC water supply scheme and then identifying and costing future operations, maintenance, renewal and capital works required to provide those levels of service. The levels of service set out in Section 5 are based on customer expectations, business strategic goals and statutory requirements as set and or interpreted by WDC staff. They will be used as the focus for future customer consultation.

1.5.1 Performance Measures

The Levels of Service and Key Performance Indicators for this Group of Activities are:

Link to community outcomes	What we do (level of service)	How we measure success (performance measure)	2016/17 Target/ Result	2017/18 Target	Year 1 Target 2018/19	Year 2 Target 2019/20	Year 3 Target 2020/21	Year 4-10 Target 2021-28
Vibrant Communities CO5 Sustainable Infrastructure CO10	Water supply system is adequate and sufficiently maintained for public health purposes.	The extent to which WDC's drinking water supplies comply with Part 4 of NZ Drinking-water Standards 2005 (revised 2008) (bacteria compliance criteria)	100% / Not achieved	100%	100%	100%	100%	100%
		The extent to which WDC's drinking water supplies comply with Part 5 of NZ Drinking-water Standards 2005 (revised 2008) (protozoal compliance criteria)	100%* / Not achieved	100%*	100%	100%	100%	100%
Vibrant Communities CO5 Sustainable Infrastructure CO10	Water Supply networks are being maintained adequately.	Percentage of real water loss from the Council's networked reticulation system in a financial year in: *('Water Losses' includes real losses through leaks in the network and apparent losses through metering inaccuracies or water theft. This does not include unauthorised consumption.)*						
		• Te Kuiti	≤ 25% / Achieved (20%)	≤ 25%	≤ 25%	≤ 25%	≤ 25%	≤ 25%
		• Mokau	≤ 25% / Achieved (20%)	≤ 25%	≤ 25%	≤ 25%	≤ 25%	≤ 25%
		• Piopio	≤ 25% / Achieved (25%)	≤ 25%	≤ 25%	≤ 25%	≤ 25%	≤ 25%

Link to community outcomes	What we do (level of service)	How we measure success (performance measure)	2016/17 Target/ Result	2017/18 Target	Year 1 Target 2018/19	Year 2 Target 2019/20	Year 3 Target 2020/21	Year 4-10 Target 2021-28
		• Benneydale	≤ 15% / Achieved (10%)	≤ 15%	≤ 15%	≤ 15%	≤ 15%	≤ 15%
Vibrant Communities CO5 Sustainable Infrastructure CO10	Timely response and resolution of service requests.	The median response times for attendance for urgent call-outs in a financial year**	≤ 180 minutes (3 hrs) / Achieved (<2 hrs)	≤ 180 minutes (3 hrs)	≤ 180 minutes (3 hrs)	≤ 180 minutes (3 hrs)	≤ 180 minutes (3 hrs)	≤ 180 minutes (3 hrs)
		The median resolution time of urgent call-outs in a financial year***	≤ 540 minutes (9hrs) / Achieved (<6 hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)
		The median response times for attendance for non-urgent call outs in a financial year**	≤ 660 Minutes (11hrs) / Achieved (<8 hrs)	≤ 660 Minutes (11hrs)	≤ 660 Minutes (11hrs	≤ 660 Minutes (11hrs	≤ 660 Minutes (11hrs	≤ 660 Minutes (11hrs
		The median resolution time of non-urgent call-outs in a financial year***	≤ 850 minutes (14.1hrs) / Not achieved (<72 hrs)	≤ 850 minutes (14.1hrs)	≤ 96hrs (4 days)	≤ 96hrs (4 days)	≤ 96hrs (4 days)	≤ 96hrs (4 days)
Vibrant Communities CO5 Sustainable Infrastructure	Provision of effective and reliable water supply system to the community.	The total number of complaints received by Council in a year for:						
		• drinking water clarity	≤ 5 per 1000 connections / Achieved (3.2)	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections

Link to community outcomes	What we do (level of service)	How we measure success (performance measure)	2016/17 Target/ Result	2017/18 Target	Year 1 Target 2018/19	Year 2 Target 2019/20	Year 3 Target 2020/21	Year 4-10 Target 2021-28
CO10		• drinking water taste	≤ 5 per 1000 connections / Achieved (0.9)	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections
		• drinking water odour	≤ 5 per 1000 connections / Achieved (0.9)	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections	≤ 5 per 1000 connections
		• drinking water pressure flow	≤ 5 per 1000 connections / Not achieved (47)	≤ 5 per 1000 connections	≤ 30 per 1000 connections	≤ 30 per 1000 connections	≤ 25 per 1000 connections	≤ 25 per 1000 connections
		• continuity of supply	≤ 5 per 1000 connections / Not achieved (37)	≤ 5 per 1000 connections	≤ 30 per 1000 connections	≤ 30 per 1000 connections	≤ 25 per 1000 connections	≤ 25 per 1000 connections
		Median response time to any of these issues within a year.	≤ 180 minutes / Not achieved (<360)	≤ 180 minutes	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)	≤ 540 minutes (9hrs)
Vibrant Communities CO5 Effective Leadership CO8 Sustainable Infrastructure	Efficient management of demand for water for the community.	Average consumption of drinking water per day per resident within the district.	≤ 400 litres per person per day / Achieved (276 litres)	≤ 400 litres per person per day	≤ 400 litres per person per day	≤ 400 litres per person per day	≤ 400 litres per person per day	≤ 400 litres per person per day

Link to community outcomes	What we do (level of service)	How we measure success (performance measure)	2016/17 Target/ Result	2017/18 Target	Year 1 Target 2018/19	Year 2 Target 2019/20	Year 3 Target 2020/21	Year 4-10 Target 2021-28
CO10								
	** Achievement will be based on timing of completion of the Te Kuiti Water Treatment Plant upgrade which is being carried out primarily to ensure compliance with New Zealand Drinking Water Standards requirements.* *** from the time that the Council receives notification to the time that the service personnel reach the site.* **** from the time that the Council receives notification to the time that service personnel confirm resolution of the fault or interruption.*							

Figure 1.4: Performance Measures

Respondents to customer satisfaction surveys in 2010, 2011 and 2014, rated the cost, quality and reliability of WDC's water supply services. The table below shows the top 2 scores (satisfied or very satisfied) over the three survey years.

	2010	2011	2014
Cost of Water	61%	58%	-
Quality	51%	54%	49%
Reliability	-	-	88%

Figure 1.5: Customer Satisfaction Survey Responses

The 2017 Resident Satisfaction Survey identified that, overall, 73% of respondents receiving a supply were satisfied (compared with 80% in 2016). As in previous surveys, taste, colour and odour were the main reasons given for dissatisfaction. The survey did not disclose the distribution of respondents by water supply scheme - each scheme will have its own particular issues.

At a technical level, the key driver of levels of service is the Health (Drinking Water) Amendment Act, which came into force on 1 July 2008. The Act applies to all drinking water supplies serving a permanent population of 25 or more people. The Act provides for phased compliance depending on the size of population served.

All works proposed in this AMP are targeted at managing the risk of supply contamination through meeting the standards of the Drinking Water Act (DWA) and ensuring continuity of supply through routine monitoring and replacement of assets that are at or past their useful lives.

1.6 FUTURE DEMAND

The main drivers of demand for water services are:

- Population growth
- Land use activities (e.g. land development, tourism and coastal settlements)
- Climate change
- Community expectations

1.6.1 Population

Three growth scenarios were developed by *Rationale* in 2017 for three baseline resident population growth rates considered appropriate for Waitomo district - low growth (declining population), medium growth (stable and then decrease in population), high growth (steady population growth). The medium growth scenario is considered the most appropriate for Council's long-term planning.

A summary of the key results is shown below for the recommended medium growth scenario. The change to 2048, average annual change and average annual growth rate is included. These cover the period from 2013 to 2048 for resident population and dwellings. For total rating units, these cover the period from 2018 to 2048.

The projected dwelling and rating unit growth rate is higher than for population due to flow-on effects of changes in population structure. Most of the growth is forecast to occur in the first ten to fifteen years before the rate of growth slows down towards 2048.

Output	2013	2018	2028	2038	2048	Change (to 2048)	Average annual change	Annual average growth rate
Resident Population	9,340	9,810	9,650	9,120	8,420	-920	-26	-0.3%
Total Dwellings	4,224	4,377	4,522	4,644	4,863	639	18	0.4%
Total Rating Units	n/a	5,907	6,022	6,118	6,289	382	13	0.2%

Figure 1.6: Recommended medium growth scenario

1.6.2 Land-use development

From a recent, informal, desktop planning exercise, drawing from development proposals which are known to officers and/or are in the early stages of consent processing, it has been identified that further residential expansion is unlikely to place pressure on the provision of Council services. An indication of that is the modest number of building consents issued for new dwellings in the district over the 3 years since 2014 – a total of 33. While the majority of these (approx. 10) are located in and around Te Kuiti, the distribution is otherwise diffuse. The recent trends of relatively slow development are expected to continue into the foreseeable future with any increase in demand from residential development over the term of this AMP likely to have only minor impact on the existing capacity of most of WDC's wastewater infrastructure.

The one exception to that is the wastewater scheme at Te Waitere, where the existing effluent disposal field is operating at design capacity. Future residential growth at the settlement would accelerate the need for an expanded or alternative disposal facility.

The current agricultural and pastoral based economy is expected to remain predominant in the district, with growth very dependent on economic conditions and export opportunities. Industrial growth, which will in part impact on demand for wastewater treatment and disposal capacity, is largely dependent on attracting new industries. There are currently two major wet industries discharging to the Te Kuiti wastewater system. The effects of discharges from these industries are managed through Council's Trade Waste Bylaw and specific trade waste discharge consents.

1.6.3 Climate Change

Within New Zealand, the Ministry for the Environment has provided local government with advice on Climate Change and more recently coastal hazards and risks arising from increases in sea level. The hazards and risks associated with the District coastlines, estuaries and harbours is expected to compound as will the related exposure of people and infrastructure to hazards and risks. Ongoing consideration will be required as it relates to the assets contained within the Activity Management Plans and the impacts of Climate Change on these assets.
As a District how we prepare, assess, plan, manage and monitor the hazards and risks that arise from climate change will influence the intergenerational resiliency of the Waitomo District.
Currently the council has made provisions within AMP's (Water Supply, Waste Water, Storm Water, Road and Footpaths) and more broadly in particular the consequences of new capital work occurring in areas with the potential to be impacted by climate change. This however will be an ongoing cycle in order to manage the risk associated with Climate Change.

1.6.4 Risks and Resilience Improvement Plan

Aspects that require further development include:

- Further investigation to improve information and AM planning regarding the potential impact of natural hazards
- Further assessment of risk and programmes to mitigate risk in the light of the above investigations
- Development a more advanced approach to identifying critical assets that incorporates rating and other dimensions of criticality.
- Further assessment of current levels of resilience
- Develop a more comprehensive method of assessing resilience using risk based evaluation and optimised decision making tools to assist decision making around the desired level of resilience
- On-going review of the risk register.

1.6.5 Community Expectations

The following trends are expected to impact on the quantity and quality of wastewater services provided:

- Continued public pressure for land based effluent disposal
- Increasingly more stringent resource consent conditions for wastewater disposal

It is noted that the water (and wastewater) assets at Waitomo Village are privately owned and operated, and do not form part of this AMP. The option of the Village water supply infrastructure being vested in the Council has been the subject of protracted discussion between the parties over the past several years, but complexities relating to long-term tenure of the associated land, ownership of the assets and funding have failed to be resolved. The Village system supplies predominantly commercial operations and an intermittent but significant tourist population of up to 650,000 visitors per year.

1.6.6 Demand implications

The implications of these demand trends on the quantity and quality of water supply services over the next 30 years will be:

- Future maintenance and renewals costs associated with the water supply infrastructure can be expected to increase within the planning period.
- Relatively minor changes to technical LoS could have major impacts on costs.
- Consent requirements for take consents will increase service costs.
- Modest provision has been made over the term of this AMP for additional water supply infrastructure at the Te Kuiti WWTP to support security of supply due to the impacts of climate change.
- Potential demand for WDC ownership/management of the Waitomo Village water supply (and wastewater) infrastructure (but not forming part of this AMP).

1.7 LIFE CYCLE ASSET MANAGEMENT

Asset management practices focus on lifecycle activities (creation, maintenance, renewal, improvement, and disposal) for each asset group to improve the decision making and evaluation of options associated with each asset and to optimise lifecycle costs.

Although WDC's water supply assets are generally in a satisfactory condition, with recent improvements to the water treatment facilities at each scheme, some assets are showing signs of deterioration or are not performing at full design capacity. In particular, the following specific issues are noted:

- **Te Kuiti:** the reticulation network contains a number of dead end mains which should be ring fed to improve quality and reduce waste resulting from regular flushing. A project is required to fully analyse the model developed, identify all the required improvements and develop an implementation programme. In the mean-time dead end mains are addressed during renewals as is possible.
- The Te Kuiti intake and head works are located downstream from a sewer pump station as well as the industrial area. There is the potential for an overflow of the pump station and or an industrial spill that could contaminate the raw water supply. Options for relocation of the intake are to be reviewed There is a possible upstream intake offering the advantage of a gravity supply with increased capital cost but significant reduction in energy costs. This is perceived to be not economically feasible.
- The Mangaokewa is the only raw water supply for Te Kuiti and in a severe drought could lead to major water restrictions or, in a worst case scenario, failure of supply. It is considered prudent to investigate an off-stream raw storage to bridge such an event. Funding has been allocated in 2018/19 to commence preliminary investigations into alternative supply options, followed by construction of a large storage dam in 2040 - 42.
- The Te Kuiti treatment plant has been upgraded in light of the Health (Drinking Water) Amendment Act 2007 (Amended 2008) which came into force on 1 July 2008. The required upgrade will be done in 4 phases, with target completion date for all four phases June 2019
- Treated water storage for the Te Kuiti scheme does not meet the industry standard of 24 hours. Additional treated water storage has been provided in 2029/30.
- The upgrade of the water main along Rora Street in the CBD has been postponed and will be addressed during the next main street road rehabilitation project after 2028.

- **Benneydale**: The reticulation was replaced in 2008. An auxiliary bore supply is available for use during spikes in turbidity in the raw surface water supply following heavy rainfall events. Treatment plant improvements were completed in light of the new Drinking Water Act 2007 (Amended 2008). Further work necessitated by the Act, protozoal treatment, has been completed.

- **Piopio:** The WTP was upgraded during 2012 - 2013. The reticulation shows a very peaky age with replacement of the majority of the reticulation around 2029. Pipe failures experienced in recent years indicate that the renewal needs to accelerated and the –2018-2028 LTP makes provision for replacement over the life of the LTP influenced by active condition assessment of existing reticulation. The majority of the old 50 mm AC pipe has been replaced in 2013 due to failure.

- **Mokau:** The security of the raw water supply for Mokau has been resolved with the construction of a 12,000m^3 storage dam in addition to the existing dams. The existing earth dams were strengthened in 2016 to meet the legislative requirements under the Building Act.
- The reticulation consists of 11,002m of pipes of various sizes and materials all pipe work has a remaining life expectancy of <50 years and 12% of reticulation has a life expectancy in excess of 100 years. The main supply line to town follows the state highway has been replaced (2006-8) with a PE pipeline.
- As a coastal town there is demand for development and with it the opportunity to reduce the unit cost of water, particularly now that security of the supply has been resolved.

- **Other**: Waitomo Village and Taharoa supplies are privately owned and operated. There has been discussion in the past that the Waitomo Village water supply infrastructure should be passed over to WDC in the interests of public health and safety, but progress

with those matters has stalled. The very small user base makes the cost per unit of water produced, high.

- Awakino, Marokopa, Te Waitere and Aria do not have public water supply schemes, apart from a limited supply from the Mokau scheme to the hotel at Awakino. No provision has been made for investigation of new supply schemes during the planning period.

1.8 RISK MANAGEMENT PRACTICES

A pragmatic approach has been taken to risk management, with identified risk events grouped into:

- Natural events, where there is no real control over the timing or extent of the event, although probabilities may be understood, e.g. floods, lightning strikes, earthquakes.
- External impacts, where other service providers impact on continuity of the water supply activity, e.g. power supply failures, material supply failures.
- Physical failure risks, where condition, performance of the asset or third part damage could lead to failure.
- Operational risks, where maintenance and or management of the asset or asset management activities may impact adversely on the asset.

Part of WDC's asset management practices includes risk management decision making tools used to prioritise long term renewal, upgrade and development expenditure for water supply infrastructure.

The risks currently impacting on WDC's water supply services, to be investigated and/or addressed during the term of this plan, are summarised below:

Supply	Risk
Te Kuiti	• Demand exceeding consented raw water take during summer conditions with no raw storage facilities or planning • Potential contamination from sewer pump station and spills from industrial activities upstream of intake • Unsecured source hence protection against potential protozoa (e.g. giardia, cryptosporidium) contamination i.e. Treatment plant non-compliant with Drinking Water Act 2007 (Amended 2008) • Standard, Regulatory and Legislative Compliance • Force Majeure – Storms, Earthquakes & Floods • Capacity – Under supply • Condition of trunk mains supplying reservoirs • Back flow prevention
Benneydale	• Affordability
Piopio	• Unsecured source hence protection against potential protozoan contamination • Backflow prevention
Mokau	• Unsecured source hence potential for protozoan contamination • Treated water storage marginally meeting Drinking Water Act 2007 requirements • Affordability a significant issue • Backflow prevention

Figure 1.7: Water Supply Services

Critical assets are defined as those where the impact of failure would have the highest consequences on the services that must continue to operate to an acceptable level to avoid damage to community well-being. Critical assets for the water supply activity include the high criticality assets in the table below:

Criticality	Asset Description
1 (High)	• Supply intake/groundwater well • Open storage dams • Disinfection units • Storage reservoirs • Trunk mains • All assets with a Risk Assessment of high or above
2	• Control systems

Criticality	Asset Description
	• Filtration units • Coagulation/sedimentation tanks • Pipelines 200mm diameter or greater (other than trunk mains) • All other assets with a Risk Assessment of moderate
3 (Low)	• All other pipelines • Telemetry units • All assets with a Risk Assessment of low

Figure 1.8: Critical Assets

Asset management practices are also supported by:

- Processes: The necessary processes, analysis and evaluation techniques needed for life cycle asset management. It includes risk management.
- Information systems: The information support systems used to store and manipulate the data.
- Data: Data available for manipulation and interpretation by information systems to produce the required outputs.

1.9 FINANCIAL SUMMARY

The following table summarises financial forecast for the water supply activity:

Key Strategies Impacting on Future Levels of Service

Other investigatory/strategy type programmes have been identified that, while not impacting on levels of service initially, the outcomes may. These are listed below.

Water
Figure S.3: Key Programmes to Maintain and Achieve Levels of Service

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level in Projections	Estimated Timeline for Project Completion
Demand	Investigate Raw Storage Dam	Health & Safety Legislative	$50,000 18/19 $51,250 19/20 $52,400 20/21 $107,300 21/22	C	2018-2022
Consistency and Quality	Bulk Reticulation Monitoring	Health & Safety Legislative	$10,000 18/19 $10,250 19/20 $10,480 20/21 $10,730 21/22 $10,990 22/23 $11,270 23/24 $11,550 24/25 $11,860 25/26 $12,190 26/27 $12,530 27/28	C	2018-2028

Water

Figure S.4: Other Key Programmes That May Affect Levels of Service

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level in Projections	Estimated Timeline for Project Completion
Quality of Supply	Backflow Preventers (Te Kuiti)	Health & Safety Legislative	$42,000 18/19 $43,050 19/20 $44,016 20/21 $45,066 21/22 $46,158 22/23 $47,334 23/24 $48,510 24/25	C	2018-2025
Quality of Supply	Backflow Preventers (Mokau)	Health & Safety Legislative	$2,420 18/19 $2,481 19/20 $2,536 20/21 $2,597 21/22 $2,660 22/23 $2,727 23/24 $2,795 24/25 $2,870 25/26 $2,950 26/27 $3,032 27/28	C	2018-2028
Supply and Continuity	Access Easement	Health & Safety Legislative	$27,475 22/23	C	2022-2023
Quality of Supply	Backflow Preventers (Piopio)	Health & Safety Legislative	$5,500 18/19 $5,638 19/20 $5,764 20/21 $5,902 21/22 $6,045 22/23 $6,199 23/24 $6,353 24/25 $6,523 25/26 $6,705 26/27 $6,892 27/28	C	2018-2028

Future Demand

The key issues impacting on demand forecasts for Housing and Other Property are:

a) An aging population

b) The need to develop assets relevant to community needs

c) User pays as a means of funding and addressing equity issues

d) An increase in public awareness and expectations of higher standards

Figure S.5: Capital Programmes to Meet Growth and Demand

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Quality	Te Kuiti SCADA	Legislative Health & Safety	$50,000 18/19	C	2018-2019
Continuity	Mokau Water-main Renewals	Legislative Health & Safety	$96,000 18/19	C	2018-2019

Demand	New Pumping Line to Reservoir (Piopio)	Legislative Health & Safety	$138,375 19/20	C	2019-2020
Demand	Additional new Reservoir	Legislative Health & Safety	$250,000 18/19	C	2018-2019
Quality and Consistency	Additional Monitoring and Control - Bennnydale	Legislative Health & Safety	$26,825 21/22	C	2021-2022
Quality and Consistency	Treatment Plant Monitoring	Legislative Health & Safety	$61,500 19/20	C	2019-2020

Figure S.10: Renewal Programmes

Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Mechanical Renewals Te Kuiti	Health & Safety Environment Legislation	$30,000 18/19 $30,750 19/20	C	2018-2020
Unplanned Pump Renewals	Health & Safety Environment Legislation	$10,000 18/19 $10,250 19/20 $10,480 20/21 $10,730 21/22 $10,990 22/23 $11,270 23/24 $11,550 24/25 $11,860 25/26 $12,190 26/27 $12,530 27/28	C	2018-2028
Reticulation Renewals Minor Mokau	Health & Safety Environment Legislation	$5,125 19/20 $5,240 20/21 $5,365 21/22	C	2019-2022
Reticulation Renewals Minor Te Kuiti	Health & Safety Environment Legislation	$60,000 18/19 $61,500 19/20 $62,880 20/21 $64,380 21/22 $65,940 22/23 $67,620 23/24 $69,300 24/25 $71,160 25/26 $73,140 26/27 $73,140 27/28 $75,180 28/29	C	2018-2029
Treatment Plant Renewals Mokau	Health & Safety Environment Legislation	$13,500 18/19 $4,100 19/20 $4,946 22/23 $5,486 26/27 $62,650 27/28	C	2018-2028
Unplanned Pump Renewals	Health & Safety Environment Legislation	$3,000 18/19 $3,075 19/20 $3,144 20/21 $3,219 21/22 $3,297 22/23 $3,381 23/24 $3,465 24/25 $3,558 25/26 $3,657 26/27 3$,759 27/28	C	2018-2028
Mechanical Renewals (piopio)	Health & Safety Environment Legislation	$48,000 18/19 $35,875 19/20 $26,200 20/21 $52,752 21/22 $58,512 22/23	C	2018-2023

Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Reticulation Renewals (Piopio)		$20,000 18/19 $20,500 19/20 $20,960 20/21 $21,460 21/22 $21,980 22/23 $22,540 23/24 $23,100 24/25 $23,720 25/26 $24,380 26/27 $25,060 27/28	C	2018-2028
Reticulation Renewals (Piopio) Minor	Health & Safety Environment Legislation	$15,060 18/19 $15,437 19/20 $15,738 20/21 $16,159 21/22 $16,551 22/23 $16,973 23/24 $17,394 24/25 $17,861 25/26 $18,358 26/27 $18,870 27/28	C	2018-2028
Reservoir Seismic Strengthening	Health & Safety Environment Legislation	$22,000 18/19 $22,550 19/20 $23,056 20/21 $23,606 21/22 $24,178 22/23	C	2018-2023
Te Kuiti Renewals		$105,000 18/19 $123,000 19/20 $125,760 20/21 $128,760 21/22 $131,880 22/23 $135,240 23/24 $138,600 24/25 $142,320 25/26 $146,280 26/27 $150,360 27/28	C	2018-2028
Minor Works Renewals	Health & Safety Environment Legislation	$3,500 18/19 $3,588 19/20 $3,668 20/21 $3,756 21/22 $3,847 22/23 $3,945 23/24 $4,043 24/25 $4,151 25/26 $4,267 26/27 $4,386 27/28	C	2018-2028

Capital works projects being planned to meet growth in demand include:

Trend	Project	Key Service Criteria	Forecasted Total Cost	Confidence Level In Projections	Estimated Timeline for Project Completion
Quality and Consistency	Te Kuiti SCADA	Legislative Health & Safety	$50,000 18/19	C	2018-2019
Demand	Mokau Water-main Renewals	Legislative Health & Safety	$96,000 18/19	C	2018-2019

Demand	New Pumping Line to Reservoir (Piopio)	Legislative Health & Safety	$138,375 19/20	C	2019-2020
Demand	Additional new Reservoir	Legislative Health & Safety	$250,000 18/19	C	2018-2019
Quality and Consistency	Additional Monitoring and Control - Bennnydale	Legislative Health & Safety	$26,825 21/22	C	2021-2022
Quality and Consistency	Treatment Plant Monitoring	Legislative Health & Safety	$61,500 19/20	C	2019-2020

The overall water activity forecast for the next 10 years proposes:

- Total projected operating and maintenance cost (excluding inflation) of $15.9M over the 2018 – 2028 period.
- Reticulation renewals in Te Kuiti of $1.2M is envisaged over the next 10 years.
- No provision has been made for new water supply schemes in support of managed growth planning concepts
- These projections and the AMP will be reviewed in 2020/21 ahead of the 2021-31 LTP in light of updated asset information that will be collected and recorded over the next 2.5 years.

The strategy for the financial forecast is to:

- assign realistic timing to projects given the resources available with WDC's current funding sources and in relation to impacts on other Activity Management Plans
- optimise timing of projects
- generate consistent budgeting philosophies across all asset groups
- align expenditure with growth predictions
- continue to do works identified as asset information improves.

1.10 ASSUMPTIONS

The following basic assumptions have been made in preparing the 10 year cash flow forecasts.

- All expenditure is stated in dollar values as at 30 June 2017 with no allowance made for inflation over the 10 year planning period
- No significant increase in overhead costs will occur during the 2018-2028 planning period.
- At this stage it is anticipated that there may be a gradual increase in operations and maintenance expenditure in real terms over the planned period due to the continued ageing of the reticulation asset and more stringent statutory monitoring and reporting requirements. In addition, the increased level of sophistication of the upgraded water treatment plants requires higher levels of staff input.
- Improved asset renewal decision making is expected to reduce maintenance needs made possible by enhanced information used in the asset management system which should help to slow the rise in operating costs. As this reduction is difficult to quantify, it has been assumed that the net effect will be neutral and not been provided for in the financial forecasts.
- There will be no additional assets vested in Council from subdivisional development over the term of the AMP. This assumption will be reviewed in the next 3 year planning cycle
- Maintenance allocations are largely based on maintaining current levels of expenditure.
- Significant increases in the required funding may however result from more detailed evaluation of asset renewal requirements at the treatment plants and more stringent consent and legislative requirements. Although such costs may be offset slightly by resultant reductions in maintenance costs for the assets involved, increased depreciation has been assumed to exceed any such saving.

- The most significant changes may result from further changes to legislation and or Waikato Regional Council (WRC) review of its Regional Plan as it affects water assets and the need to meet higher environmental standards and more stringent water management requirements in control and reporting.
- It has been assumed that there will be no change to the current ownership/management regime for the Waitomo Village water supply scheme. Therefore, no allowance has been made for any costs associated with the Waitomo Village water supply scheme in this AMP.

The current funding options available for the water supply activity include:

- Rates
- Development contributions (no current policy)
- Financial Contributions
- Capital works subsidies from Ministry of Health
- Capital contributions (e.g. from past subdivisions pre LGA 2002)
- Special funds – reserves, investment funds, etc
- Water by meter charges

1.11 AMP IMPROVEMENT PROGRAMME

An improvement plan that outlines steps required to improve the quality of both the content and presentation of this AM plan is included as Section 8 (Improvement Plan section). This has been compiled in conjunction with the plan update.

Key activities/programmes identified in the improvement plan are:

- Consult to ascertain the community's service needs and priorities and to ensure their views are considered when selecting the best level of service scenario.
- Continue flow monitoring at Te Kuiti to quantify actual water consumption and losses.
- Continue incremental renewal of all water reticulation and improve supply reliability, including automation of processes, monitoring of performance and collection of data.
- Improve asset data collection procedures and improve maintenance reporting
- Continue development of accurate and complete asset registers for each scheme.
- Develop a greater focus on risk identification and management, obtaining more detailed information on critical assets.
- Prioritise the works developed from a risk assessment exercises.
- Review and improve on the individual asset strategies outlined in Section 5 and produce an updated financial forecast in line with the next LTP planning cycle.
- Confirm the right level of funding is being allocated to maintain the asset service potential.
- Develop strategies to meet more stringent water quality standards and consent requirements
- Review pump station and treatment plant maintenance programmes.
- Investigate universal metering across all water supply schemes
- Implement predictive modeling techniques that will allow consideration of alternative long term renewal scenarios.

SECTION 2 - INTRODUCTION

2.1 WAITOMO DISTRICT

Waitomo District occupies a large area extending from the west coast of the North Island between Mokau and Te Waitere through to Pureora forest in the east, and from Mapiu in the south to Waitomo Village in the north. The District is situated within the Waikato Region and comprises 3363.57 sq km of land. The total, usually resident, population is 8,910 (2013 Census), with Te Kuiti the main residential and service center having a population of 4,218. Other towns include Mokau, Waitomo, Piopio, Te Waitere, Awakino, Marokopa and Benneydale. The local economy is based on farming, forestry, mining and tourism, some of which are key users of the district's water supply infrastructure.

2.2 PURPOSE OF AM PLANNING

Council is responsible for the management of four urban water schemes which have a combined optimised replacement cost (ORC) value of approximately $24.3M (30 June 2015).

The size of this investment and the importance of water services to the community demands excellence in the management of these assets. The community expects water assets to be managed in such a way that costs are minimised while providing the levels of service that the community desires.

This activity management plan (AMP) is the tool for combining management, financial, engineering and technical practices to ensure that the level of service required by customers is provided at the lowest long term cost to the community. The AMP is intended to demonstrate to the District's ratepayers that Council is managing their assets responsibly and to optimised price / quality trade-offs resulting from alternative levels of service.

2.3 BENEFITS OF ACTIVITY MANAGEMENT PLANNING

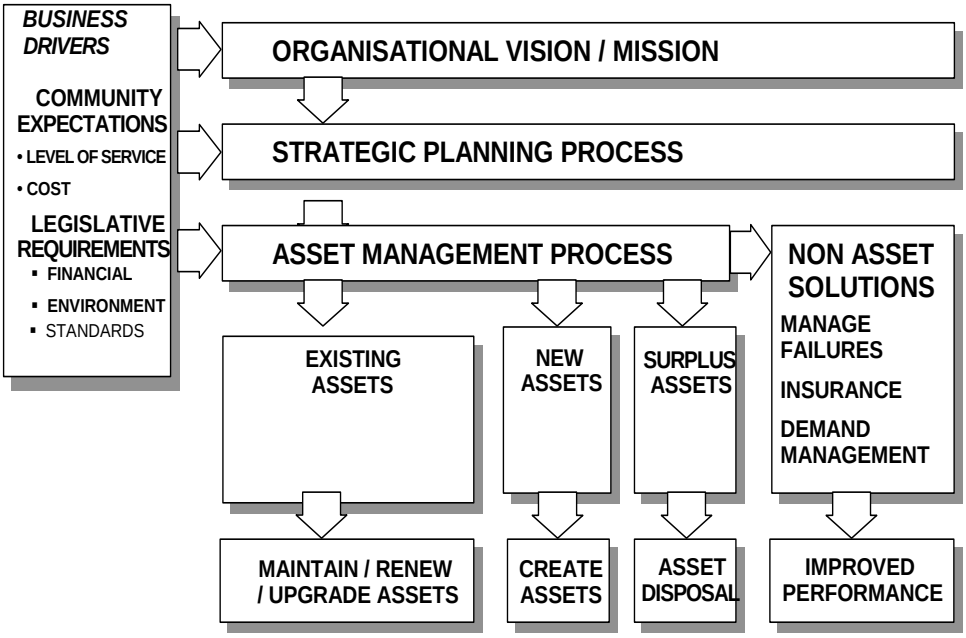
The main benefits derived from AM planning are:

- Improved understanding of service level options and standards
- Minimum lifecycle (long term) costs are identified for an agreed level of service
- Better understanding and forecasting of asset related management options and costs
- Managed risk of asset failure
- Improved decision making based on costs and benefits of alternatives
- Clear justification of forward works programmes and funding requirements
- Improved accountability over the use of public resources
- Improved customer satisfaction and organisational image

A fundamental objective throughout the preparation (and future review) of this AMP will be to identify potential opportunities for reductions in asset lifecycle costs.

2.4 PROCESS FOR DEVELOPING ACTIVITY MANAGEMENT PLAN

AMP's are a key contributor to Council's planning, being prepared within the context of Council's strategic and financial planning processes. These links, and the key outputs of the asset management planning process, are illustrated in the figure below:



(Source: NAMS Manual)
Figure 2.1: Activity Management Planning Process

This plan is the latest version of the WDC's water supply asset management plan, developed through a "living" process of three-yearly updating and improvement. The first version was prepared in 2001 then revised in 2003, 2004, 2006, 2009, 2012 and 2015, linking asset management planning to the processes and principles outlined in the Local Government Act 2002 for long term planning.

The timing of this version is consistent with the three yearly review of the Council's 2018-28 Long Term Plan (LTP). It is one of several AMP's prepared within the current planning cycle as part of a much larger, organisation wide project.

The establishment of the organisation wide project plan, known as the "Road Map", is led by the Group Manager - Corporate Services and sponsored by the Chief Executive. The Road Map is a detailed organisational work programme for the adoption and implementation of the Long Term Plan. It ensures that key organisational planning issues are addressed systematically.

A specific AM planning strategy/work plan for the AMP section of the Road Map was developed to facilitate cross organisation coordination and to improve alignment of expectations between Council and management. Input to the project included the General Manager – Infrastructure Services, asset management staff, and corporate services staff. The project was coordinated and quality managed internally and some documents peer reviewed externally.

The AMP will be subject to ongoing review, particularly in relation to changing service delivery standards and expectations, and changes in the demand for and use of services. By monitoring community service delivery requirements, Council will be better able to develop and manage its assets and ensure community demand and service levels are met in the most effective and timely manner. A programme of AM improvement (see Section **Error! Reference source not found.**) will also be undertaken to improve the quality of decision making, the knowledge of assets and customer expectations and the accuracy of the financial projections.

2.5 PLAN FRAMEWORK

The sections are structured to develop the AM plan in a logical manner as follows:

Section Number	Section Title	Description
1	Summary	A succinct overview of the key issues contained in the body of the AMP
2	Introduction	A summary of all the elements of the water activity, the rationale for ownership of the asset components, and the reasons for preparing the AMP
3	The Activity	A description of the assets making up the water supply activity and the potential significant negative effects.
4	Strategic Environment	A discussion on the planning and statutory framework and the context of where the AMP is situated within it.
5	Levels of Service	An outline of the levels of service that are proposed and the basis for these.
6	Future Demand	Details of growth forecasts impacting on the management and utilisation of the assets and which form the basis for proposed new works.
7	Risk Management	Identifies the risks associated with the activity and the resilience of critical assets to natural disasters
8	Lifecycle Asset Management	Details of what is planned to manage and operate the water supply activity at the agreed levels of service and optimal lifecycle cost.
9	Asset Management Practices	The information available, the information systems and processes used to make decisions on how the assets will be managed
10	Financial Summary	The financial requirements resulting from all the information in the previous sections
11	Assumptions	The assumptions used and uncertainty in forecasting the expenditure required to achieve the agreed levels of service over the term of the plan
12	Improvement Plan	Details of the plan for monitoring implementation and effectiveness of the AMP and improvements to AM systems to improve confidence in the AMP, particularly over the next three years.
13	References	Details of information sources used to prepare this AMP
14	Appendices	Complementary material referred to in the body of the document

Figure 2.2: Plan Framework

2.6 SIGNIFICANT CHANGES TO THIS AMP

In addition to informing the 2018 -28 LTP, this AMP provides the asset management basis for WDC's Infrastructure Strategy in accordance with s.101B of the Local Government Act 2002. The financial projections in Section 10 of the AMP have therefore been increased to a 30-year term in keeping with the statutory term of the Infrastructure Strategy.

SECTION 3 - THE ACTIVITY

3.1 DESCRIPTION OF WATER SUPPLY ACTIVITY

This AMP covers WDC's planning for the management of its water supply infrastructure over the 30-year period from 1 July 2018 to 30 June 2048. The assets include the reticulation network, pumping stations, treatment plants and backwash disposal systems for each of the following four schemes with a combined population of approximately 5,200 people out of a total district population of 8,910 (2013 census):

a. Te Kuiti
b. Mokau
c. Benneydale
d. Piopio

3.2 SCOPE OF ASSETS

The total scope of assets which make up these four schemes is:

Asset Type	Quantity
Water treatment plants (including pump stations)	4 (no.)
Water reticulation	79,069 km
Fire hydrants	434 (no.)
Storage volume	4,773.6 m^3
Booster pump stations	4
Raw water storage (Mokau)	3 dams 20,000m3

Figure 3.1: Scope of Assets

Taharoa water supply infrastructure is owned and operated by BHP Steel Mining Ltd. Waitomo Village infrastructure is owned by Tourism Holdings Ltd - neither forms part of this AMP.

The district reticulation consists of pipes of various sizes and materials of which 86% has a remaining life expectancy of more than 20 years and 49% has a life expectancy in excess of 60 years. The bulk of the reticulation is in Te Kuiti (68%)

The assets comprising the above four schemes have an optimised replacement cost (ORC) of $24.28 million.

3.3 MANAGEMENT STRUCTURE

The WDC Infrastructure Services Group manages the water supply activity. The organisational structure is shown in Appendix M.

3.4 PHYSICAL WORKS & PROFESSIONAL SERVICES DELIVERY

WDC contracts out all non-routine maintenance, renewal and new water supply projects. The management of these contracts is undertaken by WDC's in-house resources. Future service delivery arrangements were recently reviewed (June 2017) in accordance with S.17A of the Local Government Act 2002. It was resolved to retain the current service delivery arrangements, comprising an internal service agreement for the provision of water and wastewater treatment activities, plus a contractual arrangement for the delivery of reticulation maintenance services at agreed hire rates.

3.5 SIGNIFICANT NEGATIVE EFFECTS OF PROVIDING WATER SUPPLY ACTIVITY

An inadequate or inefficient community water supply system can lead to social, economic and environmental consequences. Even on a moderate scale, these impacts have the potential to adversely affect environmental, social and economic well-being.

Lack of or inadequate water supply can create unsanitary conditions leading to development of health hazards and impair economic activity, poor quality water can lead to water borne sickness. These are a few of the potential negative effects from poor provision of water services.

WELLBEING	POSITIVE EFFECTS	NEGATIVE EFFECTS
Social	Maintaining/improving community health and wellbeing by providing safe drinking water and fire-fighting protection to urban communities	Cost of compliance with NZ Drinking Water Standards for NZ. Potential for wasteful use of raw water resource necessitating additional capital investment for storage capacity.
Environmental	Good water supply planning, design and demand management mitigates the adverse effects of the take and treatment plant on the environment.	Cost of consent monitoring and compliance. Potential for negative impacts on raw water source downstream from intakes.
Economic	Effective water supply services facilitate the use of land for commercial and industrial development.	High industrial use of WDC water supplies could compromise the supply capacity for residential users.
Cultural	Facilitates hosting of traditional community gatherings and events.	Life supporting capacity of water sources could be compromised by excessive takes.

Figure 3.2: Effects of Water Supply

SECTION 4 - STRATEGIC ENVIRONMENT

4.1 VISION

Councils Vision for the 2018-2028 Long Term Plan is:

"Creating a better future with vibrant communities and thriving business"

Council's water supply activity supports this vision by:

- maintaining the existing system
- eliminating public health issues associated with water borne diseases, where practicable
- facilitating the development of new industries and employment in the district through the provision of essential water supply infrastructure

4.2 COMMUNITY OUTCOMES

The Water Supply Activity contributes to the following community outcomes:

CO5 - *Preserving the Environment*
A place where we preserve the natural environment for future generations, ensuring that natural resources are used in a sustainable manner

CO10 **-** *Sustainable Infrastructure*
A place that provides safe, reliable and well managed infrastructure which meets the District community needs and supports maintenance of public health, provision of good connectivity and development of the District

4.3 STRATEGIC GOALS FOR THE GROUP

- To protect public health
- To protect the environment from the adverse effects of extracting water
- To enable economic development

4.4 RATIONALE FOR COUNCIL INVOLVEMENT

This Group activity exists to facilitate the maintenance of public health and development of the District.

The rationale for Council's involvement, stems in part from statutory requirements. The legal authority for Council to be involved in the provision of water supply services is contained in the Local Government Act 2002 (LGA), specifically Sections 10-11A inclusive regarding the purpose, role and core services of local government, and the Section 101B requirement to prepare an Infrastructure Strategy for its infrastructure assets, including water supply.

The LGA requires local authorities to act in accordance with the principles set out in Section 14, namely prudent stewardship and the efficient and effective use of its resources, including effective planning for the future use of its assets, and to take a sustainable development approach that takes into account the social, economic, and cultural wellbeing of people and communities, the need to maintain and enhance the quality of the environment, in the present and for the future.

Further, s.125 of the LGA requires WDC to undertake, from time to time, an assessment of water and sanitary services available to communities in the district. The purpose of an assessment is to assess, from a public health perspective, the adequacy of those water and other sanitary services, including health risks, quality, current and future demands for such services, compliance with drinking water standards, and the actual or potential consequences of stormwater and sewage discharges within the district. The most recent assessment was completed in 2014.

WDC's water supply network in its entirety is defined as a strategic asset in its Significance and Engagement Policy. In accordance with the provisions of the Local Government Act 2002, WDC cannot transfer ownership or control of a strategic asset, or construct, replace or abandon a strategic asset unless it has first consulted with the community and included the proposal in its Long Term Plan.

The Local Government Act 2002 also empowers Council to acquire land for public works:

⇨ Section 181 empowers Council to construct work on private land that it considers necessary for (inter alia) water supply

⇨ Section 189 (1), "Power to Acquire Land": empowers Council to 'purchase, or take in the manner provided for in the Public Works Act 1981, any land or interest in land, whether within or outside its district, that may be necessary or convenient for the purposes of, or in connection with, any public work that the local authority was empowered to undertake, construct or provide immediately before 1 July 2003'.

Council intends to continue with its present involvement with the water supply activity, and this AMP has been developed on that basis. WDC's water supply activity is a core service, with the associated infrastructure as a whole included in the definition of strategic assets in Council's Policy on Significance and Engagement as an essential activity associated with protecting public health.

4.5 JUSTIFICATION FOR OWNERSHIP

Schedule 10 of the Local Government Act 2002, places requirements on councils to justify their role and the method of funding each of its groups of activities, including the water supply activity. Political decisions on these strategic issues involve the scope, standard, cost, delivery and funding of services.

WDC's ownership of urban water supply infrastructure assets is justified by the following factors relating to the service;

- Core Business - Council accepts responsibility for providing essential services. These services include water supply.
- Natural monopoly - Council is empowered by the LG Act 2002 to provide domestic water supply services, with the decisions as to the standard of service and allocation of resources being legislative and political rather than market driven.
- Funding - Council has access to more favourable financing options for the level of expenditure required over the long term (next 30 years).
- Community Opinion - the public and Council have expressed preference for key infrastructural assets to remain in public ownership
- Exclusivity - it is impractical to exclude customers from utilising the service by stopping supply
- Public Benefit - the service is generally assessed as providing mainly public benefits associated with economic growth, public health and environmental protection.
- Legislation - the LG Act 2002 makes it mandatory for Council to continue to maintain its public water supplies except in very special circumstances and subject to formal consultation and agreement processes

Through the provisions of the Health Act 1956, Council is directed to control, monitor and report results of water quality and services to the national water information database (WINZ) Council also works with the District Health Board to undertake projects and maintenance that form part of a national water capital assistance programme. Council has received financial assistance from Ministry of Health under the CAPS scheme towards new construction costs where the work was related to public health protection in the past and will apply for further funding where applicable.

4.6 THE EXTENT OF COUNCIL'S RESPONSIBILITY

Council is the primary service provider for the construction, maintenance and repair of the public water systems within Waitomo District Council and may maintain the District's water systems as it sees fit, subject to government and regional council requirements.

The activity comprises a number of elements including intakes, distribution pipes, pumping stations and treatment plants. Council oversees this responsibility by coordinating and contracting physical works to outside organisations and delivering some operation and maintenance work in-house.

4.7 OTHER RELEVANT LEGISLATIVE REQUIREMENTS

Council is a "Network Utility Operator", a "Requiring Authority" and a consent holder, as defined in the Resource Management Act 1991. It is legally responsible for the control of its water systems.

The Council also has a separate role as a Consent Authority for the purposes of the Resource Management Act. This will occasionally mean that the Council must apply to itself for a designation or land use consent in respect of its water operations.

4.8 COUNCIL BYLAWS

WDC operates the Water Services Bylaw (WSB) which was last reviewed in 2014 and adopted on 10 February 2015 following public consultation. The bylaw provides regulations to support the effective management, use and protection of WDC's water supply, stormwater and wastewater activities. The stated scope of the WSB is to:

- Protect public health and the security of the public water supply
- Detail the responsibilities of both the Council and the consumers with respect to the public water supply and other water related services
- Ensure the safe and efficient creation, operation, maintenance and renewal of all public water services, sewerage and stormwater drainage networks
- Ensure proper hazard management to prevent or minimise flooding and erosion
- Minimise adverse effects on the local environment particularly freshwater ecological systems and beach water quality, and assists in maintaining receiving water quality
- Ensure that watercourses are properly maintained
- Ensure protection of Council's water services, sewerage and stormwater drainage assets and the health and safety of employees
- Set out acceptable types of connection to public water services, sewerage and stormwater networks.

4.9 KEY STAKEHOLDERS

In addition to the general public, there are a number of key stakeholders who have an important role in the planning and delivery of service standards for the District's Water network. These organisations were approached directly during the AMP development process to obtain feedback on the current and desired levels of service. They included:

External

- Council's water maintenance contractor (Veolia Water)
- Waikato Regional Council
- Ministry of Health
- Ministry for the Environment
- Fish and Game
- Ngati Maniapoto
- Residential and commercial users
- NZ Fire Service

Internal

- Councilors
- Chief Executive
- Asset Group Manager and staff
- Finance Manager
- Corporate Group Manager
- Information Technology Manager
- Customer Services Staff

4.10 LINKS TO PLANNING DOCUMENTS

The key internal planning document influencing this AMP is the Council's 2018 – 2028 Long term Plan (LTP) which sets out Council's role in maintaining and promoting community well-being in the district. The AMP is a "tactical" plan in support of the Council's LTP, with linkages to the Council's District Plan, Structure Plans and Council bylaws pertaining to water related matters.

The following table summarises the linkages between AMP's and the other key components of the strategic planning and management of Council:

Long Term Plan	The broad strategic direction of Council set in the context of current and future customer requirements, many of which relate to the performance and financial requirements of the assets which are the subject of AM planning. The Activity Management Plan is the means for developing appropriate strategies and policies for the long-term management of Council's assets, and the basis for analysing the impact of Corporate strategic options on levels of service and long term funding needs.
Annual Plan	The Annual Plan is an annual installment of the LTP. The service level options and associated costs developed in the Activity Management Plan are fed into the Annual Plan consultation process.
District Plan	The District Plan regulates the shape and form of sustainable land use and activities pertinent to achievement of the District's environmental outcomes. It identifies and protects anticipated growth areas and formalises urban supply boundaries for utility services. It establishes standards for the construction and protection of the roading network and provides the mechanism for mitigating adverse effects on the natural and physical environment.
Financial Strategy:	Financial plans developed in each AMP are consolidated into the financial strategy of Council. AM plans improve financial planning by instigating planned long term maintenance and operating programmes and provide justification for works programmes and levels of funding.
Infrastructure Strategy	In addition to informing the 2018 -28 LTP, this AMP provides the asset management basis for WDC's Infrastructure Strategy in accordance with s.101B of the Local Government Act 2002.The financial projections in Section 10 of the AMP therefore include indicative values for a 30-year term in keeping with the statutory term of the Infrastructure Strategy. The Water AMP informs the content of WDC's Infrastructure Strategy by considering levels of service, life cycle asset management programmes and risk and resilience of the infrastructure.
Business Plans	The service levels and budgets defined in an AM plans are incorporated into Business Plans as performance measures for each department and individuals.
Contracts	The service levels, strategies and information requirements contained in the AMP become the basis for performance orientated Contracts let for service delivery
Corporate Information	Quality activity management is dependent on suitable information and data. This requires the availability of sophisticated AM systems which are fully integrated with the wider corporate information systems (e.g. financial, property, GIS, customer service, etc.).
Community Development Plan	Community development relies on essential infrastructure to underpin economic, environmental and social wellbeing.

The Water Supply AMP has synergies with a number of other Council AMPs. For example, the wastewater network is pivotal in collecting, treating and disposing of liquid wastes following human and industrial water consumption. Similarly, the roading network provides the corridor for hosting many underground infrastructural services such as the water reticulation.

At an external level, this AMP is consistent with Waikato Regional Council's Regional Plan – Water Module. This will have an increasing impact on minimum levels of service over time, particularly in relation to water take standards.

At an internal level, future work on Council's growth strategy followed by the review of its District Plan (commencing 2017) and the preparation of structure plans for its urban communities will help define the area boundaries for current and future water supply services.

4.11 ASSET MANAGEMENT POLICY & STRATEGY

The asset management policies and strategies guide and integrate AM practice for urban wastewater activities within WDC.

4.11.1 AM Policy

The current asset management policy states:

- Asset management practices will be focused on achievement of Council's Vision as stated in its 2018-28 Long Term Plan
- Asset management will be applied to the long term stewardship of assets, over a minimum planning horizon of 30 years, consistent with WDC's Infrastructure Strategy (note that the LTP planning horizon is 10 years)
- Asset management will be focused on delivering the agreed levels of service to existing and future customers in the most cost-effective way
- Relevant legislation, regulatory and statutory requirements will be complied with
- A robust risk management approach consistent with good AM practice will underpin all asset management activities
- Asset management processes will be endorsed by senior management and the Council
- The outputs of asset management processes will be used to inform preparation of WDC's long term plan and annual plans, for each group of activity, in accordance with Schedule 10 of the Local Government Act 2002, and WDC's Infrastructure Strategy in accordance with section 101B of the Local Government Act 2002.
- AMPs will be communicated to relevant staff and third parties to ensure they are aware of their asset management responsibilities
- Asset management plans will be accessible by all stakeholders and other interested parties
- Asset management plans will be reviewed three - yearly to ensure they remain relevant and consistent with the operative LTP
- WDC commits to the continuous improvement of asset management practices to achieve better alignment between the quality of asset management planning and decision making and the nature and scale of Council's assets and activities.

4.11.2 AM Strategy

The asset management strategy for giving effect to the AM policy is as follows:

- Levels of Service: To maintain current levels of service, with specific, minor variations by exception, and to formally review levels of service at least once every three years.
  (Note: Engagement with the community on satisfaction with the levels of service provided and improvements desired will be undertaken periodically. Consultation on options will be undertaken for specific, significant projects. The level of service review will inform the levels of service adopted by the Council.)
- Demand Forecast and Planning: To invest in works for growth in a timely way. Demand forecasts will be reviewed annually based on analysis of population and economic growth projections, social and demographic data, technological advances and other relevant data.
  Demand management options will also be considered when planning to meet growth to enhance sustainability of asset capacity and natural resources and to ensure projects qualify for any external financial assistance.
- Asset Service Potential: To maintain the current service potential of the asset through an appropriate level of maintenance and renewal works.
- Risk Management and Resilience: To manage risk exposure through:
  - Undertaking performance and condition monitoring of critical assets
  - Assessing resilience of critical assets to natural hazards
  - Identifying and managing risks relating to natural hazards and preparing programmes to address those risks.
- Optimises Decision Making: Undertake economic analysis for significant decisions related to optimisation and prioritisation of projects required to mitigate unacceptable risks.

- Measure Operational Performance: Ensure service agreements with contractors contain performance measures consistent with the AMP and Activity KPIs to achieve alignment from operational level to the LTP.

- Maintain and Improve Information Systems: To ensure data collection programmes (condition, asset performance, registers and performance management) are closely aligned to the nature and scale of the assets and to track achievement of service targets. Asset management system functionality will be progressively developed to meet the requirements of advanced asset management planning.

- Organisational Development: To develop organisational asset management capability for effective asset management techniques.

- Regular Review: To develop the AMP as a 'living' document, reviewed on a three-yearly basis, to ensure alignment with WDC's formal LTP planning processes and submit AMPs for formal adoption by the Council.

- Continuous Improvement: To improve AM practices, processes, data, systems and plans in accordance with the AM improvement plan, and review annually.

- Monitoring of levels of service performance measures: Monitor performance measures on a quarterly basis and report to management team.

4.12 STRATEGIC ASSESSMENT

SCHEME	ISSUE	EVIDENCE	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
Te Kuiti	Resource consent expiry date within term of AMP.	Surface take consent expires 30 September 2040.	The next consent application will need to be lodged with Waikato regional Council no later than 30 March 2040. Additional operating budget for technical advice and consultation in support of the application will be required over 2038 – 39. Budget estimate $200,000.	Vibrant communities.
	Capacity limitations	The previous water take consent allowed a take of 6,000m3/d/. It expired on 31 January 2015. The new consent is for 4,800m3/d. Current average demand is 3,035m^3/d. Peak demand is currently 4,688m^3/d. Treatment plant design capacity is 6,300m^3/d.	Investigations and test drilling into an alternative water source have been proposed for the 2018-28 LTP at an estimated cost of $50,000 pa over 2018/19 – 2020/21, plus $100,000 for construction of a production bore in 2021/22.	Sustainable infrastructure.
	Supply resilience	Te Kuiti relies on a single source supply. There are no other known water supply sources. The supply catchment is vulnerable to land slippage, leading to potential loss of supply for extended periods during dry summer periods, when demand is greatest.	Investigations and test drilling into an alternative water source have been proposed for the 2018-28 LTP at an estimated cost of $50,000 pa over 2018/19 – 2020/21, plus $100,000 for construction of a production bore in	Sustainable infrastructure.

SCHEME	ISSUE	EVIDENCE	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
		The raw water intake is located downstream from an established industrial area with an associated sewage pumping station.	2021/22.	
	Treated water storage	Current treated water storage comprises four reservoirs, each serving independent zones. Each is approximately 40 years old.	Seismic strengthening to be provided. $22,000 p.a. 2018/19-2020/23. Additional 3,000m^3 storage reservoir to be provided in 2029/30. Budget estimate $1.5M.	Sustainable infrastructure.
	Cosmetic issues.	Colour, taste and odour reflect the presence of residual iron and manganese concentrations in the reticulation.	Introduction of carbon dosing.	Vibrant communities.
	Pipe age and condition	Reticulation is approaching end of life. Sections of the network are in a relatively poor condition, as is evident from the high incidence of unaccounted for water.	An average annual programme of approximately $120,000 per year is required.	Sustainable infrastructure.
	Back flow prevention	The 2009 Water Safety Plan identified the risk of supply contamination due to the absence of back flow preventers at each point of supply.	An annual programme is in place to progressively install back-flow preventers across the network. Budget $42,000 per year over next seven years (2018/19 – 2025/26).	Vibrant communities.
Piopio	Resource consent.	The resource consent for the Piopio water supply take expires within the planning period, (1 August 2023). The consent provides for 450m^3 per day.	The next consent renewal application will need to be made by 1 Feb 2023.	Vibrant communities.
	Capacity limitations.	The current average take is 307m^3/day with a peak demand of 527m^3/d. The treatment plant has a design capacity of 600 m^3/d.	Demand management and conservation programmes.	
	Pressure fluctuations	Distribution operates on a direct supply method i.e. the water is pumped into the reticulation for use and the excess goes to the reservoir. When the reservoir is full, the treatment plant, including the main pumps, switches off. One effect of this method is that there can be significant pressure fluctuations in the network. The associated, recurring, pressure variations can shorten the lives of the affected assets, and private fittings.	A separate, direct rising main from the treatment plant to the reservoir is proposed for 2018/19.	Sustainable infrastructure.

SCHEME	ISSUE	EVIDENCE	PROGRAMME IMPLICATIONS	COMMUNITY OUTCOME LINKAGE
	Resilience	An earthquake resilience study completed in 2015/16 found that the Piopio reservoir is susceptible to earthquake damage.	A new reservoir is being designed for placement on the same land, belonging to WDC, and will have the same storage volume. Planned for 2018/2019. Est. cost $250,000.	Sustainable infrastructure.

Water supply operational, renewal and capital costs corresponding to the 2018-28 LTP period (inflated figures) covered by this AMP can be found in **Appendix D**.

The following notes apply to the expenditure forecasts:

- No significant increase in overhead costs will occur during the 2018-2048 planning period.
- Operational costs will increase in line with higher environmental standards over time, coincident with future consent renewal dates.
- It is assumed that there will be a gradual but continual increase in operation and maintenance expenditure in real terms over the planned period due to the continued ageing of the assets. A small part may be offset by improved asset management decision making made possible by enhanced information used in asset management systems
- Improved asset renewal decision making is expected to reduce maintenance costs made possible by enhanced information used in the asset management system which should help to slow the rise in operating cost. As this reduction is difficult to quantify, it has been assumed that the net effect will be neutral and has not been provided for in the financial forecast
- There will be no additional assets vested in Council from sub divisional development over the term of the AMP. This assumption will be reviewed in the next 3 year planning cycle
- Maintenance allocations are based on maintaining current levels of service including compliance with current resource consents
- Significant increases in the renewal funding may result from more detailed evaluation of asset condition.
- Growth in the size of existing water supply schemes will be minor over the term of the plan
- Changes in the district population will not impact on the expenditure forecasts for any of the water supply schemes over the 2018-48 period
- Resource consents required for any planned water supply project will not result in any material delay or additional capital expenditure
- No allowance has been made for any costs associated with the Waitomo Village water supply scheme in this AMP.

In summary the overall proposed Water Supply Activity forecast for the next 10 years contains the following features:

- Total projected operating and maintenance cost (excluding inflation) is approximately $16M over the 2018 – 2028 LTP period.
- Renewals: reticulation renewals in Te Kuiti of $1.2M is forecast over the next 10 years.
- To address this Council has settled on an average renewal programme of $120,000 per year for the 2018 -2028 period
- Capital works:
- No provision has been made for new water supply schemes in support of potential growth concepts proposed for Mokau – Awakino, Te Waitere, or Waitomo Village
- These projections and the AMP will be reviewed in 2020/21 ahead of the 2021-31 LTP in light of updated asset information that will be collected and recorded over the next 2.5 years.

4.13 FUNDING SOURCES

Current funding sources available for the water supply activity include:

Rates: Council's LTP includes full details of its Revenue and Financing Policy. In so far as the Water Supply Activity is concerned, the cost of the activity, including extraction, treatment and reticulation, is funded by way of a targeted uniform annual charge (TUAC), differentiated by supply area, and levied on each separately used or inhabited part of a rating unit.

Any rating unit fitted with a water supply meter, or defined as an extraordinary user, is charged a fixed rate per cubic metre of water consumed.

Council also operates an Assistance for Smaller Communities policy. Under this policy, all rating units in the district make a contribution towards the funding of eligible rural water supply services when the cost per connection exceeds $1400 including GST per separate inhabitable unit. The policy trigger point is reviewable every three years in line with the LTP process.

Financial/development contributions: Council has two different policy tools available to it under the LGA 2002 that can be used to fund the capital cost of new assets or additional asset capacity included in the Long Term Plan as a result of growth. A financial contributions policy prepared in accordance with the Resource Management Act 1991 allows Council to charge developers financial contributions while the LGA 2002 prescribes the process under which Council may establish a policy to charge development contributions. One or other, or a combination of both, can be used as a source of funding for growth related capital expenditure. However, "double dipping" of contributions is not permitted.

Financial contributions can be applied as an appealable condition of a resource consent, corresponding to work required to mitigate an adverse effect of a development on existing infrastructure or the environment. The financial contributions policy contained in Council's operative District Plan allows financial contributions to be charged where necessary, but remains untested. This stance reflects an unwritten philosophy of supporting economic development. Ironically, the need for growth related expenditure remains with or without a formal development/financial contributions policy, but at the expense of existing ratepayers.

Council has chosen to not adopt a Development Contributions policy, essentially because of the same philosophy, and because there is little or no growth related capital expenditure included in the 2018-28 LTP that would be eligible for development contributions.

SECTION 11 - ASSUMPTIONS

The following basic assumptions have been made in preparing the 30 year expenditure forecasts contained in this AMP:

	No.	Assumption	Level of Uncertainty	Impact on Integrity of LTP
GLOBAL IMPACT	1	The impacts of climate change and natural hazards will be minimal over the LTP planning period.	Medium	Low
	2	That the impact of technological change or disruption will not adversely affect Councils ability to deliver services.	Low - Medium	Low
NATIONAL IMPACT	3	Actual rates of inflation will be within the range tabulated.	Low	Low
	4	NZ Transport Agency financial assistance rates will continue at the levels set out by NZTA.	Low	Medium
	5	The average annual interest cost on borrowings will be 5.5% over the first 3 years and 6.0% over years 4 to 10.	Medium	Low
	6	Impact of Central Government changes to policy or legislation on local government income or expenditure.	Medium - High	Medium - High
	7	Government funding will continue at current levels.	Low	Low
WDC IMPACT	8	The impact of population change has been adequately provided for in the financial estimates.	Low	Low
	9	The impacts of societal changes and population structure have been adequately provided for in the financial estimates.	Low	Low
	10	The annual return on investments is assessed at zero for year 1, $350k for year 2 and thereafter increasing by $50k per annum over the remaining period.	Medium	Low
	11	The risk of Council's investment portfolio and inability to borrow is minimal.	Low	Low
	12	Resource consent acquisition and compliance processes are within estimated timeframes and expenditure estimates.	Low	Low
	13	The size of the rating base will not increase.	Low	Low
	14	The two major users of water and trade waste services will continue to operate within the district.	Low	Low
	15	Impact of transfer of significant Council assets will be minor.	Low	Low
	16	Changes to the scale of Council's asset inventory will be minor.	Low	Low
	17	Change in value of assets due to periodic revaluation will be in line with inflation.	Low	Low
	18	Assumed lives for Council's assets will have minimum impact on financial estimates.	Low	Low
	19	Depreciation reserves and subsidies will generally be adequate to fund asset renewal expenditure.	Low	Low
	20	The impact of growth related capital expenditure will be offset by revenue.	Low	Low

- NB: All assumptions whether specifically stated or otherwise are aligned with the LTP Forecasting Assumptions.

These assumptions and the AMP will be reviewed in 2020 in light of improved asset information that will be collected and recorded over the next 3 years ahead of the 2021-31 LTP.

SECTION 12 - PLAN IMPROVEMENT AND MONITORING

12.1 INTRODUCTION

Activity management planning embraces a process of constant improvement. The following table summarises the proposed actions and timetables for improving accuracy and confidence in the Water Supply AMP. It identifies and prioritises what needs to be done, who is going to do it and when it is to be completed by. Many of the steps will entail additional resourcing.

12.2 IMPROVEMENT PLAN

Ref	Description	Relative Priority				Target Completion Date	Additional External Resources Required	Actual Completion Date	Comment
		1	2	3	4				
1	Consultation to ascertain the water supply communities service needs and preferences and to ensure their views are considered when selecting the best level of service scenario.		x			Next review due August 2018	Survey consultant		Requires incremental improvement and updating of current knowledge only
2	Ensure the right level of funding is being allocated to maintain the asset service potential.		x			Ongoing			Monitor
3	Implement predictive modeling techniques that will allow consideration of alternative long term cost scenarios.			x		2019			Requires evaluation of appropriate AMS after inventory records updated and complete. with analysis of findings and implementation over the next 3-5 years
4	Improve standard of maintenance data integration with spatial data in Bizze@sset.	x				Ongoing			Monitor
5	Improve standard of contractor collection and reporting of maintenance data and integration of information with spatial data in Bizze@sset		X			Ongoing			Monitor continuous improvement
6	Initiate a long term zonal metering and leak detection programme, initially for Te Kuiti.			x		On-going			Commenced in ad hoc way from 2008.
7	Spare				x	2025-45			
8	Renew supply main from Mokau to Awakino		x			2018-28			
9	Develop accurate and complete asset inventory registers for each scheme.			x		Ongoing			On-going upgrade and improvement

Ref	Description	Relative Priority				Target Completion Date	Additional External Resources Required	Actual Completion Date	Comment
		1	2	3	4				
10	Develop a greater focus on risk identification and management for critical assets.			x		Ongoing			
11	Prioritise the works developed from the risk assessment exercise.			x					
12	Construct additional treated storage at Te Kuiti to meet 24 hours demand			x		2029/30			
13	Evaluate groundwater test bores as a potential auxiliary source for Te Kuiti water supply.				x	2018/19			.
14	Investigate and install SCADA and telemetry for automated monitoring and control of Mokau treatment and pumping/storage for compliance with MOH gradings and improved risk management.		x			2019/20			
15	Improve definition of standards for maintenance		x			Ongoing			Monitor
16	Review pump station and treatment plant maintenance programmes		x			Ongoing			Monitor
17	Update and implement water treatment plant operating procedures		X			Ongoing as plants get upgraded			Monitor
18	Collect further condition rating data for pipe networks and use to prioritise renewals programme.		X			Ongoing			Ongoing programme
19	Review and improve the financial information outlined in Section 10 and produce an updated financial forecast by 30 June each year		X			March each year			
20	Assess all water services available within the District in accordance with s.125 of the Local Government Act 2002.				x	June 2023			Last completed in 2014. Assessments consistent with provisions in Draft 2018 – 28 LTP
21	Link pipeline node assets to neighbouring pipe on asset data base.			X		June 2018			Next valuation due as at 30 June 2018.
22	Develop a plant asset hierarchy to allow for standardised unit rates and base lives			X		June 2018			Next valuation due as at 30 June 2018.

Ref	Description	Relative Priority				Target Completion Date	Additional External Resources Required	Actual Completion Date	Comment
		1	2	3	4				
23	Investigate plant asset types shown as 'unknown" in the plant valuation and confirm asset detail			**X**		June 2018			Missing asset details need to be identified and uploaded into AMS. Next valuation due as at 30 June 2018.

Key:
1 = High importance/high urgently
2 = High importance/low urgency
3 = Low importance/high urgency
4 = Low importance/low urgency

SECTION 13 - REFERENCES AND ACKNOWLEDGEMENTS

Material from the following documents has been used in the preparation of this Water Asset Management Plan:

- Water Safety Plans for WDC's four water schemes
- Water Services Assessment – Opus International Consultants 2014
- Waikato Regional Plan (part)
- Resident Satisfaction Survey, May 2009 -2017

SECTION 14 - APPENDICES

TITLE	
APPENDIX A:	GLOSSARY
APPENDIX B:	EXTRACT – SCHEDULE 10, LOCAL GOVERNMENT ACT 2002 – S.101B INFRASTRUCTURE STRATEGY
APPENDIX C:	WATER SUPPLY RISK ASSESSMENT
APPENDIX D:	FORECAST WATER SUPPLY EXPENDITURE 2018-48
APPENDIX E:	INDICATIVE SUMMARY RENEWAL PROGRAMME DETAIL 2018 – 2048
APPENDIX F:	TE KUITI ASSET TABLE
APPENDIX G:	PIOPIO ASSET TABLE
APPENDIX H:	MOKAU ASSET TABLE
APPENDIX I:	BENNEYDALE ASSET TABLE
APPENDIX J:	EFFECTIVE LIVES OF WATER SUPPLY ASSETS
APPENDIX K:	EXTRACT FROM WAIKATO REGIONAL COUNCIL PLAN VARIATION – WATER ALLOCATION
APPENDIX L:	SMART WATER USE CAMPAIGN

APPENDIX A: GLOSSARY

The following terms and acronyms (in brackets) are used in this AM plan:

Activity	An activity is the work undertaken on an asset or group of assets to achieve a desired outcome.
Advanced Activity Management (AAM)	Activity Management practice that has evolved to a state that matches business needs. AAM employs predictive modelling, risk management and optimised renewal decision making techniques to establish asset lifecycle treatment options and related long term cash flow predictions. (See Core Activity Management).
Annual plan	The Annual Plan provides a statement of the direction of Council and ensures consistency and coordination in both making policies and decisions concerning the use of Council resources. It is a reference document for monitoring and measuring performance for the community as well as the Council itself.
Asset	A physical component of a facility which has value, enables services to be provided and has an economic life of greater than 12months.
Activity Management (AM)	The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost effective manner.
Activity Management system (AMS)	A system (usually computerised) for collecting analysing and reporting data on the utilisation, performance, lifecycle management and funding of existing assets.
Activity Management Plan	A plan developed for the management of one or more infrastructure assets that combines multidisciplinary management techniques (including technical and financial) over the lifecycle of the asset in the most cost effective manner to provide a specified level of service. A significant component of the plan is a long term cash flow projection for the activities.
Activity Management strategy	A strategy for Activity Management covering, the development and implementation of plans and programs for asset creation, operation, maintenance, renewal, disposal and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.
Asset register	A record of asset information considered worthy of separate identification including inventory, historical, financial, condition, construction, technical and financial information about each.
Benefit cost ratio (B/C)	The sum of the present values of all benefits (including residual value, if any) over a specified period, or the life cycle of the asset or facility, divided by the sum of the present value of all costs.
Berm	The area of a road reserve between the kerb or surface water channel and property boundary exclusive of footpath.
Capital expenditure (CAPEX)	Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential. CAPEX increases the value of an asset.
Cash flow	The stream of costs and/or benefits over time resulting from a project investment or ownership of an asset.
Components	Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.
Condition monitoring	Continuous or periodic inspection, assessment, measurement and interpretation of resulting data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action
Core Activity Management	Activity Management which relies primarily on the use of an

	asset register, maintenance history, condition assessment, defined levels of service, and simple risk and benefit/ cost assessments in order to establish work priorities and long term cash flow predictions.
Critical assets	Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Current replacement cost	The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate modern equivalent asset.
Deferred maintenance	The shortfall in rehabilitation work required to maintain the service potential of an asset.
Demand management	The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.
Depreciated replacement cost (DRC)	The replacement cost of an existing asset after deducting an allowance for wear or consumption to reflect the remaining economic life of the existing asset.
Depreciation	The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes. It is accounted for by the allocation of the historical cost (or revalued amount) of the asset less its residual value over its useful life.
Disposal	Activities necessary to dispose of decommissioned assets.
Economic life	The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life however obsolescence will often ensure that the economic life is less than the physical life.
Geographic information system (GIS)	Software which provides a means of spatially viewing, searching, manipulating, and analysing an electronic data-base.
Infrastructure assets	Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components. The network may include normally recognised 'ordinary' assets as components.
Level of service	The defined service quality for a particular activity (i.e. roading) or service area (i.e. street-lighting) against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life	A measure of the anticipated life of an asset or component; such as time, number of cycles, distance intervals etc.
Life cycle	Life cycle has two meanings: (a) The cycle of activities that an asset (or facility) goes through while it retains an identity as a particular asset i.e. from planning and design to decommissioning or disposal. (b) The period of time between a selected date and the last year over which the criteria (e.g. costs) relating to a decision or alternative under study will be assessed.
Life cycle cost	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.

Maintenance	All actions necessary for retaining an asset as near as practicable to its original condition, but excluding rehabilitation or renewal.
Maintenance plan	Collated information, policies and procedures for the optimum maintenance of an asset, or group of assets.
Maintenance standards	The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.
Net present value (NPV)	The value of an asset to the organisation, derived from the continued use and subsequent disposal in present monetary values. It is the net amount of discounted total cash inflows arising from the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.
NIMT	North Island Main Trunk rail line
Objective	An objective is a general statement of intention relating to a specific output or activity. They are longer term aims and are not necessarily outcomes that managers can control.
Operation	The active process of utilising an asset which will consume resources such as manpower, energy, chemicals and materials. Operation costs are part of an assets life cycle costs..
Optimised renewal decision making (ORDM)	An optimisation process for considering and prioritising all options to rectify performance failures of assets. The process encompasses NPV analysis and risk assessment.
Performance indicator (PI)	A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.
Performance monitoring	Continuous or periodic quantitative and qualitative assessments of the actual performance compared with specific objectives, targets or standards.
Planned maintenance	Planned maintenance activities fall into 3 categories : (a) Periodic - necessary to ensure the reliability or sustain the design life of an asset. (b) Predictive – condition monitoring activities used to predict failure.
	(c) Preventive - maintenance that can be initiated without routine or continuous checking (e.g. using information contained in maintenance manuals or manufacturers' recommendations) and is not condition-based.
Rehabilitation	Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset using available techniques and standards to deliver its original level of service (i.e. heavy patching of roads, slip-lining of stormwater mains, etc.) without resorting to significant upgrading or replacement.
Renewal	Works to upgrade, refurbish, rehabilitate or replace existing facilities with facilities of equivalent capacity or performance capability.
Repair	Action to restore an item to its previous condition after failure or damage.
Replacement	The complete replacement of an asset that has reached the end of its life, so as to provide a similar or agreed alternative, level of service.

Remaining economic life	The time remaining until an asset ceases to provide service level or economic usefulness.
Risk cost	The assessed annual cost or benefit relating to the consequence of an event. Risk cost equals the costs relating to the event multiplied by the probability of the event occurring.
Risk management	The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.
Routine maintenance	Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative maintenance.
Service potential	The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset.
Strategic plan	Strategic planning involves making decisions about the long term goals and strategies of an organisation. Strategic plans have a strong external focus, cover major portions of the organization and identify major targets, actions and resource allocations relating to the long term survival, value and growth of the organisation.
Unplanned maintenance	Corrective work required in the short term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.
Traffic volume	The number of vehicles flowing in both directions past a particular part in a given time (for example, vehicles per hour or vehicles per day).
Upgrading	The replacement of an asset or addition/ replacement of an asset component which materially improves the original service potential of the asset.
Valuation	Estimated asset value which may depend on the purpose for which the valuation is required, i.e. replacement value for determining maintenance and replacement levels, or market value for life cycle costing.

APPENDIX B: EXTRACT – SCHEDULE 10, LOCAL GOVERNMENT ACT 2002 – S.101B INFRASTRUCTURE STRATEGY

- A local authority must, as part of its long-term plan, prepare and adopt an infrastructure strategy for a period of at least 30 consecutive financial years.

(2) The purpose of the infrastructure strategy is to—

- (a) identify significant infrastructure issues for the local authority over the period covered by the strategy; and
- (b) identify the principal options for managing those issues and the implications of those options.

(3) The infrastructure strategy must outline how the local authority intends to manage its infrastructure assets, taking into account the need to—

- (a) renew or replace existing assets; and
- (b) respond to growth or decline in the demand for services reliant on those assets; and
- (c) allow for planned increases or decreases in levels of service provided through those assets; and
- (d) maintain or improve public health and environmental outcomes or mitigate adverse effects on them; and
- (e) provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks.

(4) The infrastructure strategy must outline the most likely scenario for the management of the local authority's infrastructure assets over the period of the strategy and, in that context, must—

- (a) show indicative estimates of the projected capital and operating expenditure associated with the management of those assets—
  - (i) in each of the first 10 years covered by the strategy; and
  - (ii) in each subsequent period of 5 years covered by the strategy; and
- (b) identify—
  - (i) the significant decisions about capital expenditure the local authority expects it will be required to make; and
  - (ii) when the local authority expects those decisions will be required; and
  - (iii) for each decision, the principal options the local authority expects to have to consider; and
  - (iv) the approximate scale or extent of the costs associated with each decision; and
- (c) include the following assumptions on which the scenario is based:
  - (i) the assumptions of the local authority about the life cycle of significant infrastructure assets:
  - (ii) the assumptions of the local authority about growth or decline in the demand for relevant services:
  - (iii) the assumptions of the local authority about increases or decreases in relevant levels of service; and
- (d) if assumptions referred to in paragraph (c) involve a high level of uncertainty,—
  - (i) identify the nature of that uncertainty; and
  - (ii) include an outline of the potential effects of that uncertainty.

(5) A local authority may meet the requirements of section 101A and this section by adopting a single financial and infrastructure strategy document as part of its long-term plan.

(6) In this section, **infrastructure assets** includes—

- (a) existing or proposed assets to be used to provide services by or on behalf of the local authority in relation to the following groups of activities:
  - (i) water supply:

- (ii) sewerage and the treatment and disposal of sewage:
- (iii) stormwater drainage:
- (iv) flood protection and control works:
- (v) the provision of roads and footpaths; and

- (b) any other assets that the local authority, in its discretion, wishes to include in the strategy.

Section 101B: inserted, on 8 August 2014, by section 36 of the Local Government Act 2002 Amendment Act 2014 (2014 No 55).

APPENDIX C: WATER SUPPLY RISK ASSESSMENT

Water Supply Risk - Headworks

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Contamination of Te Kuiti raw water with oil or other pollutant such as blue/green algae	Need to shut down WTP	**5**	4	Extreme	Locate intake source away from potential sources of contamination	Much reduced risk of WTP shutdown	**3**	1	High	A
Intakes blocked or damaged in storm	Insufficient supply to meet demand	**4**	6	High	Upgrade intakes to include auto screen cleaning, provide raw water storage, and/or provide treated water storage for 24 hrs average demand	No interruption to supply	**1**	1	Low	B
Te Kuiti Intake pumps fail	No supply	**3**	4	Moderate	Ensure routine maintenance of raw water pumps and electrical supply MCC	Much reduced risk of WTP shutdown	**2**	1	Low	C
No power supply to headworks for extended time period	No supply	**4**	4	High	Provide buried power supply and connection for mobile generator	Much reduced risk of WTP shutdown	**2**	1	Low	B
Insufficient summertime raw water supply for Mokau	Restricted consumption	**4**	5	High	Investigate and implement additional raw water source	No reduced level of service	**1**	2	Low	A
Mokau: Raw water storage dam/weir collapses	No supply to Benneydale	**4**	4	High	Monitor condition of dams & weirs. Any defects to be scheduled maintenance	Reduced risk of WTP shutdown	**2**	3	Low	B
Mokau: EQ damages intake and/or raw water supply main	No supply	**5**	3	Extreme	Check susceptibility to EQ damage and upgrade as necessary	Rest of water network may be affected by EQ	**4**	3	High	A
Benneydale: EQ damages intake and/or raw water supply main	No supply	**5**	3	Extreme	Check susceptibility to EQ damage and upgrade as necessary	Rest of water network may be affected by EQ	**4**	3	High	A

Water Supply Risk – Treatment Plant

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Sabotage	Water quality compromised	**5**	1	High	Ensure acceptable security fencing, locks and lighting at treatment plants	reduced opportunity	**5**	1	High	C
Power supply failure	Unable to treat water	**3**	4	Moderate	Provide connection for mobile generator at plants	minimal interruption	**2**	4	Low	B

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Chemicals not available	Unable to treat water	**3**	3	Moderate	Hold 2 months supply	Can treat water	**1**	2	Low	C
Giardia or Cryptosporidium breakthrough at Benneydale, Piopio and Mokau	Water quality compromised	**4**	7	Extreme	Install coagulation or microfiltration	Potable water supply	**1**	1	Low	A
EQ damages WTP	No supply	**5**	3	Extreme	Check susceptibility to EQ, provide raw water bypass with chlorination facility	Untreated water available	**1**	3	Low	A
Inability to meet peak demand at Te Kuiti due to high industrial consumption	Reduced level of service	**4**	5	High	Install onsite storage at meat processing plants	No reduced level of service	**1**	1	Low	A
Inability to meet peak demand at Mokau	Reduced level of service	**4**	10	Extreme	Increase capacity of WTP and vary resource consent	No reduced level of service	**1**	2	Low	A
WTP's not performing in accordance with MOH gradings	Reduced level of service	**3**	4	Moderate	Review and revise individual plant operating procedures, and install automated monitoring equipment	No reduced level of service	**2**	2	Low	C
Increasing requirements of NZ Drinking Water Standards	Unable to meet MOH gradings	**3**	9	High	Continuous improvement of WTP processes	No reduced level of service	**2**	2	Low	B

Water Supply Risk – Treated Water Storage

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Sabotage	Water quality compromised	**5**	1	High	Ensure acceptable security locks and remove external ladders from reservoirs	reduced opportunity	**5**	1	High	C
Broken inlet main empties reservoir(s)	Loss of supply	**4**	3	High	Modify inlets to prevent backflow where applicable	No loss of supply	**1**	1	Low	B
EQ destroys reservoir	Loss of supply	**4**	3	High	Increase seismic security of reservoirs	No loss of supply	**3**	1	Moderate	B

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Water quality compromised by birds or vermin	Water quality compromised	**3**	5	Moderate	Improve vermin and bird proofing	No reduced level of service	**1**	1	Low	B
Gravity main failure not detected until storage compromised	Loss of supply	**3**	4	Moderate	Install falling main break alarms with automatic shut off valves and SCADA alarms	No loss of supply	**1**	1	Low	C
Inadequate storage	Reduced level of service	**2**	4	Low	Construct additional storage	No reduced level of service	**1**	1	Low	C
Inlet or outlet connection shear in EQ	Loss of supply	**3**	3	Moderate	Improve seismic security of connections	No loss of supply	**2**	1	Low	C

Water Supply Risk – Trunk Mains and Pump Stations

Risk Description	Consequence		Likelihood	Risk Rating	Best Management Option	Consequence when managed		Likelihood	Managed Risk Rating	Action Plan
Pipe bridge failure	Loss of service	**3**	5	Moderate	Inspect and schedule maintenance of any defects	No loss of service	**2**	1	Low	C
Pumping main undersized	Increased energy use	**1**	4	Low	Review capacity of all pumping mains	Reduced operating costs	**1**	1	Low	D
Slip on Awakino hill	Broken/displaced pipeline	**2**	5	Moderate	Ensure spare fittings and pipe are available	Reduced loss of supply	**1**	5	Low	C
Water quality degrades in trunk mains	Water quality compromised	**2**	6	Moderate	Proactive flushing and scouring programme	No reduced level of service	**1**	1	Low	C
Mechanical failure in pump station	Dependent on location of station	**1**	4	Low	Review maintenance inspection of pumps and spares holdings	Reduced loss of supply	**1**	1	Low	D
Power failure	Dependent on location of station	**3**	5	Moderate	Provide connection for mobile generator at pump stations	Reduced loss of supply	**2**	5	Moderate	C
MCC failure	Dependent on location of station	**3**	4	Moderate	Review maintenance inspection of controls and spares holdings	Reduced loss of supply	**3**	1	Moderate	C

APPENDIX D: FORECAST WATER SUPPLY EXPENDITURE 2018-48

Inflated figures

Waste Water ($000's)	EAP 17/18	LTP Yr 1 18/19	LTP Yr 2 19/20	LTP Yr 3 20/21	LTP Yr 4 21/22	LTP Yr 5 22/23	LTP Yr 6 23/24	LTP Yr 7 24/25	LTP Yr 8 25/26	LTP Yr 9 26/27	LTP Yr 10 27/28
Operating Revenue											
Kerbside Collection	(134,480)	(136,800)	(140,220)	(143,366)	(146,786)	(150,343)	(154,174)	(158,004)	(162,245)	(166,759)	(171,410)
Kerbside Recycling	0	0	0	0	0	0	0	0	0	0	0
Landfill and Transfer Stations	(823,211)	(937,280)	(960,712)	(982,269)	(1,005,701)	(1,030,071)	(1,056,315)	(1,082,558)	(1,111,614)	(1,142,544)	(1,174,412)
Waste Minimisation	(35,000)	(36,000)	(36,900)	(37,728)	(38,628)	(39,564)	(40,572)	(41,580)	(42,696)	(43,884)	(45,108)
Transfer Stations	(6,148)	(9,300)	(9,533)	(9,746)	(9,979)	(10,221)	(10,481)	(10,742)	(11,030)	(11,337)	(11,653)
	(998,839)	**(1,119,380)**	**(1,147,365)**	**(1,173,110)**	**(1,201,095)**	**(1,230,199)**	**(1,261,541)**	**(1,292,884)**	**(1,327,585)**	**(1,364,524)**	**(1,402,583)**
Direct Expenditure											
Kerbside Collection	156,853	289,476	296,712	303,369	310,608	318,133	326,238	334,344	343,317	352,870	362,712
Kerbside Recycling	140,358	0	0	0	0	0	0	0	0	0	0
Landfill and Transfer Stations	730,434	820,423	973,479	1,006,784	1,010,888	1,032,141	1,054,458	1,068,211	1,083,196	1,119,185	1,126,070
Waste Minimisation	11,057	11,000	11,275	11,528	11,803	12,089	12,397	12,705	13,046	13,409	13,783
Transfer Stations	184,533	197,950	202,899	207,452	212,400	217,547	223,259	228,806	234,947	241,484	248,219
	1,223,235	**1,318,849**	**1,484,364**	**1,529,132**	**1,545,699**	**1,579,910**	**1,616,352**	**1,644,065**	**1,674,506**	**1,726,948**	**1,750,784**
Indirect Expenditure											
Allocated Costs	370,954	388,656	400,253	406,403	415,269	427,368	440,689	452,262	464,816	471,411	482,998
Depreciation	63,511	90,893	93,010	108,026	126,187	119,566	120,115	120,679	121,256	121,462	122,072
Interest	244,093	256,395	253,837	277,829	302,517	310,422	294,846	272,565	245,539	217,479	188,000
	678,558	**735,945**	**747,101**	**792,258**	**843,972**	**857,356**	**855,651**	**845,506**	**831,611**	**810,352**	**793,070**

Net Cost of Service	**902,954**	**935,414**	**1,084,100**	**1,148,280**	**1,188,576**	**1,207,067**	**1,210,462**	**1,196,687**	**1,178,532**	**1,172,776**	**1,141,271**
Capital Expenditure											
Kerbside Collection	0	0	0	0	0	0	0	0	0	0	0
Kerbside Recycling	0	0	0	0	0	0	0	0	0	0	0
Landfill and Transfer Stations	295,020	185,000	1,036,175	1,201,280	310,730	335,990	336,270	336,550	336,860	337,190	337,530
Waste Minimisation	0	0	0	0	0	0	0	0	0	0	0
Transfer Stations	21,089	32,000	9,533	9,746	4,829	5,495	5,635	5,775	5,930	6,095	6,265
	316,109	**217,000**	**1,045,708**	**1,211,026**	**315,559**	**341,485**	**341,905**	**342,325**	**342,790**	**343,285**	**343,795**
Net Expenditure	**1,219,063**	**1,152,414**	**2,129,808**	**2,359,307**	**1,504,135**	**1,548,552**	**1,552,367**	**1,539,012**	**1,521,322**	**1,516,061**	**1,485,066**
Funded By											
Reserves	(242,123)	(162,000)	(172,158)	(338,426)	(280,734)	(306,010)	(305,730)	(280,450)	(255,140)	(229,810)	(204,470)
Internal Loans	(220,020)	0	(775,925)	(838,400)	0	0	0	0	0	0	0
Total Rates	(756,919)	(990,414)	(1,181,725)	(1,182,480)	(1,223,401)	(1,242,542)	(1,246,637)	(1,258,562)	(1,266,182)	(1,286,251)	(1,280,596)
	(1,219,062)	**(1,152,414)**	**(2,129,808)**	**(2,359,307)**	**(1,504,135)**	**(1,548,552)**	**(1,552,367)**	**(1,539,012)**	**(1,521,322)**	**(1,516,061)**	**(1,485,066)**

APPENDIX E: INDICATIVE SUMMARY RENEWAL PROGRAMME DETAIL 2018 – 2048

Asset ID	Asset Type	Total Length (m)	Community	Total Optimised Replacement Cost	Total Depreciated Replacement Value	Average Age	Average Remaining Life	Total Replacement Cost
2015-16	Pipe Main	418.88	Te Kuiti	$56,025.20	$1,474.34	74	2	$56,025.20
2016-17	Pipe Main	544.30	Te Kuiti	$85,535.27	$2,669.83	60.8	2.4	$85,535.27
2017-18	Pipe Main	688.73	Te Kuiti	$85,364.87	$8,671.75	51	4.6	$85,364.87
2018-19	Pipe Main	503.99	Te Kuiti	$70,369.64	$8,511.72	51	7	$70,369.64
2019-20	Pipe Main	644.51	Te Kuiti	$96,202.93	$12,163.00	50.6	8	$96,202.93
2020-21	Pipe Main	304.35	Te Kuiti	$40,706.81	$7,753.68	34	8	$40,706.81
2021-22	Pipe Main	632.06	Te Kuiti	$84,575.75	$11,746.73	50.3	8	$84,575.75
2022-23	Pipe Main	509.50	Te Kuiti	$69,350.46	$9,733.39	49	8	$69,350.46
2023-24	Pipe Main	536.48	Te Kuiti	$77,140.35	$9,812.64	50.2	8	$77,140.35
2024-25	Pipe Main	471.22	Te Kuiti	$84,889.55	$10,139.43	55.7	8	$84,889.55
2025-30	Pipe Main	2187.22	Te Kuiti	$273,188.25	$54,369.95	45.7	9.6	$273,188.25
2030-35								$0.00
2035-40	Pipe Main	1762.35	Te Kuiti	$236,449.94	$87,149.38	41.1	24.4	$236,449.94
2040-45	Pipe Main	15434.11	Te Kuiti	$2,033,665.40	$839,695.98	41.0	29.0	$2,033,665.40
2045-50	Pipe Main	8510.99	Te Kuiti	$1,354,075.10	$686,231.07	34.6	35.4	$1,354,075.10
2050-55	Pipe Main	2324.93	Te Kuiti	$252,420.22	$161,573.83	26.8	38.6	$252,420.22
2055-60	Pipe Main	1656.64	Te Kuiti	$163,543.08	$112,452.34	17.2	42.8	$163,543.08
2060-65	Pipe Main	2364.90	Te Kuiti	$242,505.53	$173,653.00	14.7	48.9	$242,505.53
2065-70	Pipe Main	837.90	Te Kuiti	$87,647.67	$72,034.11	8.3	54.3	$87,647.67
2070-75	Pipe Main	99.36	Te Kuiti	$13,289.40	$11,580.76	9	61	$13,289.40
2075-80	Pipe Main	5258.40	Te Kuiti	$658,802.91	$603,651.39	7.2	65.5	$658,802.91
2080-85	Pipe Main	1485.67	Te Kuiti	$173,202.74	$137,289.71	15.1	67.6	$173,202.74
2085-90								$0.00
2090-95	Pipe Main	1650.64	Te Kuiti	$143,632.21	$97,172.67	41.7	77.7	$143,632.21

APPENDIX F: TE KUITI ASSET TABLE

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year installed	Age (Years)	Expected Economic Life
Headworks	Intake Structures	3	2	C	1973	44	50
	River Pump No 1	2	3	C	1997	20	25
	River Pump No 2	2	3	C	1997	20	25
	River Pump No 3	2	3	C	1997	20	25
	River Pump No 4 (Reconditioned 2007)	2	3	C	1997	20	25
	Raw Water Main Fittings	3	2	D	1973	44	65
	Raw water main Intake - Treatment Plant	2	2	D	1973	44	65
	Plant Inlet Magflow Meter	1	1	A	2007	10	15
Treatment Plant	Flashmixer	3	3	C	1973	44	50
	Flashmixer Support	4	3	D	1973	44	50
	Riser Pipework	1	1	A	2008	9	50
	Alum Dosing Tank	2	2	C	1995	22	50
	Alum Dosing pumps	1	4	C	1995	22	25
	Polyelectrolyte storage tank	2	2	A	1990	27	50
	Poly dosing tank	3	3	A	1999	18	15
	Poly dosing pumps	2	2	C	1999	18	15
	Coagulated Water Channels	3	3	C	1973	44	50
	Clarifiers (4)	3	3	B	1973	44	100
	Sludge extraction cones (4)	3	3	C	1993	24	20
	Sludge disposal plant	4	4	C	1973	44	50
	Clarifier walkways	4	4	C	1973	44	40
	Settled water pipelines	3	2	C	1973	44	50
	Rapid sand filters (4) (media and underdrains)	3	2	C	2000 - 2004	17 - 21	30
	Air Scour Plant	3	2	C	1973	44	45
	Backwash System	3	3	C	1960	57	70
	Clearwell valves and pipework – Filters 1 & 2	2	3	C	1973	44	50
	Clearwell valves and pipework – Filters 3 & 4	2	3	C	1973	44	50
	Caustic Soda Tank	1	2	B	1999	18	20
	Caustic dosing system	1	2	B	2004	13	15
	pH control system	1	1	A	2004	13	15
	Treatment Plant Building	4	3	D	1973	44	50
	Chlorination Building	2	1	C	1973	44	50
	Chlorination Plant	2	2	C	1995	22	25

	Treated Water Submersible Pump #1	2	2	C	2007	10	10
	Treated Water Submersible Pump # 2	2	2	C	2007	10	10
	Treated Water Submersible Pump # 3	2	2	C	2007	10	10
	Treated Water Submersible Pump # 4	2	2	C	2007`	10	10
	Contact Reservoir (903m3)	3	2	C	1960	57	100
	Pressure pump # 1 (review future need in light of new storage reservoir proposal)	3	2	D	1973	44	50
	Pressure pump # 2 (review future need in light of new storage reservoir proposal)	3	2	D	1973	44	50
	Pressure pump # 3 (review future need in light of new storage reservoir proposal) Recent refurbished	2	2	C	1960	57	60
	Pressure pump # 4 (review future need in light of new storage reservoir proposal)	4	2	C	1960	57	60
	Electrical Supply	1	1	A	2003	14	25
	MCC	1	1	A	2003	14	25
	Valves & Pipework	5	3	D	1973	44	50
	Site Security	2	3	C	1990	27	50
	Stairs & Handrails	4	5	C	1973	44	50
	Vehicle Access	2	4	C	1973	44	50
Storage	Awakino (Timber) (Proposal is to replace this and make redundant)	2	3	D	1979	38	50
	Hospital (Concrete)						
	– Tank	2	2	C	1951	66	100
	– Roof	3	2	D	1971	46	50
	– Ringbeam	2	2	C	1951	66	100
	– Pipework	3	3	D	1951	66	80
	– Access	5	4	C	1951	66	75
	Hetet (Concrete)						
	– Tank	3	2	C	1951	66	100
	– Roof	3	2	C	1971	46	50
	– Ringbeam	2	2	D	1951	66	100
	– Pipework	3	2	D	1951	66	80
	– Access	2	3	C	1951	66	75
	Mangarino (Concrete)						
	– Tank	3	1	D	1951	66	100
	– Roof	2	2	C	1971	46	50
	– Ringbeam	3	2	C	1951	66	100
	– Pipework	3	2	D	1951	66	80

	– Access	4	2	C	1951	66	75
Rata St Pump Station	Building Structure	3	3	C	1975	42	50
	– Doors	2	1	C	1999	18	30
	– Paintwork	3	1	C	1995	22	
	MCC	2	3	C	2006	11	25
	Pump Control	1	1	C	2001	16	25
	Pumps VRD2/2.5 End Suction Grundfos Centrifugal (2)	1	1	C	2006	11	25
	Lifting Equipment	3	%	C	1975		
	Pipework	2	2	C	1975	41	50
	Valves	3	2	C	1975	41	50
Tonga St Pump Station	Building Structure	3	3	C	1975	41	50
	– Doors	2	1	C	1999	18	30
	– Paintwork	1	1	C	1995		
	MCC	1	1	C	2006	11	25
	Pump Control	1	1	C	2006	11	25
	Pumps VRD2/2.5 End Suction Centrifugal (2)	1	1	C	2006	11	25
	Lifting Equipment	4	5	C	1975		
	Pipework	2	3	C	1975	41	50
	Valves	3	1	D	1975	41	50
Awakino Rd Booster Pump Station	Building Structure	2	2	C	1985	32	50
	– Access Hatch	2	3	A	1985	32	40
	– Paintwork	3	3	A	1985	32	30
	MCC	3	2	B	1985	32	35
	Pump Control	3	2	B	1985	32	35
	Pumps VRD2/2.5 End Suction Centrifugal (2)	4	3	B	1985	32	35
	Pipework	3	2	C	1985	32	50
	Valves	2	1	C	1985	32	50
Water Reticulation	Recorded in the Asset Management system	Recorded in the Asset Management system	Recorded in the Asset Management system	Recorded in the Asset Management system	Recorded in the Asset Management system	Recorded in the Asset Management system	Recorded in the Asset Management system
Fittings	Fire Hydrants Valves Flow Meters	3 - 1	1 - 1	D D A	Varies Varies 2007	 10	60 60 20

Asset Performance and Condition Grading

Note: Gradings: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Very Poor.
Confidence Gradings: A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

23 = indicative replacement date due within LTP planning period

23 = indicative replacement date overdue

APPENDIX G: PIOPIO ASSET TABLE

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year installed	Estimated Age in 2008 (years)	Expected Economic Life
Headworks	Floating Intake Pump	1	1	A	2004	13	25
	Raw Water main – Intake to Clarifier	3	2	A	1992	25	60
	Raw water trunk main fittings	3	2	A	1992	25	60
Treatment Plant	PACL coagulation contact tank	2	3	A	1992	25	60
	RC Horizontal Clarifier	2	3	A	1992	25	60
	Stairs & Handrails	1	1	A	2007	10	50
	Inlet / Outlet pipework	2	4	A	1992	25	35
	Sludge disposal pond	3	4	A	1992	25	35
	Turbidity meter	2	2	A	2010	7	10
	Chlorination plant	2	2	A	2010	7	30
	Chlorination pump	2	2	A	2010	7	30
	Pump Building	3	3	A	1975	42	50
	Distribution pump # 1	1	1	A	2004	13	25
	Distribution pump # 2	1	1	A	2004	13	25
	Boost pump pipework & fittings	1	1	A	2004	13	25
	Electrical Switchboard	1	1	A	2010	7	25
	Ventilation	4	1	A	2010	7	50
	Lighting	1	1	A	2010	7	35
	Access	1	1	A	2010	7	35
	Site Security	1	1	A	2010	7	10
	Vehicle Access	3	4	A	1992	25	50
Storage	25 m3 Plastic Tanks # 5	1	1	A	2010	7	25
Water Reticulation	Asbestos pipes	3	3	D	1977	40	50
	UPVC pipes	3	3	D	1987	31	80
Fittings	Fire Hydrants	3	3	D	1977	40	80
	Valves	3	3	D	1977	40	80

Asset Performance and Condition Grading - Piopio

Note: Gradings: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Very Poor

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APPENDIX H: MOKAU ASSET TABLE

Asset Type	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed	Estimated Age (years)	Expected Economic Life
Water Source	Storage Dam (Earthen)	3	3	A	1975	42	50
	Intake Structure	3	2	C	1975	42	50
	Raw water trunk main – Intake to Ridge top (AC)	3	2	B	1975	42	60
	Raw water trunk main – Ridge top to Treatment Plant (Steel)	4	3	B	1975	42	50
	Raw water trunk fittings	3	2	B	1975	42	50
Treatment Plant	Building				1975	42	50
	- Cladding (Colorsteel)	1	1	A	2007	10	40
	- Access	3	3	A	1973	44	50
	- Lighting	3	3	A	2003	14	25
	Bermad PRV	1	1	A	2003	14	25
	Absorption Clarifier	1	1	A	2003	14	50
	Clarifier Butterfly Valves	1	1	A	2003	14	50
	Pneumatic actuators	1	1	A	2003	14	25
	Backwash Tank	1	1	A	2003	14	25
	Inlet / Outlet Pipework	1	1	A	2003	14	25
	DE Filter	1	1	A	2003	14	25
	DE Recoating Pump	1	1	A	2003	14	25
	DE Butterfly Valves	1	1	A	2003	14	50
	Chlorination plant	2	2	A	1998	19	25
	Chlorination Pump	2	2	A	1998	19	25
	Flow Control valve & actuator	5	4	A	1998	19	25
	Electronic Flow Meter	2	2	A	2008	9	50
	Air Compressor	1	1	A	2004	13	25
	Contact Reservoir 225m3 (Ferro cement)	4	3	A	1973	44	100
	Stairs & handrails	4	4	A	1973	44	50
	Lab equipment	4	4	A	1998	20	50
	Electrical/Switchboard	2	1	A	2000	17	20
	Turbidity meters # - 2	2	2	A	2009	8	10
	Chlorine dosing pump	2	2	A	2009	8	10
	Ph meter	2	2	A	2009	8	10
Storage	Reservoir 225m3. (Timber)	5	5	A	1998	19	25
	3 Polyethylene Reservoirs	1	1	A		**14**	**15**
Reticulation Services	AC pipes						50
	uPVC pipes						80
	MDPE "Alkathene"						50
	Connections	-	-			varies	Varies
Fittings	Valves						60
	Hydrants						60
	Water meters (bulk)	-	-			varies	20

Asset Performance and Condition Grading - Mokau

Note: Gradings: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Very Poor
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23 = indicative replacement date overdue

APPENDIX I: BENNEYDALE ASSET TABLE

Asset	Asset Component	Condition Grading	Performance Grading	Condition Data Confidence	Year Installed	Estimated Age (years)	Expected Economic Life
Water Source	Upper Storage Dam / Weir (redundant)	NA	NA	A	1940	NA	NA
	Lower storage dam	1	1	A	2008	9	80
	Intake Structure	1	1	A	2008	9	50
	Raw water main: Intake to Treatment Plant	1	1	A	2008	9	80
	Raw water trunk fittings	2	2	A	1995 & 2008	22	50
Treatment Plant	Chlorination building	2	2	A	1994	23	50
	- Ventilation	2	2	A	1994	23	50
	- Access	1	1	A	2008	9	50
	- Lighting	1	1	A	2008	9	25
	Chlorination plant (Hypochlorite)	1	1	A	2002	15	20
	Chlorine analyzer	1	1	A	2008	9	15
	Sedimentation tanks	1	1	A	2004	13	15
	Absorption clarifier	1	1	A	2004	13	25
	Switchboard	1	1	A	2008	9	25
	1050 mm MH boost pump chamber	2	2	A	1994	23	80
	DE filter	1	1	A	2004	13	15
	Reservoir & Contact Tank ($90m^3$)	3	3	B	1940	77	80
	PE reservoirs	1	1	A	2004	13	15
	Flygt 3.5kW submersible pump	1	1	A	2008	9	15
	Vehicle Access	4	4	A	1940	77	80
	Site Security	4	4	A			
Reticulation	uPVC pipes	1	1	A	2008	9	100
	PE pipes	1	1	A	2008	9	100
	Concrete pipes						
Services Fittings	Connections	-	-			varies	varies
	Valves	1	1	A	2008	9	80
	Hydrants	1	1	A	2008	9	80

Asset Performance and Condition Grading - Benneydale

Note: Gradings 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Very Poor
Confidence Gradings: A = Highly Reliable, B = Reliable, C = Uncertain, D = Very uncertain

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APPENDIX J: EFFECTIVE LIVES OF WATER SUPPLY ASSETS

MATERIAL	EFFECTIVE LIFE	Lives- NZ Guidelines
AC	60	50 - 150
PVC	100	50 - 150
CI	80	50 - 150
CLS	100	50 - 150
GALV	60	50 - 150
CONC	70	50 - 150
PE	100	50 - 150
SF	100	50 - 150
ALK	70	50 - 150
Unknown	80	50 - 150
End cap	100	50 - 150
Fire hydrant	80	50 - 150
Toby	60	50 - 150
Valve	80	25 - 75
METER	30	10 - 35

PRODUCTION

ITEM	EFFECTIVE LIFE	Lives- NZ Guidelines
Cabinet	30	15 - 35
Chipseal Road	25	2 - 20
Concrete	100	75 - 100
Settling Pond	100	
Meter	25	
Telemetry	15	
Tank Liner	30	
Instrument	15	
Building	40	
Dam	100	75 - 100
Plastic tank	60	
Dosing Tanks	60	20 - 75
Electrical	25	15 - 30
Fencing	30	15 - 50
MechPlant	35	10 - 35
Pipework	80	50 - 100
ProcessPlant	25	10 - 35
Pump	25	10 - 35
Roading	20	2 - 20
Filter media	20	40 - 75
Stainless Steel	80	20 - 75
Steel	50	20 - 75
Timber	60	40 - 100

PRODUCTION

ITEM	EFFECTIVE LIFE	Lives- NZ Guidelines
Cabinet	30	15 - 35
Chipseal Road	25	2 - 20
Concrete	100	75 - 100
Settling Pond	100	
Meter	25	
Telemetry	15	
Tank Liner	30	
Instrument	15	
Building	40	
Dam	100	75 - 100
Plastic tank	60	
Dosing Tanks	60	20 - 75
Electrical	25	15 - 30
Fencing	30	15 - 50
MechPlant	35	10 - 35
Pipework	80	50 - 100
ProcessPlant	25	10 - 35
Pump	25	10 - 35
Roading	20	2 - 20
Filter media	20	40 - 75
Stainless Steel	80	20 - 75
Steel	50	20 - 75
Timber	60	40 - 100

APPENDIX K: EXTRACT FROM WAIKATO REGIONAL COUNCIL PLAN VARIATION – WATER ALLOCATION

Refer to link:
http://www.waikatoregion.govt.nz/PageFiles/7062/RPV6VOL3clean.pdf

APPENDIX L: SMART WATER USE CAMPAIGN

Smart Water Use

It is easy to take our fresh water for granted, but in the drier summer months we need to be particularly careful to conserve it. Residential water use, including garden watering, can put extra pressure on Council's water systems when supplies are at their lowest.

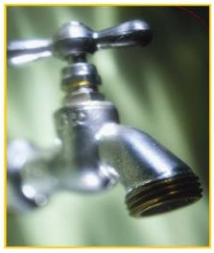
Waitomo District Council is taking part in the Smart Water Use campaign, to promote the careful use of water in our region. This year, the focus is on residential water use at home. There are lots of simple things we can do around home to conserve water.

Quick tips for smart water use...

Indoors:

- Do full loads in the clothes washer and dishwasher
- Promote shorter showers and shallower baths
- Don't run the water when brushing your teeth
- Fix a leaky toilet cistern or dripping tap as soon as possible
- Fill the sink to wash vegetables and rinse dishes

Did you know?
Twenty five percent of water use at home is for showers and baths, so big water savings can be made here. Time your shower, it may be longer than you think. Encourage shorter showers for everyone in the household.



Outdoors:

- **Water the garden in the early morning or evening to reduce evaporation.**
- **Use a broom instead of the hose to clean paths and driveways.**
- **Use a bucket to wash the car. Don't leave the tap running.**
- **Check taps, pipes and connections regularly for possible leaks.**

Did you know?
A swimming pool cover can cut evaporation by as much as 90%, reducing the need for top-ups in the dry summer season.

Water is a precious resource.
We can all do our part to conserve it.

smartwateruse™

Waitomo District Council